Lippincott Williams & Wilkins'

Dental Drug Reference

with Clinical Implications

CD-ROM with Printable Drug Monograph

Second Edition

Frieda Atherton Pickett, RDH, MS
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Antibiotic Prophylaxis for Dental Patients with Total Joint Replacement

Joint advisory statement of the American Dental Association and the American Academy of Orthopaedic Surgeons.

Table 1. Patients at Potential Increased Risk of Hematogenous Total Joint Infection*

PATIENT TYPE	CONDITION PLACING PATIENT AT RISK
All patients during first two years following joint replacement	Not applicable
Immunocompromised/immunosuppressed patients	Rheumatoid arthritis Systemic lupus erythematosus Drug or radiation-induced immunosuppression
Patients with comorbidities†	Previous prosthetic joint infections Malnourishment Hemophilia HIV infection Type 1 (insulin-dependent) diabetes Malignancy

*Based on Ching and colleagues,[1] Brause,[2] Murray and colleagues,[3] Poss and colleagues,[4] Jacobson and colleagues,[5] Johnson and Bannister,[6] Jacobson and colleagues[7] and Berbari and colleagues.[8]

†Conditions shown for patients in this category are examples only; there may be additional conditions that place such patients at risk of experiencing hematogenous total joint infection.

Table 2. Suggested Antibiotic Prophylaxis Regimens

PATIENT TYPE	SUGGESTED DRUG	REGIMEN
Patients not allergic to penicillin	Cephalexin, cephradrine, or amoxicillin	2 g orally 1 hr prior to the dental procedure
Patients not allergic to penicillin and unable to take oral medications	Cefazolin or ampicillin	Cefazolin or ampicillin 2 g IM or IV 1 hr prior to the dental procedure
Patients allergic to penicillin	Clindamycin	600 mg orally 1 hr prior to the dental procedure
Patients allergic to penicillin and unable to take oral medication	Clindamycin	600 mg IV 1 hr prior to the dental procedure

Advisory Statement from ADA and AAOS: Antibiotic prophylaxis for dental patients with total joint replacements, JADA 2003;134(7):895–899. Tables 1 and 3. Reprinted by permission of ADA Publishing.

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Preface

The second edition of *Lippincott Williams and Wilkins' Dental Drug Reference with Clinical Implications* is designed as a quick and concise pharmaceutical resource for dental professionals. This unique reference has been updated to deliver clinically relevant information to be used chairside during the review of a patient's medical history. In addition to providing data on the drugs encountered and used in dentistry, *LWW's Dental Drug Reference with Clinical Implication, Second Edition*, also serves as an up-to-date reference for the pharmacological management of orodental pain, oral infections, and common mucocutaneous conditions, and also presents a practical approach to relevant adverse drug events.

The text begins with a discussion of general principles of pharmacology and adverse drug events, an understanding of which is essential for the rational use of drugs in the prevention, diagnosis, and treatment of disease. Subsequent chapters provide insightful information related to the risk stratification and dental management of the patient taking medication for a variety of systemic diseases, concise information relevant to the management of odontogenic pain and infection, and a common sense approach to the potential medical emergencies one may encounter in the oral health care setting. Prescription examples can be found in the section on the medical management of selected oral conditions. Full-color clinical photographs of common mucocutaneous conditions and oral manifestations of adverse drug effects are included in an image insert at the back of the book.

The attached CD-ROM contains all of the drug monographs in a fully searchable format; drug monographs may also be printed and placed in the patient's chart.

Readers may receive continuing education credits for the personal study of the Clinical Medicine and Therapeutics chapters in Section 1. Refer to p. ii at the front of the text for additional details.

The A to Z Listing of Drugs provides information relevant to dentistry on over 3,700 trade and generic drugs. We have made every effort to include current, up-to-date information as it was available at the time of manuscript preparation. However, the user should be cautioned that therapeutic recommendations change as new drugs and new drug information becomes available.

The appendices present information that is not readily available in other reference sources but which may be helpful to the oral health care provider. This includes a Spanish-English translation guide, a list of herbal and nutritional supplements and how they may effect dental care, and product-specific information such as toothpastes that do not contain sodium laurel sulfate.

Our goal in revising *LWW's Dental Drug Reference with Clinical Implications*, was to provide relevant, concise information in a conveniently-sized book that can be stored in the dental operatory. Our focus was to include drugs likely to be reported on the health history and drugs that the dental professional would be likely to use. For that reason, not all drugs are included. If the user encounters a drug that has not been included, but should be, you are asked to notify Lippincott Williams & Wilkins via e-mail to DDR@LWW.com.

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How To Use This Book

Lippincott Williams and Wilkins' Dental Drug Reference with Clinical Implications is divided into three sections.

Section 1: Clinical Medicine and Therapeutics may be read at one's convenience or may be referred to during the clinical decision-making process. The chapters on General Principles of Pharmacology and Adverse Drug Events (the latter of which includes corresponding clinical photographs at the back of this book) provide crucial information on prescribing or using drugs in the clinical setting, and on how other drugs the patient may be taking will affect their oral care. Chapters 3 and 4 describe current recommendations for Medical Management of Pain and Medical Management of Odontogenic Infections. The chapter on the Medical Management of Selected Oral Conditions includes sample prescriptions and corresponding clinical images at the back of the book. The first section of the book is rounded out with a chapter on Clinical Medicine, with recommendations for the dental management of patients with selected systemic diseases, and a chapter outlining a stepwise approach to the Management of Medical Emergencies in the Oral Health Care Setting. The University of Texas Health Science Center at San Antonio, Dental School, is offering Continuing Education credits based on these seven chapters. Instructions on how to obtain CE credits can be found on p. ii at the front of the text.

Section 2: A to Z Listing of Drugs includes concise, clinically relevant dental information for individual drugs or drug combination products likely to be reported on the health history, along with expanded information on drugs prescribed by the dentist. Drugs are listed alphabetically by generic name; brand names and synonyms are cross-referenced to the appropriate generic drug name in the Index. The *concise drug monographs* present information relevant to the oral health care treatment plan. *Drugs likely to be prescribed or used by the dental professional* are identified by a tooth icon (🦷) next to the generic name and contain expanded information to include dosages for the various forms of the product (topical, oral, injectable), interactions, pharmacokinetics, clinical indications, and the pregnancy risk category of the drug.

The following outlines the points of information that are included in each drug monograph. Information that is listed only for drugs prescribed or used by the dental professional are indicated by the tooth icon (🦷).

GENERAL INFORMATION

Drug Name

The generic drug name is listed at the top of each drug monograph, followed by the phonetic pronunciation in parentheses. The pronunciations are based on the USAN Council officially designated pronunciations. If there are alternate generic names used for a particular drug, they will appear in small black font after the written pronunciation, enclosed in parentheses. Common synonyms are preceded by the title "Synonyms."

Trade Name

U.S. trade names for each drug are listed in bold black font. If the drug is administered or prescribed by a dental care provider, the available dosage forms and dosages follow the trade drug name. Common Canadian trade names are indicated by the Canadian flag icon (🍁). Common Mexican trade names are preceded by the Mexican flag icon (). If a trade name is available in both the

U.S. and Canada or Mexico, it will appear in the U.S. list only.

Drug Class — The drug class indicates the drug's classification or therapeutic category.

DEA Schedule — If a drug is a controlled substance, the U.S. Drug Enforcement Administration schedule is listed.

PHARMACOLOGY

Action — Action describes how the drug works.

Uses — All approved indications for the drug are provided.

Unlabeled Uses — Unlabeled uses (indications for which the drug is frequently used but for which it is not approved) are given when applicable.

Contraindications — Contraindications are listed when appropriate. Hypersensitivity to a given drug is always a contraindication and, therefore, this fact is assumed and has not been repeated for every monograph. *Standard Considerations* appears when there are no specific contraindications other than hypersensitivity.

Usual Dosage — The route of administration and typical dosages are provided. Where applicable, dosages are organized by age group and/or condition.

Pharmacokinetics — The Pharmacokinetics section details the absorption (ASORP), distribution (DIST), metabolism (METAB), excretion rate (EXCRET), onset, peak, and duration of the drug, along with useful information on how pharmacokinetic factors differ in certain populations (SPECIAL POP).

Drug Interactions — Drug interaction information indicates the drug category or specific dental drug likely to interact with the subject drug, the likely mechanism of the interaction, and the clinical dental recommendation for the interaction. For *concise drug monographs*, only drug interactions that are relevant to dental treatment are listed, under the heading Drug Interactions Related to Dental Therapeutics. For *drugs that are likely to be used or prescribed by a dental professional*, a more comprehensive listing of interactions is provided. Drug interaction information included throughout the drug monographs is based primarily on clinical reports, with some theoretical interactions. Since new drug interactions are being reported daily, it is important to note that the absence of information doesn't always imply safety.

Adverse Effects — Common or life-threatening adverse reactions for the drug are listed according to the following body systems: oral, central nervous system (CNS), cardiovascular system (CVS), gastrointestinal system (GI), and respiratory system (RESP). Other applicable adverse reactions are listed after the miscellaneous (MISC) heading.

CLINICAL IMPLICATIONS

General	The General section addresses the clinical implications of the drug effects or of the medical condition for which the drug is prescribed. The information provided here may reflect potential changes to the treatment plan and should be reviewed thoroughly prior to initiation of treatment. Where applicable, information is separated into "When prescribed by the dentist" and "When prescribed by medical facility."
Pregnancy Risk Category	Indicates the FDA pregnancy risk category for the drug.
Oral Health Education	The section on Oral Health Education lists information that should be shared with the patient or caregiver, including information on the drug's administration, potential side effects, and safety precautions.

Section 3: Appendices provide clinically useful information in an easy-to-use format. Drugs Listed by Therapeutic Category or Condition can be referenced when the patient cannot recall the name of a drug being taken. Locate the category the agent would most likely fall under, such as "antihypertensive agents," and have the patient look through the list of drug names to identify the drug being used. The Abbreviations appendix defines the abbreviations and acronyms used throughout the drug monographs. Herbal and Nutritional Supplements of Interest to Dentistry lists dentally-relevant information for supplements likely to be consumed. This list is not all-inclusive, and suggestions for updates or additions can be submitted to LWW via e-mail to DDR@LWW.com. Spanish/English Dental Communication Guidelines covers common phrases to assist the dental professional when communicating with a Spanish-speaking patient. The appendix on In-Office Preventive Products is comprised of specific information on products in various categories, including: fluoride varnishes; toothpastes without sodium laurel sulfate, cinnamon or methylparaben; products with therapeutic levels of xylitol; and oral rinses without alcohol. The Laboratory Values for Normal Limits appendix addresses normal values as well as safe limit values for the most common laboratory tests the dental professional would consider when completing a medical consultation.

All of the drug monographs in this handbook are included on the CD-ROM in an easy-to-use, searchable format. Drug information can be printed from the CD and placed into a patient's record for quick reference.

The inside front cover of the text summarizes guidelines for antibiotic prophylaxis prior to dental procedures in specific population groups. The American Heart Association guidelines to prevent bacterial endocarditis following specific oral procedures can be found on the inside front cover of the book; the American Dental Association/American Academy of Orthopedic Society guidelines for total joint removal (TJR) situations are printed opposite the AHA guidelines.

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The authors wish to express their sincere gratitude for the contributions made by the Editorial Review Board, who were selected on the basis of their extensive experience and knowledge.

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Frieda A. Pickett, RDH, MS

This book is dedicated to my mentor, colleague, and friend, the late Dr. William K. Bottomley, who instilled in me an academic discipline essential for lifelong learning; to Frieda A. Pickett, RDH, MS, who conceived the idea of this book; and to my wife, Rebecca, without whose encouragement and support implementation of a project of this magnitude would not have been possible.

Géza T. Terézhalmy, DDS, MA

Editorial Review Board Members and Contributors

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Clinical Medicine and Therapeutics

1 General Principles of Pharmacology

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INTRODUCTION

The science of pharmacology is the study of drugs. Historically, the clinician was responsible for information about the sources, physical and chemical properties, and compounding and dispensing of drugs. These activities are now delegated to pharmacologists and pharmacists. Today, the practitioner's responsibility requires the clinical application of this knowledge. Understanding how chemicals affect physiological homeostasis at the molecular level forms the basis for developing sound therapeutic strategies. Consequently, rational clinical use of therapeutic agents for prevention, diagnosis, and treatment of disease requires an understanding of basic pharmacological principles. These principles apply to all therapeutic agents (including vitamins, herbals, and nutritional supplements) and pertain to pharmacodynamic, pharmacokinetic, and pharmacotherapeutic variables.

PHARMACODYNAMICS

Pharmacodynamics is the study of molecular interactions between drugs and body constituents. It relates to the biochemical and physiological actions of drugs. Drugs circulating in the vascular compartment are carried to tissues. The first step in initiating a drug-induced effect is the formation of a complex between the drug and a cell component generally known as the ***drug receptor***. The ***receptor site*** where a drug acts to initiate a series of biochemical and physiological effects is the ***site of action*** of that drug. The molecular events that follow drug-receptor interactions are called the ***mechanisms of action*** of drugs. However, it should be understood that not all drugs produce their effects by interacting with specific receptors. A number of drugs form chemical bonds with small molecules, chelating agents, or metallic cations. A practical example of this type of drug-receptor interaction is the therapeutic neutralization of gastric acid by antacids. Many other drugs act by physiochemical mechanisms that are not yet understood.

Drug-Receptor Interactions

Drug receptors are cellular macromolecules (Figure 1-1). They may be metabolic or regulatory enzymes or coenzymes; proteins or glycoproteins associated with transport mechanisms; or structural and functional components of lipid membranes or nucleic acids. A single cell may have hundreds of receptor sites. Drugs attach to or interact with these receptor sites by ***covalent bonding***, ***ionic interactions***, ***hydrogen bonding***, or ***Van der Waals forces***, in descending order of bond strength, to produce a definable pharmacological response. Typically, drug-receptor binding is a combination of these interactions. Multiple weak forces, (e.g., multiple van der Waals interactions and a few hydrogen bonds) comprise most drug-receptor interactions. Ionic interactions and covalent bonding are much less common. The ***affinity*** of a drug for a particular receptor and the

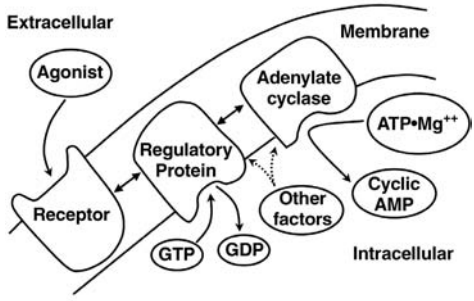

Figure 1-1. Drug receptors are cellular macromolecules.

type of binding is intimately related to the drug's chemical structure. Affinity is expressed by its dissociation constant (K_d), the concentration of a drug required in solution to achieve 50% occupancy of its receptors.

Most drug receptors have two conformational states that are in reversible equilibrium with one another: active state and inactive state. A drug that stabilizes the receptor in its active conformation is called an ***agonist***; a drug that prevents activation of the receptor by the agonist, and has no effect in the absence of the agonist, is referred to as an ***antagonist***. Some drugs cannot be neatly categorized as an agonist or an antagonist: such a drug may be classified as a ***partial agonist*** or an ***inverse agonist***. A partial agonist is a drug that binds to a receptor at its active site but produces only a partial response even when all the receptor sites are occupied. Some receptors are inherently stable in the active state, an inverse agonist acts by abrogating this intrinsic activity and stabilizes the receptor in the inactive state.

Antagonists can be divided into receptor and nonreceptor antagonists. A ***receptor antagonist*** binds either the agonist binding site or an allosteric site on a receptor. Binding the active site prevents the binding of the agonist to the receptor. Binding of the antagonist to an allosteric site either alters the affinity (K_d) of the agonist to the receptor or prevents the conformational change required to activate the receptor. Receptor antagonists can be classified as either competitive or noncompetitive. A ***competitive antagonist*** binds reversibly to the active site of a receptor; however, high concentrations of the agonist are able to overcome competitive antagonism. A ***noncompetitive antagonist*** binds to either the active site or an allosteric site of a receptor covalently, i.e., with very high affinity, and the binding is irreversible.

A ***nonreceptor antagonist*** does not bind to the receptor for the agonist, but it can still inhibit the agonist to initiate a response. A nonreceptor antagonist can be classified as a chemical antagonist or as a physiological antagonist. A ***chemical antagonist*** inactivates an agonist so that the agonist is no longer capable of binding to and activating the receptor. A ***physiological antagonist*** activates or blocks a receptor that mediates a response physiologically opposite to that of the receptor agonist.

Receptor Classification

Receptors are classified according to the type of drug that they interact with or according to the specific physiologic response produced by the drug-receptor complex. By evaluating the effects of different agonists in the presence of a given antagonist, receptors may also be subclassified. For example, cholinergic receptors can be activated either by muscarine or nicotine; however, only the response to muscarine is antagonized by atropine, while curare will only antagonize the response to nicotine. This evidence suggests that acetylcholine can bind to or activate at least two different receptor subtypes, which are either muscarinic or nicotinic. Similarly, receptors and receptor subtypes exist for many other agents. The number of any given receptor type or subtype on a cell may also vary. Certain disease states or drugs taken chronically and/or in large doses may increase (up-regulate) or decrease (down-regulate) the number of receptors and provide a degree of adaptability in the face of changing physiologic events.

Dose-Response Relationships

Pharmacodynamics is based on the concept of cellular drug-receptor binding. When a sufficient number of receptors are bound on a cell, the cumulative

effect of receptor occupancy becomes apparent in that cell. When the response occurs in many cells, the effect will be seen at the level of an organ. There are two major types of dose-response relationships: graded and quantal.

Graded dose-response relationships describe the effect of various doses of a drug on an individual. This relationship is expressed visually and mathematically with a graded dose-response curve. The curve is established by placing the logarithmic value for dosage (or ***log dose***) on the x-axis and the quantified response on the y-axis (Figure 1-2). Two important parameters can be deduced from the graded does-response curve: potency and efficacy. The ***potency (EC_{50})*** of a drug is the concentration at which the drug elicits 50% of its maximal response and is related to the affinity of that drug to its receptor. The ***efficacy (E_{max})*** is the maximal response produced by the drug and is related to the intrinsic activity of that drug once a drug-receptor complex is formed. The dose of a drug associated with (E_{max}) is called the ***ceiling dose*** of that drug.

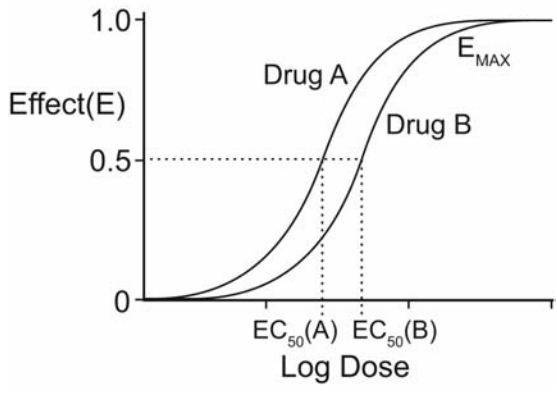

Figure 1-2. Graded dose-response curves. The upper plateau of the curve represents the E_{max} of a drug. EC_{50} is the potency of a drug. In the figure, drug A is more potent than drug B, yet drug A and drug B exhibit the same efficacy. Clearly, EC_{50} and E_{max} are not intrinsically related.

Quantal dose-response relationships show the average effect of a drug, as a function of its concentration, in a population of individuals. This relationship is expressed visually and mathematically with a quantal dose-response curve. The curve is established by placing

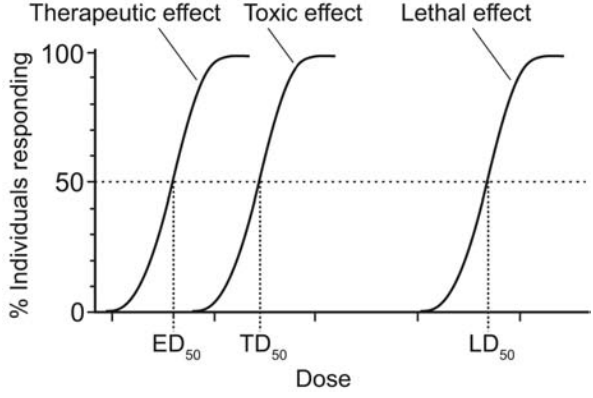

Figure 1-3. Quantal dose-response curves demonstrate the average effect of a drug, as a function of its concentration, in a population of individuals. ED_{50}, TD_{50}, and LD_{50} represent the dose required to produce a beneficial, toxic, and lethal effect in 50% of the individuals within the same population, respectively.

the logarithmic value for dosage (log dose) on the x-axis and the response defined as either present or not present (quantal, not graded) in the percentage of individuals responding on the y-axis (Figure 1-3). Three important parameters can be deduced from the quantal dose-response curve: effectiveness (therapeutic effect), toxicity (adverse effect), and lethality (lethal effect). The doses that produce these responses in 50% of a population are known as the ***median effective dose (ED_{50})***, ***median toxic dose (TD_{50})***, and ***medial lethal dose (LD_{50})***, respectively. The ***therapeutic window*** is the range of doses of a drug that elicits a therapeutic response, without unacceptable adverse drug effects (toxicity) in a patient population. The therapeutic window can be quantified by the ***therapeutic index (TI)***, expressed mathematically as $TI = TD_{50}/ED_{50}$. A large TI reflects a large therapeutic window and a small TI reflects a narrow therapeutic window.

PHARMACOKINETICS

To produce an effect, most drugs must pass through biological membranes to gain access to their receptor(s). Small, water-soluble substances may pass through aqueous channels by a process known as ***filtration***. Most drugs, however, are weak acids or weak bases too large to pass through aqueous channels. The passage of these drug molecules across cell membranes is achieved primarily by ***passive diffusion*** along a concentration gradient. Other drugs may cross biological membranes by ***facilitated diffusion*** or ***active transport***. In these processes a drug is carried across biological membranes by forming a complex with a component of the cell membrane, the complex is carried through the membrane, the drug is released, and the carrier returns to the original surface to repeat the process. ***Facilitated diffusion*** does not require energy and does not proceed against a concentration gradient. Conversely, ***active transport*** is characterized by selectivity, competitive inhibition, requirement for energy, saturability, and movement against an electrochemical gradient. Some water-insoluble substances are engulfed by the cell membrane and are released unchanged in the cytoplasm by the process known as ***pinocytosis***.

Absorption

Most drugs are weak acids or weak bases that diffuse through the lipid component of the cell membrane as a function of the drug's molecular weight, lipid solubility coefficient, pK_a (the pH at which a drug is 50% ionized and 50% un-ionized), and concentration. In general, drugs with a small molecular weight will cross biological membranes more readily than drugs with a large molecular weight. The nonpolar, un-ionized form of a drug will diffuse across biological membranes more readily than its ionized, polar fraction. Drugs administered in high concentration are more readily absorbed than low concentrations of the same drug. A drug's formulation and its route of administration further influence absorption.

Routes of drug administration

Enteral. The oral route is the most common, convenient, and economical method of drug administration. It is also the most unpredictable. When a drug is administered enterally, its rate of absorption into the systemic circulation is influenced by the inherent characteristics of the drug, the pH of the gastrointestinal tract, the presence of food in the stomach, gastric motility, splanchnic blood flow, and, importantly, patient compliance with the prescribed drug regi-

men. In addition, the anatomic relationship between the liver and the gastrointestinal tract and the blood supply of these organs has important implications on drug absorption. Because the liver is situated between enteric sites of absorption and the systemic circulation, it can profoundly influence the bioavailability of a drug given orally—an action that has been described as the ***first-pass effect***. ***Bioavailability*** is defined as the fraction of the dose of a drug that enters the systemic circulation. A drug given orally that is efficiently removed from the bloodstream by the liver will have low bioavailability.

Parenteral. Intravenous (IV) administration provides for accurate and immediate deposition of drugs into the bloodstream unaffected by hepatic first-pass metabolism. The dose can be adjusted to patient response; however, once a drug is injected there is no recall. Sterile formulations of soluble substances and an aseptic technique are required. Local irritation and thromboembolic complications may occur with some drugs.

Following subcutaneous (SC) injections, a drug's rate of absorption into the bloodstream is slow and sufficiently constant to provide a sustained effect. The incorporation of a vasoconstrictor into a drug formulation may further retard the rate of absorption. Local tissue irritation characterized by sloughing, necrosis, and severe pain may occur.

Intramuscular (IM) injections allow for rapid absorption of aqueous solutions into the bloodstream. Oily or other nonaqueous vehicles may provide slow, constant absorption. Substances considered too irritating by the IV and SC routes may, in some instances, be given IM.

Topical. Absorption of drugs through skin and mucosa by passive diffusion is proportional to their concentration and lipid solubility. Since venous drainage from the mouth is via the superior vena cava, sublingual administration of certain drugs is effective owing to the large area of vascular flow. This direct absorption also has an advantage over enteric administration because it circumvents the metabolic first-pass breakdown in the liver. The large pulmonary absorptive surface allows for rapid access of gaseous, volatile agents to the circulation. Drugs administered by inhalation may act locally or cross the alveoli; they then travel in the systemic blood flow and act at the appropriate effector site. Concentration is controlled at the alveolar level, since most of these drugs are exhaled immediately. The rectal route of drug administration may be useful in young children and for unconscious or vomiting patients; however, absorption is unpredictable.

Distribution

Following absorption into the circulation, drugs are distributed into both the extracellular and intracellular environment. Diffusion into the extracellular space occurs rapidly. However, many drugs are bound to plasma proteins, which limits their ability to leave the vascular compartment and affect their concentration in tissues and at their sites of action. Plasma protein binding is a nonselective process. Many drugs compete with each other and with endogenous substances for these binding sites. Once a drug leaves the vascular compartment, it may accumulate in tissues in higher than expected concentration as a result of the pK_a of the drug and the pH of the environment. Highly perfused organs such as the heart, liver, kidney, and brain will receive most of the drug within minutes of absorption. Muscle, most viscera, skin, and fat may require a much longer amount of time before equilibrium is achieved. The distribution of drugs to the central nervous system and cerebrospinal fluid is further re-

stricted by the blood-brain barrier. However, the only limiting factor associated with highly lipid-soluble uncharged drugs is cerebral blood flow. Redistribution may affect the duration of a drug effect when a compound of high lipid solubility acts on the brain or cardiovascular system after administration and then is redistributed to other tissues.

Metabolism

Lipid-soluble weak acids and bases are not readily eliminated from the body. Metabolism fosters drug excretion by biotransforming them into more polar, water-soluble fractions, although many drug metabolites maintain a degree of pharmacological activity. If drug metabolites are active, termination of drug action takes place by further biotransformation or by excretion of the active metabolites. The chemical reactions associated with biotransformation may be nonsynthetic (Phase I) or synthetic (Phase II). In a Phase I reaction, a drug is oxidized or reduced to a more polar compound. In a Phase II reaction, an endogenous macromolecule is conjugated to the drug. Drugs undergoing conjugation reactions (Phase II) may have already undergone Phase I biotransformation. The hepatic microsomal enzyme (cytochrome P450) system is responsible for the biotransformation (oxidation/reduction) of most drugs; however, enzymes in plasma and renal, pulmonary, and gastrointestinal metabolism make notable contributions. The cytochrome P450 enzyme system can be "induced" to increase or reduce the rate of a drug's metabolism and is responsible for many adverse drug effects. Nonmicrosomal enzyme activity also contributes to the process of biotransformation. However, nonmicrosomal enzymes involved in drug biotransformation are not usually inducible.

Excretion

Drugs are excreted from the body either unchanged or as metabolites. Polar compounds are excreted more readily than nonpolar compounds. Consequently, lipid-soluble substances have to be metabolized to more polar fractions before they can be excreted. The kidney is the most important organ responsible for the elimination of drugs and their metabolites from the body. Renal excretion may involve three processes: (1) glomerular filtration, which depends on fractional plasma protein binding and filtration rate; (2) active tubular excretion, a nonselective carrier system for organic ions; and (3) passive tubular reabsorption of un-ionized drugs, which results in net passive reabsorption. Some metabolites formed in the liver are excreted via the bile into the intestinal tract. If these metabolites are subsequently hydrolyzed and reabsorbed from the gut (enterohepatic recirculation), drug action is prolonged. Pulmonary excretion is important mainly for the elimination of anesthetic gases and vapors. Drugs excreted in milk are potential sources of unwanted pharmacological effects in nursing infants. Other routes, such as saliva, sweat, and tears, are quantitatively unimportant.

The removal of most drugs from the body follows exponential or ***first-order kinetics***. Assuming a relatively uniform distribution of a drug within the body (considered to be a single compartment), first-order kinetics implies that a constant fraction of the drug is eliminated per unit time. The rate of exponential kinetics may be expressed by its constant (k), the fractional change per unit time, or its half-life ($t_{1/2}$), the time required for the plasma concentration of a drug to decrease by 50%. The ***distribution half-life*** represents the rapid decline in plasma drug concentration as 50% of the drug is distributed throughout the body. The ***elimination half-life*** reflects the time required to metabolize and

excrete 50% of the drug from the system. Multiple dosage intervals, which are shorter than the drug's half-life, will lead to a plateau level of accumulation of the drug over four half-lives. This plateau, known as the ***steady-state concentration***, represents a rate of administration that is equal to the rate of elimination. Fluctuations in the plasma concentrations will occur as a function of the dosage interval and the drug's elimination half-life (Figure 1-4). Assuming first-order kinetics, it takes approximately four half-lives to eliminate a drug from the body. The elimination of some drugs (e.g., alcohol) may follow zero-order kinetics, implying that a constant amount of the drug is eliminated per unit time.

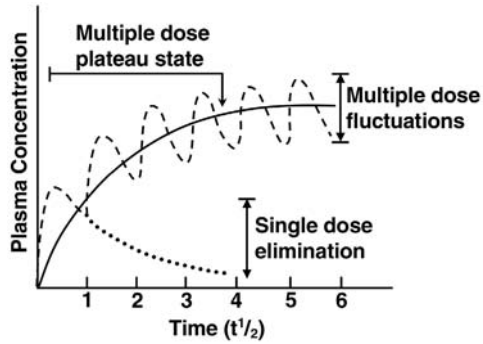

Figure 1-4. The effect of dosing on plasma concentrations.

PHARMACOTHERAPEUTICS

Pharmacotherapeutic principles relate to the use of drugs in the diagnosis, prevention, and treatment of disease. The dosing regimen, which takes into account the route, amount, and frequency of drug administration, influences the onset and duration of drug action. If the desired full effect of a drug must be achieved promptly, a ***loading dose***, which is larger than the ***maintenance dose***, must be employed. Following the administration of maintenance doses, a drug's concentration in plasma is characterized by the time course of accumulation, the maximal amount accumulated, and the fluctuations associated with the dose interval and the half-life of the drug. Dosage intervals are predicated on the fluctuation in drug concentration that can be tolerated without toxicity or loss of efficacy; however, different patients show significant variations in response to the same dosage regimen. Optimal pharmacotherapy depends on the clinician's awareness of the sources of such variations, which include both disease-related and patient-related factors.

Pharmacogenetic Factors

Genetic determinants may affect both pharmacokinetic and pharmacodynamic factors and contribute to the normal variability of drug effects. The dose of a drug required to produce a specific response in an individual is referred to as the ***individual effective dose***. If a drug produces its usual effect on a patient at an unexpectedly high dose, the patient is said to be ***hyporeactive***. A patient is said to be ***hyperreactive*** when a drug produces its effect at an unexpectedly low dose. Decreased response to a drug as a result of prior exposure to the drug is described as ***tolerance***. When this occurs, ***cross-tolerance*** may develop to the effects of other, structurally related drugs. In the case of tolerance, drug dosage must be increased to maintain an acceptable therapeutic response. When tolerance develops rapidly, subsequent to the administration of only a few doses of a drug, the response is described as ***tachyphylaxis***. An unusual reaction of any intensity, irrespective of drug dosage,

observed in a small percentage of the patients is referred to as ***idiosyncrasy*** or an ***idiosyncratic reaction***.

Weight of the Patient

Optimum therapeutic doses intended to produce a specific effect are generally determined in terms of the amount of drug per kilogram of body weight of the patient. Although there are many rules and formulae to calculate dosages, doses based on manufacturer recommendations or the prescriber's experience provide the most reasonable approach to dosing.

The Pregnant Patient

Fetal abnormalities occur in 3% to 6% of pregnancies in the United States and drugs are considered to be responsible for 1% to 5% of these malformations. Each drug has a threshold concentration above which fetal abnormalities can occur and below which no effects are discernible. Whether a drug reaches the threshold concentration in the fetus depends on the chemical nature of the agent (molecular weight, protein binding, lipid solubility, pK_a); interacting drugs, herbals, and dietary supplements consumed by the patient; and maternal pharmacokinetic factors. Most drugs in the maternal bloodstream cross the placenta by passive diffusion along the concentration gradient. During early pregnancy the placental membrane is relatively thick, which tends to reduce permeability. The thickness decreases and the surface area of the placenta increases in the later trimesters, increasing the passage of drugs.

Human teratogenicity is not predictable. Major malformations are usually the result of exposure to drugs during the critical period of organogenesis (first trimester). Exposure during the second and third trimesters primarily affects organ function. Any drug in the fetal system at the time of birth must rely on the infant's own metabolic and excretory capabilities, which have not yet fully developed. Consequently, drugs given near term, especially those with long half-lives, may have a prolonged effect on the newborn. Finally, drugs that cause maternal addiction are also known to cause fetal addiction and the fetus can undergo withdrawal following delivery. To assist practitioners in prescribing drugs for the pregnant patient, the U.S. Food and Drug Administration (FDA) has established a code for categorizing drugs according to their potential to cause fetal injury (Table 1-1). In certain clinical situations, drug administration to resolve an emerging dental problem may be unavoidable in a pregnant woman and may require the use of local anesthetics, analgesics, antibiotics, and anxiolytic agents.

The Nursing Patient

With the increasing recognition of the advantages of breastfeeding, clinicians must often weigh the risks versus benefits of drug therapy in lactating women. The rate of passage of a drug from plasma to milk depends on the characteristics of the drug, such as the drug's molecular weight, lipid solubility, pK_a, and degree of plasma protein binding. The pK_a of weak electrolytes is an important determinant of drug concentration in milk because the pH of milk is generally lower (more acidic) than that of plasma and milk can act as an "ion trap" for weak bases. At equilibrium, basic drugs may become more concentrated in milk. Conversely, acidic drugs are limited in their ability to enter milk because the concentration of the nonionized free form in milk is higher than it is in plasma, causing a net transfer of the drug from milk to plasma.

The ratio of drug concentration in breast milk to drug concentration in maternal plasma is called the ***milk-to-plasma drug-concentration ratio***. Most

Table 1-1. FDA Risk Stratification of Drugs

Category A:	Controlled studies in women fail to demonstrate a risk to the fetus in the first trimester; possibility of fetal harm appears remote.
Category B:	Either animal studies do not indicate a risk to the fetus, and there are no controlled studies in women; or animal studies have shown an adverse effect, but controlled studies in women failed to demonstrate risk.
Category C:	Either animal studies do not indicate fetal risk, and there are no controlled studies in women; or studies in women and animals are not available.
Category D:	There is positive evidence of fetal risk, but the benefits may be acceptable despite the risk.
Category X:	There is definite fetal risk based on studies in animals or humans; or based on human experience, and the risk clearly outweighs any possible benefit.

Briggs GG, Freeman RK, Yaffe SJ. A Reference Guide to Fetal and Neonatal Risk—Drugs in Pregnancy and Lactation. 5th ed. Philadelphia: Lippincott Williams & Wilkins; 1998.

drugs for which data are available have a milk-to-plasma ratio of 1 or less; about 25% have ratios of more than 1; and about 15% have ratios of more than 2. If the precise concentration of a drug in breast milk over time is known, one can estimate the dose the infant will ingest per unit time by assuming intake of a specific amount of milk (e.g., 150 mL per kilogram of body weight per day). This estimated dose is then expressed as a percentage of the therapeutic (or equivalent) dose for the infant. For most drugs, the dose below which there is no clinical effect in infants is unknown. This uncertainty led to arbitrarily defining as "safe" a value of no more than 10% of the therapeutic dose for infants.

Factors that determine the advisability of using a particular drug in a nursing mother include the potential for acute or long-term dose-related and non–dose-related toxicity, dosage and duration of therapy, age of the infant, quantity of milk consumed by the infant, and the drug's effect on lactation. To minimize the infant's exposure to medications in milk, clinicians should consider the following strategies: withhold drug therapy; delay drug therapy temporarily; choose a drug that passes poorly into milk; use alternative routes of drug administration (i.e., topical, inhalation); advise the mother to avoid nursing at peak plasma concentrations of the drug; administer the drug to the mother before the infant's longest sleep period; and/or withhold breastfeeding temporarily.

The Pediatric Patient

Pediatric drug therapy presents a unique challenge to clinicians. Often there is a paucity of pediatric-specific data in the literature from which to derive appropriate dosage regimens. Dosage forms are usually designed with the adult population in mind, and the dosage cannot easily be individualized for children. Even when appropriate dosage forms for children are available, palatability, resistance to taking medications, and compliance issues may hinder optimal therapy. Finally, children often do not react the same as adults to certain medications (i.e., paradoxical hyperactivity, which may be observed in children tak-

ing chloral derivatives or barbiturates). Clinicians must therefore use medications for which data are extrapolated on the basis of limited pharmacodynamic and pharmacokinetic knowledge. Conservative dosage, especially initially, with close monitoring for dose-related effects is imperative. Information on specific drugs administered or prescribed by dentists can be found in the pediatric dosage section of individual drug monographs.

The Elderly Patient

Geriatric drug therapy is another important area of therapeutics because of the growing elderly population, their disproportionately high use of medications, and their increased risk of adverse drug events. Optimization of drug therapy in the elderly requires an understanding of how aging and concomitant disease affect the pharmacodynamics and pharmacokinetics of drugs, an appreciation for the wide physiologic variability in the elderly population, and acknowledgment of the elderly patient's expectations of therapy. The results of drug studies using young adult subjects cannot be extrapolated accurately to the elderly. Conservative dosage, especially initially, with close monitoring for dose-related effects is imperative. Information on specific drugs administered or prescribed by dentists can be found in the geriatric dosage section of individual drug monographs.

The Patient With Hepatic Dysfunction

The spectrum of liver disease is extremely wide. Most of the underlying pathophysiologic mechanisms are accounted for by autoimmune disease, viral infection, and toxic insult, which lead to hepatitis and cirrhosis. Patients with acute hepatitis usually experience transient reduction in liver function. Patients with chronic hepatitis and hepatic cirrhosis demonstrate permanent loss of functional hepatocytes. Liver dysfunction is one of the most common causes of morbidity in patients receiving pharmacotherapeutic agents. Most adverse drug reactions in the presence of liver disease are related to altered pharmacokinetics.

The most widely accepted predictor of liver disease to estimate the ability of the liver to metabolize drugs is to determine the Child-Pugh score (Table 1-2). The Child-Pugh score consists of five laboratory tests or clinical symptoms:

Table 1-2. Child-Pugh Scores for Patients With Liver Disease

Test/Symptoms	Score 1 Point Each	Score 2 Points Each	Score 3 Points Each
Total bilirubin (mg/dL)	< 2.0	2.0–3.0	> 3.0
Serum albumin (g/dL)	> 3.5	2.8–3.5	< 2.8
Prothrombin time (seconds prolonged over control)	< 4	4–6	> 6
Ascites	Absent	Slight	Moderate
Hepatic encephalopathy	None	Moderate	Severe

Pugh RNH, Murray-Lyon IM, Dawson JL, Pietroni MC, Williams R. Transection of the oesophagus for bleeding oesophageal varices. Br J Surg 1973;60:646–649.

total bilirubin, serum albumin, prothrombin time, ascites, and hepatic encephalopathy. Each of these areas is given a score of 1 (normal) to 3 (severely abnormal) and the scores for the five areas are totaled. The Child-Pugh score for a patient with normal liver function is 5, whereas the score for a patient with grossly abnormal serum albumin, total bilirubin, and prothrombin time values, in addition to sever ascites and hepatic encephalopathy, is 15. For drugs that are metabolized primarily by the liver, a Child-Pugh score of 8 to 9 is grounds for a moderate decrease (~25%) in daily dose for drugs, while a score of 10 or greater indicates that a significant decrease in daily dose (~50%) is required.

The Patient With Renal Dysfunction

Renal failure is said to occur when the kidneys are no longer able to carry out their normal excretory functions. The condition may be either acute or chronic. In acute failure, there is a sudden marked reduction in urine flow associated with an episode of infection, trauma, severe burns, blood transfusion, or the administration of a nephrotoxic drug. Chronic renal failure frequently follows glomerulonephritis, pyelonephritis, and nephritic syndrome. Most patients with chronic renal failure may also have other medical problems that either contributed to the development of renal dysfunction or are a complication of chronic renal failure. Many of these conditions respond to pharmacotherapy. Consequently, patients with renal failure are at increased risk for adverse drug events because of the number of drugs they are taking, concurrent medical problems, and impaired renal function. Drug-related complications, however, can be minimized by the rational use of drugs based on an understanding of pharmacokinetic changes associated with renal failure.

The degree to which renal failure impairs drug elimination depends largely on the percentage of drug excreted by the kidneys. For many drugs, linear correlates have been established between the elimination half-life of the drug and creatinine clearance (Cl_{cr}). Consequently, when presented with a patient with impaired renal function for whom drug dosage regimen decisions are to be made, one should look to the Cl_{cr} as an index of renal function. Mathematically:

$$Cl_{cr}(\text{male}) = 140 - \text{age in yrs} \times \text{weight (kg)}/72 \times \text{serum creatinine}$$

$$Cl_{cr}(\text{female}) = 140 - \text{age in yrs} \times \text{weight (kg)} \times 0.85/72 \times \text{serum creatinine}$$

where body weight is in kg and serum creatinine in mg/dL. For a drug excreted entirely by the kidney, adjustment is simple. A 50% decline in renal function necessitates either halving the dose or doubling the usual dosage interval. The variable interval method leads to more extreme peak-trough levels and is best for drugs with long half-lives.

The Patient on Hemodialysis

Drug prescribing is further complicated when patients with renal failure are put on hemodialysis because they may lose therapeutic levels of some drugs in the dialysis bath. Many factors contribute to the rate of drug removal, such as the type of dialyzer equipment (conventional versus high-flux), dialysis membrane characteristics (cuprophane versus polysulfone), dialysate flow rate (most conventional hemodialysis runs are 4 hours, whereas high-flux dialysis procedures last 2 to 2.5 hours), and specific properties of the drug in question (molecular weight, lipid solubility, volume of distribution, plasma protein binding). Drugs with a small molecular weight (<500 daltons) cross conventional cuprophane dialysis membranes readily. Large molecular weight drugs are not

effectively removed by conventional dialysis. The polysulfone membranes used in high-flux dialysis systems, however, readily remove large molecular weight compounds. Drugs with high water solubility are more easily removed to the aqueous dialysate than more lipid-soluble compounds. Lipid-soluble compounds also have a larger volume of distribution and are not accessible for removal. Plasma protein binding of a drug further determines how effectively it can be dialyzed. Drugs with a high degree of protein binding are poorly removed by dialysis because the drug-protein complex is too large to cross most dialysis membranes. Drug dialysis data are not readily available for many drugs. A sensible rule to follow for drugs that may be substantially removed by dialysis is to administer maintenance doses at the conclusion of dialysis treatment.

Compliance

A ***compliant patient*** is one who follows the therapeutic regimen recommended by the clinician. In contrast, a patient is considered noncompliant if the patient fails to follow a regimen to the extent that therapeutic goals are not achieved. There are several determinants of compliance that take into consideration the disease, the patient, the practitioner, the treatment regimen, economic factors, and the interaction of each of these factors. Patient trust in the clinician and treatment as established during the office visit is important. A patient tends to be more compliant if he or she has a good understanding of the illness and the therapy; therefore, good communication between the clinician and patient is a major aid to compliance. A positive office visit and attitude, along with individualization of regimens and good follow-up on the clinician's part, improve compliance.

The nature of the illness itself has an important influence on patient compliance. The more serious or disabling an illness is, the more likely the patient will follow the regimen. The patient's perception of the severity of the illness is the major factor influencing compliance. The longer the duration of treatment, the less will be the compliance as time goes on. This is especially true if symptoms are relieved before drug therapy is to be discontinued. The regimen itself may be discouraging or confusing to the patient because of multiple drug use, scheduling of dosages, side effects, cost, and access to or dispensing of the drug.

Noncompliance in the pediatric patient is complicated by a parent-guardian factor. The major reason for noncompliance in children is a dislike for the taste or smell of the medication. If it is frustrating to the parent-guardian to give the medication, they are more likely to skip doses or discontinue the medication when symptoms disappear. One must also consider the possibility of a negative parent-guardian attitude transferring to the child. If the child is attending school, the regimen should have a convenient schedule for doses coordinated with the school schedule. Consider recommending specific times rather than generalizing.

Noncompliance in the geriatric patient is not uncommon. Patients may fail to fill prescriptions because of transportation problems, expense, or lack of trust in the doctor or therapy. Poor comprehension of the therapy and concurrent multiple drug therapies are common reasons for omission of doses. Difficulty in opening packages or swallowing pills, poor memory, and visual or hearing impairment may also contribute to confusion in compliance. A good understanding of the patient's needs and fears will help the clinician to indivi-

dualize drug therapy for better compliance. Repetition of directions with written instructions and clear labeling is helpful.

PRESCRIPTION WRITING

The essence of prescription writing is to ensure that the pharmacist knows exactly which drug formulation and dosage to dispense, and the patient has explicit written instructions for self-administration of the prescribed drug. It is practical to consider the prescription to consist of three components: a heading, a body, and a closing. The heading identifies the prescriber (name, phone number, and address), exhibits the date of the prescription, and lists the patient information (name, age, and address). The body tells the pharmacist the specific drug, dosage unit or concentration, and amount to be dispensed. It also provides directions to the patient (transcribed by the pharmacist to the packaged drug), which state precisely how the patient is to self-administer the drug. The closing exhibits the signature of the prescriber, the prescriber's Drug Enforcement Administration (DEA) number (if applicable), instructions to the pharmacist about product selection (generic versus brand name), and other issues.

Metric and Household Measures

The metric system is the language of scientific measurement and should always be used in prescription writing (Table 1-3). Solid drugs are dispensed by weight (mg) and liquid drugs by volume (mL). Although the clinician will direct the pharmacist to dispense a liquid preparation in milliliters, it is generally necessary to convert this to a convenient household measurement in directions to the patient (Table 1-3). When greater accuracy is required, the patient may need to use a graduated cylinder or a calibrated dropper.

Abbreviations

Abbreviations are used in prescription writing to save time and to make alteration of a prescription by the patient more difficult (Table 1-4). However, unless a practitioner writes a large number of prescriptions daily, he or she saves little time using abbreviations. Since abbreviations are more likely to be misinterpreted by the pharmacist than are instructions written in full, the practitioner should ensure the clarity of the information.

Table 1-3. Metric and Household Measures

Weight	
kilogram = kg	1 kg = 1000 g
gram = g	1 g = 1000 mg
milligram = mg	1 mg = 1/1000 g
pound = lb	1 kg = 2.2 lb
grain = gr	1 gr = 65 mg
Volume	
liter = L	1 L = 1000 mL
milliliter = mL	1 mL = 1/1000 L
teaspoonful = tsp	1 tsp = 5 mL
tablespoonful = tbs	1 tbs = 15 mL
drop = gtt	1 ml = 15 gtt
fluid ounce = fl oz	1 fl oz = 30 mL

Table 1-4. Commonly Used Abbreviations

dispense = disp	as needed = prn
number = no	every hour = qh
capsule = cap	every day = qd
tablet = tab	twice a day = bid
label = sig	3 times a day = tid
by mouth = po	4 times a day = qid
at once = stat	discontinue = d/c

Regulations

The Food and Drugs Act of 1906 was the first federal law to regulate interstate commerce in drugs. It was rewritten and reenacted to become the Federal Food, Drug, and Cosmetic Act of 1938. This law and its subsequent amendments, enforced by the FDA of the U.S. Department of Health and Human Services, prohibit interstate commerce in drugs that have not been shown to be safe and effective. They further regulate labeling and packaging and establish standards for strength and purity. Over the years, Congress has enacted more than 50 pieces of legislation related to drug control. The Controlled Substances Act of 1970 collects and conforms most of these diverse laws into one piece of legislation. The law is designed to improve the administration and regulation of manufacturing, distribution, and dispensing of drugs, and to provide a "closed" system for the legitimate handlers of controlled substances. Individual states or local governments may legislate additional requirements concerning controlled substances. Whenever state and federal laws differ, the most stringent law must be followed.

Every practitioner who administers, prescribes, or dispenses controlled substances must be registered with the Drug Enforcement Administration, Registration Unit, P.O. Box 28083, Central Station, Washington, DC 20005. The 1984 Diversion Control Amendments, a part of the Comprehensive Crime Control Act, give the Attorney General authority to deny an application for registration if it is determined that the issuance of such registration would be inconsistent with the public interest. In determining the public interest, the following factors are considered: the recommendation of the appropriate state licensing board or professional disciplinary authority, the applicant's experience in dispensing or conducting research with respect to controlled substances, and the applicant's conviction record under federal or state laws relating to the manufacture, distribution, or dispensing of controlled substances.

Controlled substances

The drugs that come under the jurisdiction of the Controlled Substances Act of 1970 are divided into five schedules (Table 1-5). All prescription orders for controlled substances must be written in ink or typewritten; must bear the full name and address of the patient; must list the full name, address, and DEA registration number of the practitioner; must be dated; and must be manually signed by the practitioner. When prescribing a controlled substance, the clinician must write out the actual amount in addition to giving an Arabic number or Roman numeral to discourage alterations in written prescription orders. To avoid misprescribing, overprescribing, or inappropriate prescribing, clinicians must also be aware of gimmicks and techniques used by drug abusers to obtain controlled substances, be cautious of patients who self-diagnose and self-

Table 1-5. Drug Schedules

	Description	Example(s)
Schedule I (C-I)	C-I drugs have no legal medical use in the United States and have a high abuse potential. They may be used for research purposes and must be obtained from governmental agencies.	• hallucinogens • marijuana • selected opiates (heroin, opium derivatives)
Schedule II (C-II)	C-II drugs have legal medical uses in the United States, but they have a high abuse potential, which may lead to severe psychological and/or physical dependence. A written prescription order is required for C-II drugs. The refilling of C-II prescription orders is prohibited. In the case of a bona fide emergency, a practitioner may telephone a prescription order to a pharmacist. In such a case, the drug prescribed must be limited to the amount needed to treat the patient during the emergency period. Such oral orders must be followed up by a written order within 72 hours.	• amphetamines • selected opiates (morphine and congeners, codeine congeners, methadone) • some barbiturates
Schedule III (C-III)	C-III drugs have legal medical uses in the United States, and a moderate abuse potential, which may lead to moderate psychological and/or physical dependence. A prescription order for C-III drugs may be issued either orally or in writing to the pharmacist and may be refilled, up to five times within 6 months after the date of issue, if so authorized on the prescription. After five refills or after 6 months, a new oral or written prescription is required.	• anabolic steroids • selected opiates (APAP w/codeine)

(continues)

Table 1-5. Drug Schedules *(continued)*

	Description	Example(s)
Schedule IV (C-IV)	C-IV drugs have legal medical uses in the United States, but a low abuse potential, which may lead to moderate psychological and/or physical dependence. A prescription order for C-IV drugs may be issued either orally or in writing to the pharmacist and may be refilled, up to five times within 6 months after the date of issue, if so authorized on the prescription. After five refills or after 6 months, a new oral or written prescription is required.	• benzodiazepines • selected opiates (propoxyphene) • some barbiturates
Schedule V (C-V)	C-V drugs have legal medical uses in the United States, but a low abuse potential, which may lead to moderate psychological and/or physical dependence. A prescription order for C-V may be issued either orally or in writing to the pharmacist and may be refilled if so authorized on the prescription.	• selected opiates (cough and diarrhea preparations)

prescribe, and be alert to a series of "new" patients all complaining of similar symptoms.

CONCLUSION

It should be emphasized that drugs seldom exert their beneficial effects without also causing adverse side effects. The inevitability of this therapeutic dilemma lends credence to the statement that there are no "absolutely" safe biologically active agents. In dealing with this certainty, the clinician familiar with the molecular mechanisms of drug action, principles of disposition, and therapeutic and toxic effects of drugs has the advantage. By reviewing a patient's medical history, the clinician can identify the medically or pharmacologically compromised patient and avoid prescribing drugs that may produce potential drug-drug, drug-disease, or drug-food interactions, or cause drug-induced illness. It cannot be overemphasized that patients may fail to report the intake of over-the-counter preparations and herbal and other dietary supplements, as well as illicit drugs; therefore, a patient's health and drug profile must also reflect an adequate social history. Furthermore, clinicians should avoid misprescribing, overprescribing, or inappropriate prescribing and be aware of gimmicks and techniques used by drug seekers to obtain controlled substances.

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2 Adverse Drug Events

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INTRODUCTION

Drugs, including herbal remedies and various dietary supplements, seldom exert their beneficial effects without also causing adverse events. The inevitability of this therapeutic dilemma lends credence to the statement that there are no "absolutely" safe biologically active agents. When selecting a drug necessary to obtain a desired therapeutic effect, prescribers must take into consideration the diagnosis, individual variations in physiological homeostatic mechanisms, variations in disease states, and drug-related pharmacodynamic and pharmacokinetic variables. Oral health care providers, like other health care professionals, should be aware of the spectrum of drug-induced events and should be actively involved in monitoring for and reporting ***adverse drug events (ADEs)***.

ETIOLOGY AND EPIDEMIOLOGY

It is estimated that as many as 75% of office visits to general medical practitioners and internists are associated with the initiation or continuation of pharmacotherapy. Chemotherapy of this magnitude predisposes patients to ADEs. The frequency of clinically important ADEs is difficult to estimate, but it has been reported that between 3% and 11% of hospital admissions could be attributed to ADEs. The incidence of ADEs during hospitalization ranges from 0.3% to 44.0%, depending on the type of hospital, definition of an ADE, and study methodology. While the U.S. Food and Drug Administration (FDA) has one of the most rigorous approval requirements in the world to authorize the marketing of new drugs (Table 2-1), clinical trials cannot and are not expected to uncover every potential ADE.

Premarketing study groups generally include only 3,000 to 4,000 subjects. From a statistical perspective, a population of 30,000 would have to be exposed to the drug to have a 95% chance of detecting an ADE with an incidence of 1 in 10,000 subjects. Therefore, ADEs that occur at a low frequency can be easily missed. In addition, premarketing clinical trials are of relatively short duration. ADEs that develop with chronic use or those that have a long latency period may also escape detection. Study groups often exclude children, women, and the elderly, and are seldom representative of the population exposed to the drug after FDA approval. Finally, the efficacy of a drug is evaluated for only a narrow set of indications and does not extend to the actual evolving use of a drug. Consequently, premarketing clinical trials detect only the most common ADEs. Those occurring more frequently than 1 in 1,000 subjects will be observed and subsequently listed in the product's official labeling at the time of approval. ADEs can range from mild to severe reactions and can lead to hospitalization, permanent disability, or death; and may be classified as Type A or Type B (Table 2-2).

Mechanisms Associated With Type A Reactions

Type A ADEs, with the exception of drug overdose, are associated with the administration of therapeutic dosages of a drug, are usually predictable and avoidable, and are responsible for most ADEs.

Cytotoxic reactions

Most ***cytotoxic reactions*** involve the formation of unstable or reactive metabolites and are related to some abnormality that interferes with the normal metabolism and/or excretion of therapeutic dosages of a drug; cytotoxic reac-

Table 2-1. The Chronology of Testing and Introducing New Drugs

Preclinical Testing (3.5 years)	Clinical Trials (8.5 years)	Postmarketing Surveillance
Laboratory studies • Isolation or synthesis of a new chemical Animal studies • Assess safety and biological activity Pharmaceutical company files an Investigational New Drug (IND) application with the FDA • FDA approval IND reviewed and approved by the Institutional Review Board where the studies will be conducted • Progress reports on clinical trials submitted to FDA annually	Phase I (1 year): • 20 to 80 healthy volunteers • Dosage range • Safety profile Phase II (2 years): • 100 to 300 volunteers with a specific disease • Short-term effectiveness • Adverse drug events Phase III (3 years): • 1,000 to 3,000 volunteers with a specific disease • Long-term effectiveness • Adverse drug events Pharmaceutical company files a New Drug Application (NDA) with the FDA • FDA approval	Monitoring for safety during postmarketing clinical use to determine the true risk-benefit profile of the new drug • Pharmaceutical company must continue to submit periodic reports to the FDA • Case reports of adverse drug reactions • Quality control records • FDA may require additional clinical trials (Phase IV studies)
5,000 potential drugs evaluated	5 drugs are approved for clinical trials	1 drug approved for marketing

tions can also result from a drug overdose. These events lead to the saturation of hepatic enzyme systems. Two main mechanisms underlie the formation of these intermediate compounds during biotransformation: an oxidative pathway, which leads to the formation of electrophilic compounds capable of binding covalently with cellular macromolecules; and a reductive pathway, which gives rise to intermediate compounds with an excess of electrons (free radicals, anionic radicals). These substances react with O_2 and produce reactive metabolites, which overwhelm antioxidant defense systems (superoxide dismutase,

Table 2-2. Classification of Adverse Drug Events

Type A Reactions	Type B Reactions
Predictable	Unpredictable
• Overdose	• Idiosyncratic reactions
• Cytotoxic reactions	• Immunologic/allergic reactions
• Drug-drug interactions	• Pseudoallergic reactions
• Drug-food interactions	• Teratogenic effects
• Drug-disease interactions	• Oncogenic effects

glutathione peroxidase). Covalent binding to proteins and the oxidation of biological macromolecules both lead to direct cytotoxic effects.

Drug-drug interactions

Two or more drugs administered in therapeutic dosages at the same time or in close sequence may (1) act independently, (2) interact to increase or diminish the magnitude or duration of action of one or more drugs, or (3) interact to cause an unintended reaction. Drug-drug interactions may be complex and even unexplained, but they all seem to have either a pharmacodynamic or a pharmacokinetic basis since the same pharmacological mechanisms that account for a drug's efficacy also account for many of its adverse effects.

Pharmacodynamic drug-drug interactions. In pharmacodynamic interactions, the intended or expected effect produced by a given plasma level of a drug in the presence of a second drug is altered. These types of interactions may be characterized as (1) pharmacological interactions, (2) physiological interactions, (3) chemical interactions, or (4) drug-related receptor alterations (Table 2-3).

Pharmacokinetic drug-drug interactions. The duration and intensity of a drug's action is a function of the plasma level of the drug, which is directly related to the drug's rate of absorption, distribution, metabolism, and excretion. One or more of these rates may be altered by concomitant drug therapy resulting in unexpected differences in the plasma levels of a drug (Table 2-4).

Drug-food interactions

An awareness of significant drug-food interactions can help the clinician to identify the nutrients that may interact with certain medications. This information can be used to educate patients and optimize pharmacotherapy.

Interactions affecting absorption. Nutrients may protect the gastric mucosa from irritants, but they may also act as a mechanical barrier that prevents drug access to mucosal surfaces and reduces or slows the absorption of some drugs. Conversely, a meal with high fatty acid content will actually increase the absorption of lipid-soluble drugs. Chemical interactions (i.e., chelating reactions with food components) can produce inactive complexes. The interaction of tetracycline with calcium in milk and other dairy products is an example of a chelating reaction. Similarly, ferrous or ferric salts can bind with tetracyclines and fluoroquinolones, preventing their absorption. An interaction between zinc and fluoroquinolones may also result in the formation of inactive complexes and decreased absorption.

Interactions affecting metabolism. Components in grapefruit juice inhibit the CYP450 3A4 isoenzyme and can greatly increase (up to threefold) the bio-

Table 2-3. Pharmacodynamic Drug-Drug Interactions

Type	Mechanisms	Example(s)
Pharmacological	Drug A and drug B compete for the same receptor site and as a function of their respective concentrations either produce (an agonist) or prevent (an antagonist) an effect	• Opioids vs. naloxone • Acetylcholine vs. atropine • Epinephrine vs. adrenergic receptor–blocking agents
Physiological	Drug A and drug B interact with different receptor sites and either enhance each other's action or produce an opposing effect via different cellular mechanisms	• Cholinergic agents enhance the action of diazepam • Epinephrine opposes the action of histamine • Epinephrine opposes the action of lidocaine
Chemical	Drug A interacts with drug B and prevents drug B from interacting with its intended receptor	• Protamine sulfate inhibits heparin
Receptor alterations	Drug A, when administered chronically, may either increase or decrease the number of its own receptors or alter the adaptability of receptors to physiological events	• α_1-adrenergic receptor agonists down-regulate their own receptors • β_1-adrenergic receptor antagonists up-regulate their own receptors

availability of numerous drugs, such as some calcium channel-blocking agents, benzodiazepines, and warfarin.

Interactions affecting excretion. Changes in the pH of kidney fluids can inhibit excretion of some drugs. For example, large doses of vitamin C (ascorbic acid) may cause acidic drugs to be reabsorbed, delaying excretion and increasing plasma levels of a drug.

Drug-disease interactions

A drug prescribed for the treatment of one disease may have an adverse effect on a different condition that has been generally well controlled. Additionally, certain disease states can interfere with the metabolism and/or excretion of drugs in general.

Pharmacodynamic interactions. Nonselective beta$_1$-adrenergic receptor antagonists, such as propranolol, prescribed for the treatment of chronic stable

Table 2-4. Pharmacokinetic Drug-Drug Interactions

Type	Mechanisms	Example(s)
Interactions affecting absorption	Drug A, by causing vasoconstriction, interferes with the systemic absorption of drug B	Epinephrine vs. lidocaine (or other local anesthetic agents)
	Drug A, by forming a complex with drug B, interferes with the systemic absorption of drug B	Calcium vs. tetracycline
	Drug A, by delaying gastric emptying, delays the systemic absorption of drug B, which is absorbed primarily in the intestine	Opioids vs. acetaminophen
	Drug A, by elevating gastric pH, prevents the absorption of drug B (a weak acid)	Antacids vs. acetylsalicylic acid
Interactions affecting distribution	Drug A (a weak acid), by competing for plasma protein binding with drug B, increases the plasma level of drug B	Acetylsalicylic acid vs. sulfonylureas and many other drugs
Interactions affecting metabolism	Drug A, by increasing or decreasing hepatic microsomal enzyme activity responsible for the metabolism of drug B, increases or decreases the plasma level of drug B, respectively	Macrolides, azole antifungals, and ethanol (chronic use) increase the plasma level of many drugs; H_2-receptor antagonists decrease the plasma level of many drugs
	Drug A, by decreasing hepatic nonmicrosomal enzyme activity responsible for the metabolism of drug B, increases the plasma level of drug B	MAO-inhibitors increase the plasma level of benzodiazepines
	Drug A, by inhibiting the enzyme acetaldehyde dehydrogenase, interferes with the further metabolism of intermediate metabolites (oxidation product) of drug B	Disulfiram and metronidazole inhibit the metabolism of intermediate metabolites of ethanol

(continues)

Table 2-4. Pharmacokinetic Drug-Drug Interactions *(continued)*

Type	Mechanisms	Example(s)
Interactions affecting renal excretion	Drug A, which competes with drug B for the same excretory transport mechanisms in the proximal tubules, increases the plasma level of drug B	Acetylsalicylic acid and probenecid increase the plasma level of penicillin and other weak acids
	Drug A, by alkalizing the urine, decreases the plasma level of drug B	Sodium bicarbonate decreases the plasma level of weak acids
	Drug A, by acidifying the urine, decreases the plasma level of drug B	Ammonium chloride decreases the plasma level of weak bases
Interactions affecting biliary excretion	Drug A, by increasing bile flow and the synthesis of proteins, which function in biliary conjugation mechanisms, decreases the plasma level of drug B	Phenobarbital decreases the plasma level of many drugs
	Drug A binds drug B, which would undergo extensive enterohepatic recirculation, and decreases the plasma level of drug B	Activated charcoal and cholestyramine decreases the plasma level of many drugs

MAO, monoamine oxidase.

angina, hypertension, or cardiac arrhythmia can induce an asthma attack in susceptible individuals by blocking beta$_2$-adrenergic receptors and increasing airway resistance. Beta$_1$-adrenergic receptor antagonists and calcium channel-blocking agents, which can be used for the management of hypertension, chronic stable angina, and certain cardiac arrhythmias, can in some instances precipitate cardiac complications secondary to negative inotropism (decreased contractility), peripheral vasodilatation, and decreased nodal conductance. Beta$_1$-adrenergic receptor antagonists can also adversely affect carbohydrate metabolism and inhibit endogenous epinephrine-mediated hyperglycemic response to excessive insulin levels, thus placing the diabetic patient at risk for hypoglycemia. Cyclooxygenase (COX)-1 inhibitors, e.g., acetylsalicylic acid (ASA), can lead to gastrointestinal bleeding in patients with preexisting peptic ulcer disease. COX-1, COX-2, and COX-3 inhibitors and amoxicillin may induce renal toxicity in patients with preexisting renal dysfunction. Hypothyroidism increases the sensitivity of patients to sedative/anxiolytic agents and opioids, while hyperthyroidism predisposes to epinephrine-induced hypertension and cardiac arrhythmias.

Pharmacokinetic interactions. Hepatic dysfunction can affect drug metabolism and biliary excretion. Renal insufficiency can be expected to impair renal drug elimination. Cardiac disease can often result in reduced metabolic activity in general because of poor oxygenation and organ perfusion. All of these conditions can lead to elevated plasma concentration of drugs and associated adverse drug effects. Patients with congestive heart failure may become symptomatic while on beta$_1$-adrenergic receptor blocking agents because these drugs

decrease cardiac output and reduce glomerular filtration and sodium excretion, increasing the risk of edema. In patients with liver disease, drugs metabolized primarily by the liver (such as acetaminophen) may induce further hepatic dysfunction, even at therapeutic levels, when taken on a long-term basis.

Mechanisms Associated With Type B Reactions

Type B ADEs are generally independent of the dose and are rarely predictable or avoidable. While they are uncommon, type B reactions are often among the most serious and potentially life threatening of all ADEs and they are the major cause of important drug-induced illness.

Idiosyncratic reactions

Drug metabolism is largely dominated by oxidation reactions catalyzed by the CYP450 enzyme system. There are 10 isoforms of the CYP450 enzyme system and this genetic polymorphism may lead to significant differences in the efficacy and toxicity of drugs. The effect of genetic polymorphism on catalytic activity is most prominent for five isoforms (CYP1A2, CYP2C9, CYP2C19, CYP2D6, and CYP3A4). CYP3A4 alone is involved in the metabolism of about half of all drugs currently prescribed (Table 2-5). Drugs that are substrates of the same CYP isoenzyme (i.e., metabolized by the same isoenzyme) may competitively inhibit each other. Other drugs may inhibit or induce CYP isoenzyme activity without being substrates. The therapeutic consequences of this genetic polymorphism will depend on the intrinsic character of the drug, on the importance of the deficient metabolic pathway in the overall metabolism of the drug, and on the possible existence of alternative metabolic pathways.

Allergic/immunologic reactions

A familial predisposition to drug allergy has been reported, and it is suggested that specific HLA genes are involved in the reaction to at least some drugs. In susceptible patients, alkylation and/or oxidation of cellular macromolecules by drug metabolites may lead to the production of antigens. The production of antigens is patient dependent, clearly not related to the dose administered, and is unpredictable. Allergic reactions to drugs are characterized by specificity to a given agent, transferability by antibodies or lymphocytes, and recurrence when reexposure to the offending drug occurs. Most allergic reactions to drugs tend to occur in young or middle-aged adults; drug allergy is observed twice as frequently in women as men.

Table 2-5. Important Relationships Between Drugs Prescribed by Oral Health Care Providers and CYP Enzymes

CYP Isoenzymes	Substrates	Inhibitors	Inducers
CYP2C9	Ibuprofen	Fluconazole	
CYP2C19	Diazepam		
CYP2D6	Codeine Hydrocodone		
CYP3A4	Erythromycin Clarithromycin Alprazolam Midazolam Triazolam	Erythromycin Clarithromycin Fluconazole Ketoconazole Itraconazole	Carbamazepine

Type I (immediate) hypersensitivity reactions. Exposure to an allergen results in antigen-specific antibody production dominated by the immunoglobulin E (IgE) isotype. IgE antibodies bind to mast cells, basophils, and eosinophils associated with mucosal and epithelial tissues. The simultaneous binding of an antigen to adjacent IgE molecules fixed to Fc receptors triggers degranulation of mast cells and basophils, resulting in the production and release of histamine, leukotrienes, prostaglandins, chemokines, enzymes, and cytokines (Figure 2-1). Histamine produces peripheral vasodilatation and increased capillary permeability. Leukotrienes and prostaglandins promote smooth muscle contraction, increased vascular permeability, and increased mucous secretion. Chemokines attract leukocytes, enzymes break down tissue matrix proteins, and the cytokines promote inflammatory activities in target tissues.

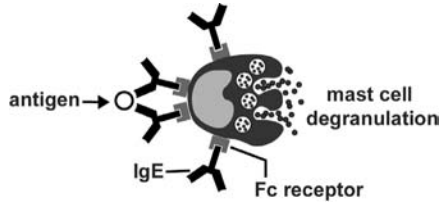

Figure 2-1. Type I (immediate) hypersensitivity reaction.

Type II (cytotoxic) hypersensitivity reactions. IgG antibodies mediate the basic cytotoxic immune reaction. The antibodies bind to antigen-coated host cells, followed by complement activation and cell lysis induced by the active by-products of the complement cascade (Figure 2-2).

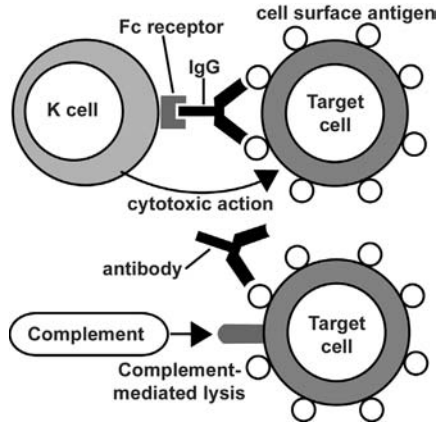

Figure 2-2. Type II (cytotoxic) hypersensitivity reaction.

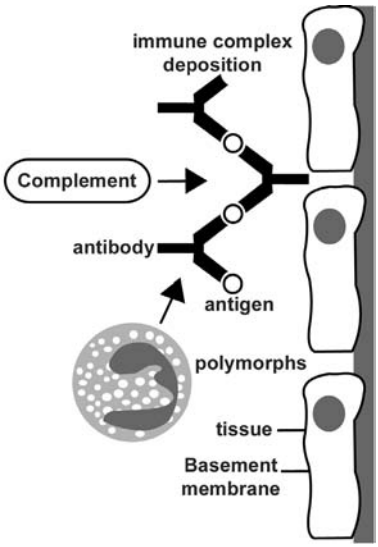

Figure 2-3. Type II (immune-complex) hypersensitivity reaction.

Type III (immune-complex) hypersensitivity reactions. Immune-complex reactions are also mediated by IgG antibodies and result in the formation of large, insoluble antigen-antibody complexes (Figure 2-3). These immune complexes adhere to target tissues, initiate intense complement activation, aggregate leukocytes and platelets to form thrombi and occlude arterioles, and produce either localized or systemic complications.

Type IV (delayed) hypersensitivity reactions. Delayed reactions are closely related to cellular immunity in that spe-

cifically sensitized $CD4+$ T lymphocytes initiate the reaction (Figure 2-4). Initial sensitization occurs slowly, over a 10-day to 14-day period. Small molecular weight drugs bind covalently to host cell membrane proteins or ***hapten-carrier conjugates***. A subsequent exposure causes the immunologically committed lymphocytes to react with the allergen (antigens) and release cytokines (lymphokines), which activate macrophages and amplify the inflammatory response.

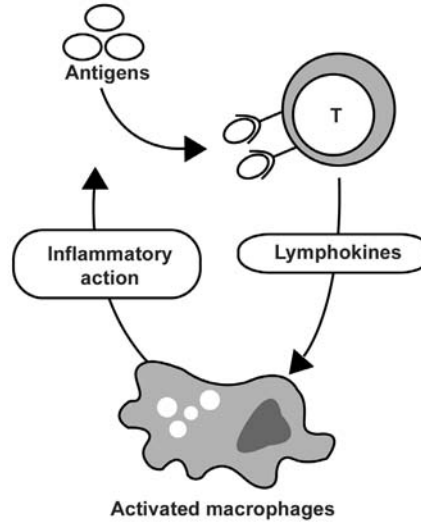

Figure 2-4. Type IV (delayed) hypersensitivity reaction.

Pseudoallergic reactions

Pseudoallergic reactions cannot be explained on an immunologic basis. These ADEs occur in patients who had no prior exposure to the drug. Penicillin, codeine, morphine, and vancomycin directly activate mast cells through non-IgE receptor pathways and initiate the release of histamine and other bioactive mediators. Angiotensin-converting enzyme (ACE) inhibitors block the degradation of vasoactive substances such as bradykinin and prostaglandin. COX-1 inhibitors, by inhibiting the activity of cyclooxygenase, increase the production of leukotriene-related metabolic products.

Teratogenic/developmental effects

Teratogens are substances capable of causing physical or functional disorders in the fetus in the absence of toxic effects on the mother. Direct teratogenic effects depend on the achievement of drug or metabolite concentrations in the fetus at a critical time period, especially from the third to the twelfth week of gestation.

Oncogenic effects

Oncogenic effects associated with drug therapy may be primary or secondary. ***Primary oncogenic effects*** may be produced by certain procarcinogenic drugs, which are converted into carcinogens by polymorphic oxidation reactions. Covalent binding of these reactive metabolites to DNA leads to mutagenic and carcinogenic effects. ***Secondary oncogenic effects*** are associated with therapeutic immunosuppression, leading to the reactivation of latent infection with oncogenic viruses (i.e., hepatitis B virus [HBV], hepatitis C virus [HCV], cytomegalovirus [CMV], herpes simplex virus [HSV], human papillomavirus [HPV], and the Epstein-Barr virus [EBV]).

CLINICAL MANIFESTATIONS OF ADVERSE DRUG EVENTS

Type A Reactions

Cytotoxic effects

Hepatocellular toxicity. Drug-induced liver injury is a potential complication of nearly every medication that is prescribed. One such drug, acetamino-

phen (APAP), is metabolized primarily by conjugation into inactive metabolites. When the capacity of conjugation reactions is exceeded, the CYP2E1 enzyme is activated and a highly reactive intermediate metabolite is synthesized. While it can be detoxified through glutathione-mediated conjugation, depletion of glutathione (excessive doses of APAP [more than five therapeutic doses in a 24-hour period], malnutrition, and ethanol abuse) allows the reactive metabolite to accumulate and bind covalently to cellular macromolecules and disrupt hepatic cell function. Clinical signs and symptoms of APAP overdose include nausea, vomiting, anorexia, and abdominal pain. A few days later, elevated bilirubin presents as jaundice (see Insert, Figures 2-5 and 2-6).

Cytotoxic mucositis. Cancer chemotherapeutic agents produce extensive injury to certain cancer cells, but they are not selectively tumoricidal and may arrest the growth and maturation of normal cells. The degree of toxicity usually depends on the specific agent, dosage, schedule and route of administration, and patient-related predisposing factors. Mucositis appears clinically as erythematous or diffuse ulcerative lesions. Certain chemotherapeutic agents are more stomatotoxic than others, and chemotherapy-related mucositis may contribute to systemic infection by odontopathic, periodontopathic, and transient oral microorganisms. Other drugs may also produce cytotoxic reactions that affect oral soft tissues (see Insert, Figures 2-7 to 2-11).

Gastrointestinal disturbances

Nausea and vomiting. The physiologic purpose of nausea is to prevent food intake; that of vomiting is to expel food or other toxic substances present in the upper part of the gastrointestinal tract. The vomiting center, located in the brain, is the origin of the final common pathway along which different impulses induce emesis. The second important medullary site is the chemoreceptor trigger zone. The chemoreceptor trigger zone is outside the blood-brain barrier and, thus, it is accessible to drugs circulating either in the blood or in the cerebrospinal fluid. The vomiting center, activated by impulses that originate in the chemoreceptor trigger zone, induces nausea and vomiting. Protracted vomiting may cause electrolyte imbalance, dehydration, and malnutrition syndrome, and may result in mucosal laceration and esophageal hemorrhage.

Opioid analgesics can either induce or block emesis. Both the emetic and antiemetic action can be blocked by naloxone (an opioid antagonist), which suggests that both effects are mediated by opiate receptors. Studies using selective opiate-receptor agonists suggest that the delta and/or kappa receptors are the emetic receptors and the mu receptors mediate an antiemetic effect. In addition, dopamine (D_2), histamine (H_1), muscarinic, and serotonin ($5\text{-}HT_3$) receptor agonists have been implicated in causing nausea and vomiting.

Constipation. Constipation may be defined as the passage of excessively dry stool, infrequent stool, or stool of insufficient size. It involves the subjective sensations of incomplete emptying of the rectum, bloating, passage of flatus, lower abdominal discomfort, anorexia, malaise, headache, weakness, and giddiness. Constipation may be of brief duration (e.g., when one's living habits and diet change abruptly) or it may be a lifelong problem. The administration of many drugs (anticholinergic drugs found in many over-the-counter medications, antiparkinsonian drugs with anticholinergic properties, antihistamines, neuroleptics, antidepressants, anticonvulsants, opioid analgesics, and antacids) may lead to constipation.

Diarrhea. Diarrhea and associated fecal urgency and incontinence may be defined as passage of liquefied stool with increased frequency. Chronic diarrhea

may be due to lactose intolerance, inflammatory bowel disease, malabsorption syndromes, endocrine disorders, irritable bowel syndrome, and the abuse of laxatives and antacids. Infection (viral or bacterial), toxins, or drugs such as antibacterial agents are the usual causes of acute diarrhea.

Urinary incontinence

Urinary incontinence caused by medications can be attributed to a number of mechanisms. Diuretics cause incontinence by increasing urinary flow. Other drugs cause this problem as a result of overflow, stemming from urinary retention. Drugs acting in this manner include anticholinergic agents and adrenergic agonists, such as ephedrine and theophylline. Other agents affecting incontinence are sedative-hypnotics, anxiolytics, neuroleptics, opioids, and sialagogues.

Mood alterations

Several agents have been implicated in causing depression in susceptible patients. Depression is a frequent consequence of treatment with antihypertensive agents, beta-adrenergic antagonists, cardiac glycosides, benzodiazepines, barbiturates, levodopa, indomethacin, phenothiazines, and steroids. Delirium (acute confusional states) in some cases may also be attributed to drug therapy. The primary offending agents include anticholinergic agents, psychotropics, cardiac glycosides, opioids, and sedative-hypnotic agents.

Cardiovascular dysfunction

Several drugs can have adverse effects on cardiovascular function. Orthostatic hypotension occurs when there is a positionally related drop in the blood pressure, putting the patient at risk for syncope. Drugs known to produce orthostatic hypotension include antihypertensive agents, antidepressants and other psychotropic agents, alcohol, and levodopa. Digoxin, a drug used to treat congestive heart failure and atrial arrhythmias, is also associated with causing cardiac arrhythmias. Macrolide antibiotics are also known to cause cardiac arrhythmias (QT interval prolongation); this cardiac effect is amplified in combination with some calcium channel blockers, azole antifungal agents, and protease inhibitors because of CYP3A4 isoenzyme inhibition. The serious consequence of this interaction is the torsade de pointes ventricular arrhythmia.

Equilibrium problems

Patients at increased risk for falls include those with decreased vision, impaired mobility and cognition, postural hypotension, and peripheral neuropathy. The administration of certain drugs to an individual so predisposed may contribute to falls. Drugs commonly implicated in falls include benzodiazepines, antidepressants, neuroleptics, barbiturates, phenytoin, antiarrhythmic agents, and alcohol.

Xerostomia

Qualitative and quantitative changes in saliva lead to reduced lubrication; antibacterial, antiviral, and antifungal activity; loss of mucosal integrity; loss of buffering capacity; reduced lavage and cleansing of oral tissues; interference with normal remineralization of teeth; and altered digestion, taste, and speech. The major classes of drugs causing xerostomia include anticholinergic agents, antidepressants, antihypertensive agents, antipsychotics, diuretics, antihistamines, central nervous system stimulants, systemic bronchodilators, and a small number of cancer chemotherapeutic agents. The consequence of long-term salivary gland hypofunction is an increased risk for periodontal disease and root surface caries. Altered salivary flow and composition may be important

predisposing factors to oral candidiasis, and reduced salivary amylase and IgA levels may be associated with an increased incidence of oral infections with opportunistic bacterial pathogens (see Insert, Figures 2-12 to 2-15).

Bleeding diatheses

Acetylsalicylic acid (ASA) acetylates cyclooxygenase, which results in the inhibition of platelet thromboxane A_2 biosynthesis. This reduces the ability of platelets to stick or clump together and form a clot. Because platelets lack the ability to synthesize new proteins, the defect induced by aspirin cannot be repaired during their life span. Therefore, after treatment with ASA is stopped, cyclooxygenase activity recovers slowly (4 to 7 days) as a function of platelet turnover. Clopidogrel, a thienopyridine, inhibits adenosine diphosphate receptor–mediated platelet activity. Clopidogrel added to ASA can further increase the potential for bleeding.

The oral anticoagulant warfarin reduces clot formation by inhibiting the formation of vitamin K–dependent clotting factors, primarily Factor VII. The parenteral anticoagulant heparin interferes with the activities of Factors II and X. The most common side effect of both warfarin and heparin is hemorrhage. Hemorrhages may present clinically as gingival bleeding or submucosal bleeding with hematoma formation. Cancer chemotherapeutic agents may secondarily induce profound thrombocytopenia ($<$20,000 mm^3). Hemorrhage may occur anywhere in the mouth and may be spontaneous or precipitated by trauma or existing disease (see Insert, Figures 2-16 to 2-20).

Bacterial infections

If a patient complains of diarrhea with lower abdominal cramping and is currently taking, or has taken in the recent past, clindamycin or a broader spectrum penicillin or cephalosporin, the clinician must consider the possibility of a bacterial superinfection. The worst presentation of a bacterial superinfection is pseudomembranous colitis associated with an overgrowth of *Clostridium difficile* in the gastrointestinal tract. Bacterial infections often contribute to morbidity and mortality in association with therapeutic immunosuppression. A wide range of bacteria, including odontopathic, periodontopathic, and transient pathogens of the oral flora may manifest as ulcerative lesions. The normal signs of infection are not always obvious, with pain, fever, and the presence of a lesion observed most consistently (see Insert, Figure 2-21).

Fungal infections

Antibacterial chemotherapy and therapeutic immunosuppression, including inhaled corticosteroids, are often complicated by infection with *Candida albicans* and other fungal organisms. Oral candidiasis may appear as white, raised, or cottage cheese–like growths that can be scraped off, leaving a red and sometimes hemorrhagic base. Candidiasis may also appear as an erythematous lesion under dental prostheses. Once pathogenic, *C. albicans* may spread to the esophagus or lungs via deglutition or droplet aspiration, or through the hematological route. Eventually, all organ systems may be affected (see Insert, Figures 2-22 and 2-23).

Viral infections

Herpes simplex virus infections. Clinical manifestations of recurrent herpes simplex virus (HSV) infections in patients undergoing therapeutic immunosuppression may be observed on the lips and intraorally on all tissues. The

ulcerations are quite painful. The optimal period of observation for the detection of recurrent HSV infections is during the 7- to 14-day period following the administration of chemotherapy. Primary HSV infections appear to account for fewer than 2% of infections in these patients (see Insert, Figure 2-24).

Varicella zoster virus infection. Recurrent infection with the varicella zoster virus (VZV), known as herpes zoster, is a painful, unilateral vesiculation that may follow the distribution of a branch of the trigeminal nerve. The lesions coalesce into large ulcerations and may linger for weeks before remission occurs (see Insert, Figures 2-25 and 2-26).

Epstein-Barr virus infection. Infection with the Epstein-Barr virus (EBV) has been associated with a wide range of syndromes in solid organ transplant recipients. In the oral cavity, the EBV has been causally related to hairy leukoplakia, characteristically found on the lateral border of the tongue in patients with therapeutic immunosuppression (see Insert, Figure 2-27).

Gingival hyperplasia

Gingival hyperplasia (GH) in patients taking phenytoin has long been recognized. GH also occurs in patients treated with cyclosporine (an immunosuppressive agent) and calcium channel–blocking agents. The mechanisms responsible for GH are unknown, but they may be related to calcium metabolism and the inflammatory changes resulting from poor oral hygiene. Gingival enlargement is usually noted within 1 to 2 months after the initiation of therapy and appears to affect primarily the labial/facial interdental papillae. While the enlarged tissue may be firm and painless, it is often associated with erythematous and edematous chronic inflammation. The patient may report pain, gingival bleeding, and difficulty with mastication as a result of the hyperplastic tissue. (See Insert, Figures 2-28 to 2-30.)

Neurological complications

Oral pain. Oral pain may be secondary to drug-induced mucositis. During therapeutic immunosuppression, acute exacerbations of chronic periodontal or apical infections can also precipitate pain. Finally, pain or paresthesia may be associated with the administration of certain cytotoxic chemotherapeutic agents (i.e., the plant alkaloids, vinblastine and vincristine).

Tardive dyskinesia. Tardive dyskinesia (TD) is an example of an adverse drug effect produced by certain psychotropic drugs. It is characterized by uncontrolled, repetitive movements of the lips, tongue, and mouth, which may occur after several months on the drug. It is irreversible and can impair the ability of a patient to wear dental prostheses and complicate the delivery of routine dental care.

Taste alterations. Many drugs, including ACE inhibitors, griseofulvin, phenindione, D-penicillamine, metronidazole, benzodiazepines, methamphetamines, levodopa, chlorhexidine, methocarbamol, dimethyl sulfoxide, gold salts, and lithium have been implicated in dysgeusia. The mechanism of action in taste alteration is poorly understood, but may be associated with drug effect on trace metals.

Inadequate nutrition

Drug therapy may compromise the nutrition and caloric intake of the patient by inducing nausea and anorexia. Excessive nutrients may be lost to vomiting and diarrhea. Enteritis, malabsorption, and impaired liver function further interfere with the nutritional status of the patient. The cytotoxic effects of chemotherapeutic agents on the oral mucosa also predispose the patient to pain,

difficulty in mastication, and dysphagia. Altered or reduced taste associated with many drugs further contributes to inadequate intake of food.

Type B Reactions

Idiosyncratic reactions

An unusual reaction of any intensity observed in a small percentage of the patients is referred to as ***idiosyncrasy***. If a drug produces its usual effect on a patient at an unexpectedly high dose, the patient is said to be ***hyporeactive***. A patient is said to be ***hyperreactive*** when a drug produces its effect at an unexpectedly low dosage. Some of this diversity in rates of response can be attributed to differences in the rate of drug metabolism. Among the various CYP450 enzymes, CYP2D6 has been studied the most extensively and various phenotypes have been identified. Patients who lack CYP2D6 activity will exhibit poor metabolism of certain drugs; patients who have normal enzyme activity will exhibit normal metabolism; those with reduced activity will exhibit intermediate metabolism; and those with markedly enhanced enzyme activity will exhibit ultrarapid metabolism. If the consequence is reduced drug metabolism, it leads to excessive therapeutic effects and associated adverse reactions. If the consequence is accelerated metabolism, it results in insufficient therapeutic response.

The CYP2D6 enzyme is involved in the metabolism of more than 100 drugs. In most cases, this results in deactivation of the drug; however, in the case of codeine, this metabolic pathway leads to the conversion of the prodrug (codeine) into its active metabolite. The CYP2D6 enzyme converts codeine to morphine, a crucial step in bioactivation, since the affinity of codeine for the mu-opioid receptor is only 1/200th to 1/3000th that of morphine. The analgesic, respiratory, psychomotor, and miotic effects of codeine are markedly attenuated in people with poor metabolism by the CYP2D6 enzyme. Conversely, for people with ultrarapid metabolism, the greater amount of morphine being produced will result in exaggerated pharmacologic effects and may lead to life-threatening opioid intoxication. The frequency of the phenotype associated with poor metabolism is 5% to 10% of the white population. Similarly, the frequency of the phenotype associated with ultrarapid metabolism is also 5% to 10%.

Allergic/immunologic reactions

Type I (immediate) hypersensitivity reactions. The IgE-mediated reaction is experienced within minutes of exposure to a specific drug. Examples of signs and symptoms include hives and urticaria, bronchoconstriction, hypotension, and shock. Involvement of the nasopharynx and upper airway results in allergic rhinitis. Involvement of the oropharyngeal area can lead to angioedema. Rapid detection of signs and symptoms with immediate intervention is necessary to prevent serious complications and death (see Insert, Figures 2-31 to 2-33).

Type II (cytotoxic) hypersensitivity reactions. Antibody titer may take 7 to 12 days to rise after exposure to the antigen before a significant fever, urticaria, swelling of the face and feet, lymphadenopathy, and arthralgia occur. These effects may be transient and insignificant, and the patient is usually able to tolerate the reaction without necessity for allergy therapy. A clinical example of this type of allergic reaction is drug-induced hemolytic anemia.

Type III (immune-complex) hypersensitivity reactions. Immune complexes adsorb to host tissue, initiate intense complement activation, and produce

either localized (cutaneous vasculitis) or systemic complications (serum sickness). Deposition of immune complexes can be observed in biopsy specimens, which demonstrate an irregular (lumpy-bumpy) layer of antibody/complement-coated host tissue (see Insert, Figures 2-34 and 2-35).

Type IV (delayed) hypersensitivity reactions. Sensitization occurs at the time of initial exposure to a drug. A subsequent exposure causes the immunologically committed lymphocytes to react with the drug and release lymphokines, which initiate an inflammatory response. Within 24 to 28 hours, the patient develops symptoms such as fever, malaise, erythema, and edema in target tissues. With repeated exposure to the antigenic challenge, the response becomes more profound (see Insert, Figures 2-36 to 2-39).

Pseudoallergic reactions

The clinical manifestations of pseudoallergic reactions are similar to those associated with allergic reactions. A classic example of such reactions is the patient who gets hives after being administered penicillin, codeine, morphine, or vancomycin. ACE inhibitors block kinin degradation and induce angioedema, and COX-1 inhibitors can cause asthma and hives by inhibiting the activity of cyclooxygenase and increasing the production of leukotriene-related metabolic products (see Insert, Figures 2-40 and 2-41).

Lichenoid stomatitis

The clinical appearance of lichenoid stomatitis is indistinguishable from oral lichen planus (LP). Like oral LP, these lesions most often affect the buccal mucosa, gingivae, and lateral borders of the tongue and may be reticular, erythematous, or atrophic. Various drugs including diuretics (thiazides, furosemide, spironolactone), $beta_1$-adrenergic receptor-blocking agents (labetalol, propranolol), ACE-inhibitors (captopril), and COX-1 inhibitors have been implicated as etiologic agents in the development of lichenoid lesions. It is believed such agents act as haptens and alter the antigenicity of epithelial self-antigens. The diagnosis is confirmed when the condition resolves after the offending drug is discontinued (see Insert, Figures 2-42 and 2-43).

Erythema multiforme and Stevens-Johnson syndrome

Erythema multiforme (EM) is an acute, frequently recurrent mucocutaneous vesiculobullous erosive disorder. Typically a self-limiting process, severity varies from mild (EM minor) to moderate (EM major) to potentially fatal Stevens-Johnson syndrome and toxic epidermal necrolysis. The oral mucosa is most frequently involved; ocular and genital involvement is seen in more severe forms. While any oral site may be involved, lesions on the unattached mucosal tissues predominate and hemorrhagic crusting of the lips is highly characteristic and virtually pathognomonic. Ocular involvement manifests as conjunctivitis, periorbital edema, and photophobia. Most mucocutaneous lesions tend to heal completely in 2 to 6 weeks. In severe cases, scarring and permanent visual impairment may ensue. Fatal forms are rare ($<1\%$) (see Insert, Figures 2-44 to 2-49).

Teratogenic/developmental effects

Drug-related developmental toxicity may produce altered growth (terata), growth retardation, functional deficits or impairments, and death of the fetus. Behavioral teratogens disrupt normal behavioral development after prenatal exposure. Fetal abnormalities in the United States occur in 3% to 6% of pregnan-

cies and drugs are considered to be responsible for 1% to 5% of these malformations.

Oncogenic effects

Malignancies of the skin and lips. Skin and lip malignancies are the most frequent to develop following therapeutic immunosuppression. The reported incidence of lip cancer in organ transplant patients varies from 7.0% to 8.1% (versus 0.3% in the general population). The average age of patients is 42 years and the mean latency from transplantation to malignancy is 5.3 years. Most squamous cell carcinomas (SCCs) are low grade but a significant percentage behaves aggressively, with lymph node metastasis in 5.8% of the cases, leading directly to the death of 4.9% of all transplant patients (versus 1% to 2% in the general population) (see Insert, Figure 2-50).

Kaposi sarcoma. The incidence of Kaposi sarcoma (KS) following therapeutic immunosuppression in organ transplant recipients is 5.6% (compared to 0.02% to 0.07% in the general population). Sixty percent of the patients have KS confined to skin, conjunctiva, or oropharyngeal mucosa. In addition, 24% of patients with visceral KS have no skin involvement but 3% have oral involvement (see Insert, Figure 2-51).

Lymphoproliferative disease, Hodgkin and non-Hodgkin lymphoma, leiomyoma, leiomyosarcoma, and spindle-cell sarcoma. Lymphoproliferative disease, Hodgkin and non-Hodgkin lymphoma, leiomyoma, leiomyosarcoma, and spindle-cell sarcoma have been associated with therapeutic immunosuppression in solid organ transplant recipients. Lymphoproliferative disease is the most severe and can be life threatening (see Insert, Figures 2-52 to 2-55).

PREVENTING ADVERSE DRUG EVENTS

Preventing ADEs is a critical part of clinical practice. Oral health care providers must have an awareness of and have access to information related to ADEs. To minimize such events, they must develop a rational approach to the use of pharmacotherapeutic agents in the management of oral/odontogenic problems.

Accurate Diagnosis

Meticulous documentation of the patient's medical history and an appropriate physical examination are germinal to establishing the correct diagnosis. Unfortunately, the establishment of an accurate diagnosis before the initiation of therapy is not always possible, which may lead to inappropriate therapeutic intervention.

Critical Assessment of the Need for Pharmacotherapy

In the management of most oral/odontogenic conditions, nonpharmacological intervention (primary dental care) is a more appropriate and safer alternative to pharmacotherapy. Practitioners must avoid "rationalized activism." The rational activist assumes that it is better to overtreat than not to treat at all.

Benefits Versus Risks of Drug Therapy

Benefits should always outweigh the risks when a drug is prescribed. If clinicians were to observe this basic principle routinely, then the number of unnecessary or inappropriate prescriptions would be reduced, thus minimizing the number of patients at risk. Avoid "reflex prescribing." The reflex prescriber caters to the patient's expectations.

Individualization of Drug Therapy

Individualization of drug therapy involves the consideration of both drug-related and patient-related variables. Drug-related factors, in addition to the choice and dosage of a drug, should include consideration of the route of administration, formulation, and other drugs the patient may be taking. A review of patient-related variables must include genetic factors, age, sex, race, weight, occupation, lifestyle, and systemic disease. Errors in medications, which may lead to ADEs, are related to such factors as progressing age, multiple illnesses, living alone, and poor coping ability of ambulatory patients with their environment.

Patient Education

Take time to explain the role of drugs in the treatment of a disease. Pay special attention to impaired intellect, poor vision, and diminished hearing. Simple and clear instructions on how and when to take drugs should be given both by the clinician and the pharmacist, reinforced by clear labeling of containers and written instructions on the patient's own drug report card. Special labels are available for blind or poorly sighted patients.

Continuous Reassessment of Therapy

Assess the patient's response frequently for efficacy, ADEs, and compliance. Adjust dosages as may be required and discontinue unnecessary medications. When new signs and symptoms are reported, rule out drug-induced etiology. Mild and chronic disorders that require prophylactic therapy, disorders in which the consequences of stopping therapy may be delayed, complex regimens, and frequent dosing lend themselves to noncompliance. A by-product of poor compliance is hoarding of drugs. This phenomenon can further contribute to noncompliance and ADEs because patients may confuse new bottles with old ones, take medications that have deteriorated with age, or use hoarded drugs for the wrong purpose.

DIAGNOSING ADVERSE DRUG EVENTS

The diagnosis of ADEs is highly subjective and imprecise. Symptomatic complaints that may be assumed to be drug induced, such as fatigue, inability to concentrate, and excessive sleepiness, have been reported by healthy individuals not taking any medications. In another study, investigators found that 58% of the patients receiving a placebo complained of one or more ADEs. However, drugs as disease-producing and symptom-producing agents should always be considered in the formulation of a differential diagnosis, and a stepwise process can be helpful in assessing possible drug-related adverse events (Table 2-6).

Table 2-6. A Stepwise Process to the Diagnosis of ADEs

Step 1	Identify the drug(s) taken by the patient.
Step 2	Verify that the onset of signs and symptoms was after the initiation of pharmacological intervention.
Step 3	Determine the time interval between the initiation of drug therapy and the onset of ADEs.
Step 4	Stop drug therapy and monitor the patient's status.
Step 5	If appropriate, restart drug therapy and monitor for recurrence of ADEs.

ADE, adverse drug event.

Table 2-7. Reporting Serious ADEs

FDA Form 3500	
Web site	Go to: http://www.fda.gov/medwatch/report/hcp.htm • Complete and submit Form 3500 **online**, *or* • Download a copy of Form 3500 and **fax** the completed form to 1-800-FDA-0178, *or* • Download a copy of Form 3500 and **mail** back the completed form using the postage-paid, addressed envelope form
Phone	Call **1-800-FDA-1088** to report by telephone

ADE, adverse drug event.

REPORTING ADVERSE DRUG EVENTS

The FDA has the regulatory responsibility for ensuring the safety of all marketed drugs. Drug manufacturers are required by federal regulations to notify the FDA of adverse events of which they are aware; however, the success of any surveillance program is dependent on active participation by individual clinicians. In an effort to increase awareness to the extent of drug-induced adverse events, the Commissioner of the FDA launched MEDWatch, an initiative designed to educate health care professionals about the critical importance of being aware of, monitoring for, and reporting ADEs. It is not necessary to prove causality; a suspected association constitutes sufficient reason to report. Reports may be sent directly to the FDA by several different mechanisms (Table 2-7). Based on these reports, the FDA may send out letters to health care professionals notifying them of the ADE; require warning labels or changes to the drug name or packaging; require further epidemiological investigations and/or manufacturer-sponsored postmarketing studies; conduct inspections of manufacturers' facilities and/or records; or require that the drug be withdrawn from the market.

CONCLUSION

ADEs evolve through the same physiological and pathological pathways as normal disease and are difficult to distinguish. Prerequisites to considering ADEs in the differential diagnosis of a patient's disease or clinical symptoms include an awareness that an ever-increasing number of patients are taking more and more medications (polypharmacy); recognition that many drugs will remain in the body for weeks after therapy is discontinued; clinical experience; and familiarity with relevant literature about ADEs. It is equally important to recognize that some ADEs occur rarely, and detection based on clinical experience or reports in the medical literature is impossible at times. However, timely reporting of ADEs can save lives, reduce morbidity, and decrease the cost of health care.

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3 Medical Management of Odontogenic Pain

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INTRODUCTION

The most common complaint causing a person to seek the services of an oral health care provider is pain. Consequently, the primary obligation and ultimate responsibility of every clinician is not only to restore function but also to relieve pain. Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage. Proper management of pain requires an understanding of its complexity, an appreciation for the factors that determine its expression in the clinical setting, and the implementation of sound clinical and pharmacological strategies.

ETIOLOGY AND EPIDEMIOLOGY

Activation of Nociceptive Pain Pathways

Nociception is the activation of primary sensory nerve fibers (nociceptors) by noxious stimuli (i.e., mechanical perturbations, intense temperatures, and chemicals) that are transduced into electrical potential. Nociceptors have free nerve endings in skin, mucosa, deep soma, and viscera. Nociceptor cell bodies are located in the trigeminal ganglion for innervation of the face. Nociceptors transmit electrical impulses from the periphery to the trigeminal ganglion where the information is processed through synaptic circuitry and transmitted to various parts of the brain. Because nociceptors transmit information toward the brain, they are called ***afferent neurons***.

Tissue damage is the primary stimulus for nociceptor activation. Chemical agents released by injured cells (e.g., serotonin, histamine, bradykinin, prostaglandins, and other neuroactive substances) lead to nociceptor activation. Activated nociceptors release substance P and calcitonin gene-related peptide (CGRP) which initiate the inflammatory response to promote healing. Blood vessel dilation promotes the recruitment of immunocompetent cells. Mast cell degranulation releases histamine and serotonin, further increasing nociceptor sensitization and the generation of action potentials in afferent neurons.

Based on the degree of myelination, neurons are classified as A-fibers (alpha, beta, gamma, and delta subgroups), B-fibers, and C-fibers. A- and B-fibers are myelinated, whereas C-fibers are unmyelinated. Information generated by nociceptors are carried in afferent A delta– and C-fibers. Information delivered via A delta–fibers is transmitted rapidly to the central nervous system (CNS) and permits the perception of sharp, bright, well-localized (first) pain that is not particularly persistent but is immediately associated with tissue injury. Information delivered via C-fibers is transmitted to the CNS slowly and permits the perception of burning, aching, dull, and poorly localized, but persistent (second) pain.

Primary afferent nociceptors have cell bodies in the trigeminal nucleus or medullary dorsal horn (MDH) where they synapse with secondary afferent neurons. The neurotransmitter for primary afferent neurons is glutamate. The secondary afferent neurons travel to the thalamus, where they synapse with tertiary afferent neurons that have projections to the somatosensory cortex (localization of pain) and the limbic system (emotional aspects of pain).

Intrinsic Modulation of Nociception

Amplification

After tissue injury, as macrophages and other cells of the immune system invade the damaged area in an attempt to remove cell debris and to prevent

or combat infection, the inflammatory process promotes the formation of prostaglandins, which enhance the effects of other algogenic substances on pain receptors. Tissue injury may also provoke an efferent sympathetic reflex, which decreases microcirculation in the area, producing ischemia and amplifying nociception at peripheral afferent terminals.

Inhibition

Inhibition of nociception can also occur at peripheral terminals of afferent nerves. Such effects are particularly prominent in painful inflammatory conditions, as resident immune cells in inflamed tissue express their endogenous ligands, opioid peptides. Corticotropin-releasing hormone and cytokines stimulate the release of these opioid peptides, resulting in local analgesia. Similarly, simultaneous activity in large myelinated fibers can modulate small-fiber transmission by activating inhibitory cells in the MDH.

Central control systems, by means of ***efferent fibers***, can further inhibit signal transmission. A pain modulation pathway extends from the periaqueductal gray to the raphe magnus. High-density projections from the raphe magnus to the trigeminal nucleus contain substance P terminals and opiate receptors. Within this same region, there are small interneurons, which contain and, on activation, release endogenously produced opioid peptides (enkephalins, endorphins, and dynorphins).

Perception of Pain

The term ***perception*** when applied to pain refers to the awareness of a noxious sensation and the interpretation and attribution of meaning to the experience. While patients are surprisingly uniform in their perception of pain, they differ greatly in their reactions to it. Attention and cognition, along with cultural, emotional, and motivational differences, will alter or modulate the intensity of a patient's response to noxious stimuli.

Odontogenic Pain

Complaints of anguish, postural displays, groaning, wincing, and grimacing are all equated with pain, along with limitation of normal activity (function), excessive rest, social withdrawal, and demand for medication. Most patients can attain satisfactory relief of odontogenic pain through an approach that incorporates primary dental care in conjunction with local anesthetics and the administration of analgesics.

LOCAL ANESTHETIC AGENTS

Local anesthetic agents (LAs) are nonspecific inhibitors of peripheral sensory, motor, and autonomic pathways. They inhibit the conduction of action potentials in all afferent and efferent neurons such that sensory information is not transmitted effectively to the brain and motor impulses are not transmitted effectively to muscles. Consequently, the sequential loss of pain and temperature, proprioception, touch and pressure, and ultimately motor functions is typical. The ideal LA should provide profound reversible local anesthesia with rapid onset, satisfactory duration of action, and minimal adverse local or systemic effects.

Cocaine, a plant alkaloid found in the leaves of *Erythroxylon coca*, was the first LA to be discovered. However, cocaine's untoward properties of CNS excitation and mood alteration, profound cardiac stimulation, intense vasocon-

strictive properties, and the development of psychological and physical dependence, preclude its use in routine clinical practice.

Currently available LAs have three structural domains: an aromatic nucleus, an amide group, and an ester or amide linkage connecting these two groups. Those agents connected by an ester (e.g., procaine, benzocaine) are referred to as ***ester-linked LAs***, and those linked by an amide (e.g., lidocaine, mepivacaine, prilocaine, bupivacaine, and articaine) are called ***amide-linked LAs***. The aromatic group influences the hydrophobicity of the drug; the ester or amide linkage influences the duration of action and side effects of the drug; and the amino group influences the rate of onset of action and potency of the drug.

Pharmacodynamic Considerations

Resting nerve fibers are electropositive on the outside and electronegative on the inside. In response to noxious stimuli, a transient reversal of this polarity (depolarization) results from an increase in neuronal permeability to sodium ions (Figure 3-1). Thereafter, the process of repolarization begins and continues until the resting neuronal membrane potential is restored behind the traveling impulse by the efflux of potassium ions.

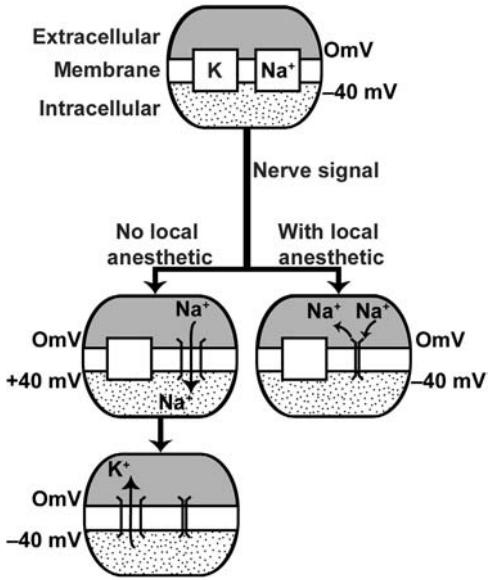

Figure 3-1. Depolarization results from an increase in the permeability of an area of the fiber membrane to sodium ions.

LAs prevent impulse transmission by blocking sodium channels in neuronal membranes. The pKa (the pH at which a drug is 50% ionized and 50% un-ionized) of LAs is between 7.6 and 8.9. Only a small percentage of an LA will be in the un-ionized (free base) form at a tissue pH of 7.4; yet, it is the free base that crosses biological barriers, including the neuronal membrane, reestablishing equilibrium between the basic and cationic forms. The ionized form of LA binds sodium channels from the inside surface of the neuronal membrane and decreases or prevents a large transient increase in permeability to sodium ions.

Pharmacokinetic Considerations

Absorption

Following administration (topical or injection), while LAs diffuse to their site of action, they are also taken up by local tissues and are removed from the site of administration by the systemic circulation. The amount of LA absorbed into the systemic circulation and the potency of the LA determine the systemic toxicity of the agent. The rate of systemic absorption of LAs is a

function of their inherent chemical characteristics (i.e., lipid solubility and pKa), vascularity at the site of administration, and the presence or absence of a vasoconstrictor in the formulation.

Distribution

Once in the systemic circulation, LAs bind reversibly to albumin and alpha-1 acid glycoprotein. The volume of distribution (V_d) for less hydrophobic LA (e.g., procaine) is small. A more hydrophobic LA (e.g., bupivacaine) will have a greater V_d and greater tissue binding (particularly the heart, lungs, liver, kidneys, brain, and cross the placenta).

Metabolism and excretion

The metabolism of ester-linked LAs takes place in the vascular compartment by plasma cholinesterases; this process is fast (minutes) and the resulting products are eliminated in the kidney. Amide-linked LAs are metabolized mainly in the liver by the CYP450 enzyme system. The metabolites are returned to the circulation and eliminated by the kidney. Metabolism is slowed in patients with cirrhosis or other liver diseases. Prilocaine and articaine may also be metabolized by plasma cholinesterases and some metabolism of amide-linked LAs can also occur in lung and kidney.

Pharmacotherapeutic Considerations

The vehicle for LAs is sterile water. Sodium chloride is added to produce isotonicity; hydrogen chloride is used to adjust the pH. Because LAs are weak bases, they form water-soluble salts with hydrochloric acid. These solutions are stable at a pH of 4.5 to 6.0. At this pH, LAs are primarily in their ionized forms. Once an agent is injected, the buffering capacity and pH of the extracellular fluid (pH 7.4) favor free-base formation, allowing for greater tissue penetration.

Vasoconstrictors (e.g., epinephrine, levonordefrin) are included in some LA formulations to slow the rate of absorption of the local anesthetic agent from the site of administration into the systemic circulation, thus increasing the duration of anesthetic action. Metabisulfite, which is an antioxidizing agent, is included in these formulations to minimize the oxidation of vasoconstrictors.

Currently available LAs (Table 3-1) may conveniently be divided into three categories based on their relative duration of anesthetic action. Procaine has a relatively short duration of action. Lidocaine, mepivacaine, prilocaine, and articaine are agents of intermediate duration. Bupivacaine will produce anesthesia of long duration. The choice of the agent and the technique used for its administration are important determinants of activity.

Topical anesthesia

Mucous membranes may be anesthetized by the topical (direct) application of aqueous or viscous formulations of benzocaine or lidocaine. Benzocaine 20% is an effective topical anesthetic agent when used before the injection of LAs. It has a relatively rapid onset and short duration of action and its systemic absorption through mucous membranes is limited. Lidocaine is available in 2% viscous, 5% ointment and liquid, and 10% spray formulations. Toxicity related to these agents has largely been attributed to the use of large doses with excessive systemic absorption. The ability of topical LAs to interfere with the pharyngeal phase of swallowing and thus cause aspiration has been documented.

Infiltration and nerve block anesthesia

Infiltration anesthesia comprises the injection of an LA solution directly into or adjacent to the area to be treated. In dentistry, there are several modified

Table 3-1. Formulations and Other Characteristics of Selected Local Anesthetic Agents

Drugs and Formulations	pKa	% Free Base at pH 7.4	FDA Risk Status	mg/mL	Toxic Dose mg/kg (maximum recommended dose)
Procaine (Novocain)					
2% plain (medical formulation)	8.9	3	C	20	6.0 (300)
Lidocaine (Xylocaine, others)					
2% plain	7.9	24	B	20	4.5 (300)
2% with epinephrine 1:50,000	7.9	24	B	20	7.0 (200)
2% with epinephrine 1:100,000	7.9	24	B	20	7.0 (500)
2% with epinephrine 1:200,000	7.9	24	B	20	7.0 (500)
Mepivacaine (Carbocaine, others)					
3% plain	7.6	39	C	30	6.6 (400)
2% with levonordefrin 1:20,000	7.6	39	C	20	6.6 (550)
Articaine (Septocaine)					
4% with epinephrine 1:100,000	7.8	25	C	40	7.0 (500)
Prilocaine (Citanest)					
4% plain	7.9	24	B	40	8.0 (600)
4% with epinephrine 1:200,000	7.9	24	B	40	8.0 (600)
Bupivacaine (Marcaine)					
0.5% with epinephrine 1:200,000	8.1	17	C	5	2.0 (90)

techniques to conventional infiltration anesthesia (e.g., intrapulpal, intraligamental). Nerve block anesthesia is associated with the injection of an LA around peripheral nerve trunks or nerve plexuses. This technique provides anesthesia to a greater anatomical area.

Primary line drugs

Lidocaine hydrochloride. Lidocaine (Xylocaine, others), 2%, is the most commonly used LA. It is an amine-linked drug of moderate hydrophobicity, rapid onset of action, medium duration of action, and moderate potency. Formulations with epinephrine have a longer duration of action. Toxic effects are manifested mainly as CNS depression (drowsiness, tinnitus, twitching, and seizures) and decreased myocardial contractility.

Mepivacaine hydrochloride. Mepivacaine (Carbocaine, others), 3% or 2%, has an onset and duration of action, potency, and toxicity similar to lidocaine. Mepivacaine may be used for short procedures in a 3% concentration without a vasoconstrictor. Mepivacaine, 2% with levonordefrin, 1:20,000, is less likely to cause beta$_1$-adrenergic receptor activation and cardiac stimulation than epinephrine.

Prilocaine hydrochloride. Prilocaine (Citanest), 4%, has vasoconstrictive activity and will produce satisfactory anesthesia without a vasoconstrictor or with epinephrine 1:200,000. Common adverse drug effects are similar to those of lidocaine. However, prilocaine has been associated with a statistically significant increase in the incidence of paresthesia when compared with lidocaine or mepivacaine and may produce methemoglobinemia in susceptible patients.

Articaine hydrochloride. Articaine (Septocaine), 4%, with epinephrine 1:100,000 is the newest amide-linked local anesthetic agent. It is unusual in that it has a thiophene nucleus. It also contains an ester group, which means that it can be partially metabolized by plasma cholinesterases. Articaine's rapid metabolism in plasma may minimize its potential systemic toxicity. Common adverse drug effects are similar to those of lidocaine, but articaine, like prilocaine, is more likely to cause a statistically significant increase in the incidence of paresthesia when compared with lidocaine or mepivacaine and may produce methemoglobinemia in susceptible patients.

Secondary line drug

Bupivacaine hydrochloride. Bupivacaine (Marcaine), 0.5% with epinephrine 1:200,000, is a long-acting local anesthetic agent. It is a highly hydrophobic, high-potency agent with long duration of action and should be used with caution in the young and the old. Common adverse drug effects are similar to those of lidocaine; however, its cardiotoxicity at higher concentrations limits its use.

Tertiary line drug

Procaine hydrochloride. Procaine (Novocain), available only as a 30-mL medical formulation (2% without epinephrine), is a short-acting (low hydrophobicity), low-potency, ester-linked LA. It is degraded rapidly by plasma cholinesterases and excreted by the kidney. One of the metabolites of procaine is para-aminobenzoic acid (PABA), a highly allergenic compound. Procaine is the LA of choice for that rare patient with true hypersensitivity to amide-linked agents.

Adverse Drug Events

Accurate statistics on the frequency of untoward reactions to LAs (i.e., morbidity and mortality) are not readily available because few such cases have been reported. Estimates range from 1 death in 1.4 million local anesthetic administrations to 1 in 45 million. Despite an apparent excellent record of safety

Table 3-2. Clinical Manifestations of Local Toxic Effects

Epithelial Tissue	Nerve Tissue
• Tissue edema	• Anesthesia
• Desquamation	• Causalgia
• Necrosis	• Neuritis
• Decreased wound healing	• Paresthesia

with LAs, clinicians must not compromise precautionary measures (e.g., attention to medical history, aspiration, and the use of minimal dose).

Local toxic reactions

Local toxicity primarily manifests as epithelial, vascular, or neural damage when the recommended dose of an LA is exceeded (Table 3-2). Most of these adverse drug effects are transient, but prolonged anesthesia or paresthesia of the lip or tongue may take 2 to 6 months to resolve. In rare instances, the neurological deficit may become permanent. (Refer to Chapter 2: *Adverse Drug Events*.)

Systemic toxic reactions

Systemic toxic reactions are usually associated with inadvertent intravascular injection, injection into a highly vascular area, altered detoxification, overdose, and injecting without a vasoconstrictor. The signs and symptoms of systemic toxicity predominate in the central nervous, respiratory, and cardiovascular systems, and they account for the majority of the adverse reactions to LAs (Table 3-3). A practical approach to determine the dosage of LAs is based on the patient's weight (Table 3-1).

Methemoglobinemia. Methemoglobinemia is a relatively uncommon toxic reaction to prilocaine, articaine, or benzocaine in susceptible patients. Metabolites of these drugs bind hemoglobin molecules and interfere with their oxygen-carrying capacity. Cyanosis in the absence of cardiopulmonary symptoms, nausea, sedation, seizures, and coma has been reported in severe overdose.

Sympathetic reactions

LA formulations may contain 1:100,000 (0.01 mg/mL) epinephrine, 1:200,000 (0.005 mg/mL) epinephrine; 1:50,000 (0.02 mg/mL) epinephrine, or 1:20,000 (0.05 mg/mL) levonordefrin, which physiologically is equivalent to 1:100,000 epinephrine. Healthy adults can safely receive up to 0.2 mg of epinephrine and 1.0 mg of levonordefrin per visit.

Table 3-3. Clinical Manifestations of Systemic Toxic Effects

• Lightheadedness	• Lethargy
• Tremors	• Coma
• Disorientation	• Dyspnea
• Altered mood	• Respiratory depression
• Slurred speech	• Bradycardia
• Visual and auditory disturbances	• Hypotension
• Clonic seizures	• Cardiac arrest
• Sedation	

Table 3-4. Clinical Manifestations of Sympathetic Toxic Reactions

Mild Reactions	Severe Reactions
• Restlessness	• Palpitation
• Headache	• Tachycardia
• Tremors	• Chest pain
• Dizziness	• Ventricular fibrillation
• Pallor	• Cardiac arrest

The inadvertent intravascular injection of an LA containing a vasoconstrictor, the use of an LA containing a high concentration of a vasoconstrictor, the potentiation of the injected vasoconstrictor by endogenous catecholamines, and concomitant therapy with other sympathomimetic agents may contribute to adverse sympathetic effects (Table 3-4).

Vasoconstrictors must be avoided in patients under the influence of cocaine. There are also a number of clinical situations where the judicious use of vasoconstrictors is imperative. These include treating patients with blood pressure in excess of 180/110, patients with severe cardiovascular disease (i.e., recent myocardial infarction [more than 7 days but less than 1 month], unstable angina pectoris, decompensated heart failure, severe valvular disease, symptomatic ventricular arrhythmias, supraventricular arrhythmias with uncontrolled ventricular rate, and high-grade AV block), and patients with uncontrolled hyperthyroidism.

Exercise capacity is a simple and reliable index to estimate cardiac function in patients with heart disease. It has been shown that the hemodynamic effects of infiltration anesthesia (72 mg of lidocaine and 0.045 mg of epinephrine) were less than those produced by ergometric stress testing at 25 watts in young patients and at 15 watts in older subjects. The workload of ergometric stress testing at these levels is about four metabolic equivalents (METs).

Four METs are approximately the same as the workload produced by climbing a flight of stairs, walking 4.8 km/hour, doing light yard work (raking leaves, weeding, or pushing a power mover), painting, or doing light carpentry work. Based on this evidence, 0.045 mg of epinephrine can be administered safely to patients who can tolerate the activities noted above with minimal or no symptoms such as shortness of breath, chest pain, or fatigue. Based on U.S. formulations of LAs, 0.045 mg of epinephrine is equivalent to the amount in 4.5 mL of any LA with epinephrine 1:100,000.

It has also been documented that oral surgical procedures (e.g., tooth extraction, alveoplasty, soft tissue biopsy) under LA (lidocaine 2% with epinephrine 1:100,000 or bupivacaine 0.5% with epinephrine 1:200,000) did not affect cardiac rhythm in patients with cardiovascular diseases (i.e., hypertension, coronary artery disease [e.g., angina pectoris, previous myocardial infarction], conduction abnormalities, and heart failure). The epinephrine dose administered ranged from 0.010 to 0.079 mg, or the equivalent of 1.0 to 7.9 mL of any LA with epinephrine 1:100,000.

Allergic reactions

In the past, allergic reactions to LAs were accurately attributed to procaine. The antigenicity of procaine and other ester compounds lies in their structural

formula. The breakdown of the ester-linked LAs proceeds via hydrolysis, which is catalyzed by plasma cholinesterase. One of the breakdown products, PABA, a highly antigenic compound, is capable of eliciting the formation of antibodies or sensitized lymphocytes.

True allergy to amide-linked LAs is rare. In the past, many amide-linked LAs contained methylparaben, a germicide with bacteriostatic and fungistatic properties. Methylparaben, an alkyl ester of PABA, is structurally similar to PABA, suggesting the mechanism for hypersensitivity. Sulfites, widely used as antioxidants in food, are also found in local anesthetic solutions containing a vasoconstrictor. Angioedema and urticaria have been reported following the administration of LAs containing antioxidants (metabisulfite), but there appears to be no cross-allergenicity with sulfonamide antibacterial agents. (Refer to Chapter 2: *Adverse Drug Events* and Chapter 7: *Management of Medical Emergencies in the Oral Health Care Setting*.)

Psychomotor reactions

Psychomotor reactions are likely to occur in the oral health care setting in response to emotional stress brought on by pain, surgical manipulation, the sight of blood, or heat. Psychomotor reactions are seen most commonly in young adults.

Vasopressor syncope. Patients with vasopressor syncope experience cerebral ischemia as a result of dilation of resistance vessels secondary to a generalized, progressive autonomic discharge with an initial adrenergic and a compensatory cholinergic component (Table 3-5). The adrenergic component produces pallor, tachycardia, hyperventilation, clonic activity, and pupillary dilation. The cholinergic component is characterized by perspiration, nausea, salivation, hypotension, bradycardia, and syncope. (Refer to Chapter 7: *Management of Medical Emergencies in the Oral Health Care Setting*.)

Hyperventilation. Hyperventilation is a state of decreased systemic carbon dioxide concentration. Affected patients usually have a history of dyspnea often precipitated by anxiety, but it may also be from hypoxia associated with cardiopulmonary disease. Signs and symptoms include paresthesia (burning or prickling feeling) of the extremities and face accompanied by chest tightness, dizziness, and a dry mouth. Occasionally, cerebral vasoconstriction may lead to syncope. Tonic muscle spasms are diagnostic. (Refer to Chapter 7: *Management of Medical Emergencies in the Oral Health Care Setting*.)

Local anesthetic agents, epinephrine, and pregnancy

There is no evidence that any LA is teratogenic in humans; however, drugs in general should be administered with caution for pregnant women. To assist

Table 3-5. Clinical Manifestations of Vasopressor Reactions

Adrenergic Component	Cholinergic Component
• Pallor	• Perspiration
• Tachycardia	• Salivation
• Hyperventilation	• Nausea
• Papillary dilatation	• Bradycardia
• Clonic activity	• Hypotension
	• Syncope

practitioners, the U.S. Food and Drug Administration (FDA) has established a code for categorizing drugs according to their potential to cause fetal injury (Table 3-1). (Refer to Chapter 1: *General Principles of Pharmacology* and Chapter 2: *Adverse Drug Events*.) Lidocaine 2% with epinephrine 1:100,000 (FDA Pregnancy Category rating of B) is the LA of choice in the treatment of pregnant women. While vasoconstrictors can adversely affect uterine blood flow and prolong labor, studies have not documented adverse fetal effects with dosages less than 0.01 mg of epinephrine.

ANALGESICS

Three types of analgesics are available for the management of acute odontogenic pain: cyclooxygenase (COX) inhibitors (Table 3-6), opioid analgesics (Table 3-7), and adjuvant drugs. An adjuvant may either enhance the efficacy of an analgesic or it may have an analgesic activity of its own. Caffeine in doses of 65 to 200 mg enhances the analgesic effect of acetylsalicylic acid (ASA), acetaminophen (APAP), and ibuprofen in dental and other acute pain syndromes. Hydroxyzine (an antihistamine) in doses of 25 to 50 mg enhances the analgesic effect of opioids in postoperative pain, and significantly reduces the incidence of opioid-induced nausea and vomiting. Corticosteroids, through their anti-inflammatory and phospholipase-inhibitory effects, can produce analgesia in some patients with pain of inflammatory origin.

Pharmacodynamic Considerations

Cyclooxygenase inhibitors

Prostaglandins are ubiquitous endogenous substances known to modulate inflammation, affect vascular tone and permeability, and influence pain perception. At least three cyclooxygenase isoenzymes are known to catalyze the rate-

Table 3-6. Selected Cyclooxygenase Inhibitors

Drugs	Usual Oral Dose	Maximum Daily Dose	Pregnancy Risk Category*
Acetylsalicylic acid (Aspirin [OTC], Anacin [OTC], others)	500–1,000 mg	4,000 mg	D
Acetaminophen (Tylenol [OTC], others)	500–1,000 mg	4,000 mg	B
Ibuprofen (Advil [OTC], Nuprin [OTC], Motrin, others)	200–800 mg	2,400 mg	B D (Third trimester)
Naproxen (Naprosyn)	500-mg loading dose then 250 mg	1,250 mg	B C (Third trimester)
Naproxen sodium (Aleve [OTC], Anaprox, others)	550-mg loading dose then 275 mg	1,375 mg	B C (Third trimester)

*Refer to Chapter 1: *General Principles of Pharmacology*.
OTC, over the counter.

Table 3-7. Selected Opioid-Receptor Agonists

Drug	Formulations	Pregnancy Risk Category*	Restrictions*
Codeine	With ASA, 30/325 mg (Empirin with codeine) With APAP, 30/325 mg (Tylenol with codeine)	C D (If used for a prolonged period or in high doses at term)	C-III
Hydrocodone	With ASA, 5/500 mg (Lortab ASA) With ibuprofen, 7.5/200 mg (Vicoprofen) With APAP, 5/500 mg (Vicodin)	C	C-II
Tramadol	50 mg (Ultram) With APAP 37.5/325 mg (Ultracet)	C	Rx
Oxycodone	With ASA, 5/325 mg (Percodan) With APAP, 5/500 mg (Percocet) With ibuprofen, 5/400 mg (Combunox)	C	C-II

*Refer to Chapter 1: *General Principles of Pharmacology*.
APAP, acetaminophen; ASA, acetylsalicylic acid.

limiting step of prostaglandin synthesis: COX-1 (acetylsalicylic acid [ASA] and other nonsteroidal anti-inflammatory agents [NSAIDs]), COX-2 (celecoxib), and COX-1 variant (acetaminophen [APAP]). COX-1 is expressed in most tissues, including platelets, and it is also thought to protect the gastric mucosa. COX-2 is expressed primarily in the brain and kidneys and can be induced in other tissues (especially in association with inflammation), but it is not found in abundance in platelets. COX-1 variant is expressed primarily in the CNS. To varying degrees, ASA and other NSAIDs block all three COX isomers. In therapeutic doses, celecoxib selectively inhibits COX-2. APAP, a relatively weak inhibitor of peripheral prostaglandin biosynthesis, is highly effective in inhibiting COX-1 variant in the CNS. COX inhibitors alter sensitivity (i.e., increase the pain threshold) to noxious stimuli, but they all reach a ceiling dose for their maximum analgesic effect.

Opioid-receptor agonists

Opioid-receptor agonists produce analgesia by interacting with opioid receptors, which are also the natural binding sites for a number of endogenous peptides (beta-endorphins, endomorphins, enkephalins, and dynorphins). Opioid receptors are found in the peripheral nervous systems and CNS and their natural ligands appear to inhibit calcium influx into neurons and the release of substance P from neuron terminals. The affinity of a particular opioid-receptor

Table 3-8. Opioid Receptors

Receptors	Primary Endogenous Ligands	Effects
mu (MOP[1] or OP_3)	Endorphins and endomorphins	• Analgesia • Euphoria • Decreased respiration
delta (DOP[1] or OP_1)	Enkephalins	• Analgesia • Decreased respiration
kappa (KOP[1] or OP_2)	Dynorphins	• Analgesia • Dysphoria • No respiratory effect
Opioid-receptor-like (ORL[1] or OP_4)	Orphanin FQ or nociceptin	• Analgesia • No respiratory effect

agonist to a specific receptor subtype explains the therapeutic and adverse effects of opioid-receptor agonists (Table 3-8). Most pain can be relieved with opioid analgesics if the drugs are given in adequate dosages. Stronger opioid agonists, such as morphine, have no clinically relevant ceiling effect to analgesia. As the dosage is raised, analgesic effect increases in a log-linear function until either analgesia is achieved or somnolence occurs.

Pharmacokinetic Considerations

Cyclooxygenase inhibitors

COX inhibitors are rapidly absorbed from the stomach and the upper small intestine. They reach appreciable plasma concentrations in 30 to 60 minutes and peak values at about 2 to 3 hours. The rate of absorption is determined by the formulation and pKa of the drug, the pH at the mucosal surface, vascularity of the absorptive surface, and gastric emptying time. Because absorption occurs primarily by passive diffusion of lipid-soluble molecules across the gastrointestinal mucosal membranes, the rate of absorption is decreased in an alkaline environment. After absorption, COX inhibitors are distributed throughout most body tissues and fluids, and cross the placenta. They are metabolized in many tissues but particularly in liver endoplasmic reticulum and mitochondria. The metabolism of therapeutic doses normally follows first-order kinetics; however, after larger doses, the enzymes that metabolize these drugs become saturated, which leads to increased half-lives. Metabolites are excreted primarily by the kidneys as water-soluble conjugates.

Opioid-receptor agonists

Opioid-receptor agonists are readily absorbed from the gastrointestinal tract but not all are suitable for oral administration because of significant first-pass metabolism in the liver. All opioids are to some degree protein bound in plasma. The free forms readily leave the blood and accumulate in organs with high parenchyma (i.e., kidney, liver, lung, and spleen) and cross the blood-brain barrier. During pregnancy, placental transfer occurs. The decline in opioid plasma levels parallels the decline in opioid analgesia and is coincident with

the appearance of metabolites in the liver. The major pathway for detoxification of opioids is conjugation with glucuronic acid. The major route of elimination of opioids and their metabolites is by glomerular filtration.

Pharmacotherapeutic Considerations

The optimal dose of an analgesic that will provide adequate pain relief must be established by titration and the drug should be administered on schedule. "By-the-clock" administration of analgesics is much more effective than waiting for pain to return before giving the next dose and may actually reduce the total dosage required for the management of a painful episode. Some patients may respond better to one COX inhibitor or COX-inhibitor/opioid combination than to another. Currently available formulations may not be optimal in the management of all pain of odontogenic origin, and clinicians may have to prescribe more than one analgesic to be administered concurrently to achieve maximal results. Prescribing two drugs (at therapeutic doses) with similar mechanisms of action has no rational pharmacological basis, but prescribing two drugs (at therapeutic doses) with different mechanisms of action is good medicine. Table 3-9 represents sample prescriptions for the treatment of acute odontogenic pain.

Primary line drugs (mild pain)

ASA, the standard for the comparison and evaluation of orally effective analgesics, is effective in the treatment of most types of mild pain. Unlike other NSAIDs, however, a single dose of ASA irreversibly inhibits platelet function for the 8- to 10-day life of the platelet, interfering with hemostasis and prolonging the bleeding time. A single dose of ASA can also precipitate asthma in ASA-sensitive patients. High doses or chronic use of ASA can cause gastropathy.

APAP, 650 mg, is as effective as ASA 650 mg, with similar potency and time-effect curve. Maximum analgesic effect usually occurs with single doses between 650 and 1300 mg; however, it does not have the antiplatelet and adverse gastrointestinal effects, and the frequent renal and possible cardiovascular toxicity associated with NSAIDs. Most healthy patients can take up to 4 g daily with no adverse effects.

APAP, 650 mg, is less effective than 200 mg of ibuprofen; however, 200 mg of ibuprofen in combination with 650 mg of APAP is more effective than 200 mg of ibuprofen or 650 mg of APAP alone. Ibuprofen, 400 mg, is superior to 200 mg of ibuprofen with longer duration. Naproxen sodium, 440 mg, is comparable to 400 mg of ibuprofen with longer duration.

Since ASA's principal use today is in low doses as a platelet inhibitor and APAP has no clinically useful anti-inflammatory activity, over-the-counter (OTC) formulations of ibuprofen, 200 mg (Advil, Nuprin, others), or naproxen sodium, 220 mg (Aleve, others), are the drugs of choice for the management of mild odontogenic pain.

Secondary line drugs (moderate pain)

In single full doses, most NSAIDs are more effective analgesics than full doses of ASA and APAP for moderate pain and some have shown equal or greater analgesic effect than usual doses of an oral opioid combined with ASA or APAP. The adverse effects of NSAIDs are qualitatively similar to those of ASA. They can precipitate asthma and anaphylaxis in ASA-sensitive patients. Unlike ASA, however, NSAIDs cause reversible inhibition of platelet aggrega-

Table 3-9. Sample Prescriptions (3-Day Regimen) for the Treatment of Acute Odontogenic Pain

Primary Line of Treatment

OTC
ASA, 500-mg tabs, 2 tabs QID, max. daily dose 4,000 mg
Ibuprofen (Advil), 200-mg tabs, take 2 tabs QID, max. daily dose 2,400 mg
Naproxen (Aleve), 200-mg tabs, take 2 tabs QID, max. daily dose 1,375 mg
APAP, 500-mg tabs, take 2 tabs QID, max. daily dose 4,000 mg

Secondary Line of Treatment

Rx
Ibuprofen, 800-mg tabs
Disp. 10 tabs
Sig. Take 1 tab TID until all tabs are taken

Naproxen sodium, 275-mg tabs
Disp. 10 tabs
Sig. Take 2 tabs stat then 1 tab TID until all are taken

Hydrocodone with ibuprofen, 7.5-mg/200-mg tabs
Disp. 24 tabs
Sig. Take 2 tabs QID until all are taken

Hydrocodone with APAP, 5-mg/500-mg tabs
Disp. 24 tabs
Sig. Take 2 tabs QID until all are taken

Tramadol with APAP, 37.5-mg/325-mg tabs
Disp. 24 tabs
Sig. Take 2 tabs QID until all are taken

Tertiary Line of Treatment

Rx
Oxycodone with ibuprofen, 5-mg/400-mg tabs
Disp. 24 tabs
Sig. Take 2 tabs QID until all are taken

Oxycodone with APAP, 7.5-mg/500-mg tabs
Disp. 24 tabs
Sig. Take 2 tabs QID until all are taken

APAP, acetaminophen; ASA, acetylsalicylic acid; OTC, over the counter.

tion; platelet function returns to normal when most of the drug has been eliminated.

Ibuprofen, 400 mg, has been shown to be more effective than 60 mg of codeine, more effective than 650 mg of ASA with 60 mg of codeine, and more effective than 600 mg of APAP with 60 mg of codeine. Hydrocodone, 15 mg, with 400 mg of ibuprofen has been shown to be superior to 400 mg of ibuprofen alone; but it has also been shown that 800 mg of ibuprofen has a longer duration of action than 400 mg of ibuprofen and has a dose-dependent increase

in its analgesic and anti-inflammatory efficacy. Consequently, 800 mg of ibuprofen is the drug of choice for the management of moderate odontogenic pain.

Tramadol. Tramadol is a nonopioid opioid-receptor agonist, which also blocks the reuptake of norepinephrine and serotonin. It appears to have fewer associated adverse effects than opioid analgesics. In the management of odontogenic pain, 50 mg of tramadol is equianalgesic to 60 mg of codeine. In patients with dental pain, two orally administered fixed combination tablets of tramadol/APAP, 37.5/235 mg, are more effective than one tablet and as effective as hydrocodone/APAP, 10/650 mg. Tramadol in combination with APAP may be an appropriate alternative for the management of odontogenic pain in those situations where NSAIDs or opioid analgesics are contraindicated.

Tertiary line drugs (severe pain)

Oxycodone, 5 mg, with 400 mg of ibuprofen has been shown to be superior to oxycodone, 5 mg, with 325 mg of APAP, which was still superior to hydrocodone 7.5 mg with 500 mg of APAP. Clearly, oxycodone in combination with ibuprofen is the drug of choice for the management of severe odontogenic pain.

Adverse Drug Events

Cyclooxygenase inhibitors

Intolerance. Uncommonly, COX inhibitors can cause IgE-dependent hypersensitivity reactions leading to vasomotor collapse. Intolerance to NSAIDs is most likely to occur in patients with a history of asthma, nasal polyps, and chronic urticaria. A single dose of these agents can precipitate asthma in susceptible patients, probably related to COX-1 inhibition, which results in increased levels of leukotrienes. A history of rhinorrhea, urticaria, angioedema, or bronchospasm occurring within 3 hours after exposure is an acceptable method of determining intolerance. APAP is usually well tolerated in recommended therapeutic dosages. However, an erythematous or urticarial rash may occur occasionally, accompanied at times by fever and mucosal lesions. The mechanism of intolerance to APAP is unknown.

Gastropathy. Therapeutic doses of NSAIDs may cause epigastric distress, nausea, and vomiting. They can also exacerbate the symptoms of peptic ulcer disease and, with long-term use, bleeding, ulceration, and perforation can occur. Gastric bleeding induced by NSAIDs is painless and may lead to iron-deficiency anemia. COX-2 inhibitors have been associated with abdominal pain, diarrhea, and dyspepsia.

Antithrombotic effects. NSAIDs impair platelet adhesion to tissue components and platelet aggregation primarily through the inhibition of thromboxane A_2 synthesis. ASA irreversibly inhibits platelet function for the lifetime of the platelet, or about 8 to 10 days. In contrast to ASA, platelet inhibition is reversible and short-lived with therapeutic doses of other NSAIDs. Platelet function returns to normal when most of the drug has been eliminated from the body. However, in the presence of bleeding diatheses (hereditary, acquired, or drug induced), the antiplatelet effect of these agents may also contribute to serious bleeding. APAP appears to be a suitable substitute in patients with peptic ulcer disease, hemophilia, or other bleeding disorders, and those taking anticoagulants.

Pregnancy-related events. There is no evidence that therapeutic doses of NSAIDs cause fetal abnormalities other than reduced birth weight with ASA.

However, an increased incidence of postpartum bleeding has been observed in patients taking NSAIDs. In pregnant patients, APAP is a suitable substitute for NSAIDs in the management of pain.

Hepatic toxicity. Adverse hepatic reactions have been reported in association with most NSAIDs. They appear to be idiosyncratic and often dose-related. Predisposing factors for toxic reactions include advanced age, decreased renal function, and collagen vascular diseases. Lower dosages of these drugs should be used when factors predisposing to liver toxicity are present; monitoring liver function test results in patients with a history of long-term use is reasonable.

APAP is metabolized primarily by hepatic conjugation. In high doses, APAP is converted by the CYP2E1 isoenzyme into a hepatotoxic metabolite. (Refer to Chapter 2: *Adverse Drug Events*.) Ethanol abuse and malnutrition may enhance such toxicity even at therapeutic doses. Nausea, vomiting, anorexia, diarrhea, and abdominal pain occur during the first 24 hours. Clinical evidence of hepatic damage may be noted in 2 to 6 days. When the drug's half-life exceeds 12 hours, hepatic coma and death are likely.

Renal toxicity. COX inhibitors decrease the synthesis of renal prostaglandins, decrease renal blood flow, cause fluid retention, and may precipitate renal failure in susceptible patients. Risk factors include old age, chronic renal insufficiency, congestive heart failure, cirrhosis, and concurrent diuretic use.

Opioid-receptor agonists

Gastropathy. Nausea, vomiting, and constipation are the most common adverse effects of opioid analgesics. Nausea and vomiting are direct results of stimulation of the chemoreceptor trigger zone in the medulla. Depression of the vomiting center occurs late in the course of intoxification. Opioid-induced constipation is a result of decreased mobility associated with an increase in the tone of the anterior portion of the stomach.

Intolerance. Allergic reactions to opioid analgesics are rare. However, some opioids are able to induce histamine release from mast cells and cause peripheral vasodilatation and orthostatic hypotension (pseudoallergic reaction). The cutaneous blood vessels tend to dilate around the "blush areas" (e.g., face, neck, upper thorax). (Refer to Chapter 2: *Adverse Drug Events*.)

Cardiovascular effects. Opioids promote the release of histamine. In the supine patient, this may lead to orthostatic hypotension. In patients with coronary artery disease, morphine decreases oxygen consumption, making it the preferred analgesic in patients with ischemic heart disease.

Respiratory effects. Opioids depress respiratory chemoreceptor sensitivity to carbon dioxide. Concurrent administration of oxygen may cause apnea. Carbon dioxide retention produces intracranial vasodilatation and may aggravate increased intracranial pressure. Opioids should be used with great caution in cases of head injury, the elderly, those otherwise debilitated, and patients with pulmonary disease, particularly severe asthma, because of cough reflex suppression, impairment of ciliary activity, and aggravation of bronchospasm.

Effects on the central nervous system. Opioids modulate mood and behavior, causing drowsiness and euphoria in some, anxiety and dysphoria in others. They produce miosis as a result of an excitatory action on the autonomic segment of the nucleus of the oculomotor nerve. The miosis is marked and pinpoint pupils are pathognomonic of opioid use/abuse.

Effects on pregnant women and nursing infants. The use of opioids in the pregnant or nursing patient is discouraged because of their general CNS

depressant effects on the fetus and infant. However, short-term use of therapeutic doses of codeine in combination with APAP is appropriate for the management of moderate-to-severe odontogenic pain.

Effects on geriatric patients. A paradoxical sensitivity to opioids in the elderly is not uncommon. Frequently, the dosages must be reduced by as much as one-half to one-fourth of the usual therapeutic dosage to avoid both toxic and paradoxical effects.

Tolerance. Tolerance is influenced by dose, frequency (long-term use), and the specific opioid administered. Cross-tolerance among opioids has been observed. Tolerance develops to most of the adverse effects of opioids, including respiratory and CNS depression, at least as rapidly as tolerance to the analgesic effect. However, no tolerance develops to their gastrointestinal (constipation) and papillary (miosis) actions.

Dependence. Patients who take opioids for acute pain rarely experience euphoria and even more rarely develop psychological dependence or addiction to their mood-altering effects. Clinically significant dependence develops only after several weeks of treatment with relatively large doses. Withdrawal symptoms include dilated pupils, rapid pulse, goose flesh, muscle jerks, a flulike syndrome, vomiting, diarrhea, tremors, yawning, and then sleep.

Overdose. Constricted pupils (miosis), depressed to absent respiration with cyanosis (depressed respiratory chemoreceptor sensitivity to carbon dioxide), hypotension (sometimes shock), hypothermia, sedation, stupor, coma, and convulsions characterize overdose. The respiratory depressant effects of various opioid analgesics are comparable with equianalgesic doses. Naloxone, a narcotic antagonist, will reverse apnea and coma that results from opioid toxicity. Seizures can be treated with diazepam.

MEDICAL MANAGEMENT OF NEUROPATHIC PAIN

Unlike patients with nociceptive pain, patients with neuropathic pain generally do not respond to conventional analgesic therapy. The treatment of neuropathic pain disorders with psychotropic pharmacotherapeutic agents is an evolving area of therapy. Tricyclic antidepressants, such as amitriptyline and imipramine, and anticonvulsants, such as carbamazepine, clonazepam, valproic acid, gabapentin, lamotrigine, topiramate, and phenytoin, are effective in the management of many neuropathic pain syndromes. The use of these medications requires meticulous titration and laboratory screening before and during therapy.

CONCLUSION

In practice, the efficacy of any particular local anesthetic agent or analgesic in a specific patient will be determined by the degree of anesthesia or analgesia produced following dosage escalation through a range limited by the development of adverse effects. Clinicians should prescribe medication at high enough dosage, soon enough, often enough, and long enough; they should prescribe as they would wish to receive.

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INTRODUCTION

The routine use of antibacterial agents for the management of odontogenic infections has not been shown to be effective. Most of these infections can be resolved satisfactorily through an approach that incorporates debridement (primary dental care) to reduce the microbial load. Odontogenic infections are polymicrobial. Facultative organisms, particularly viridans streptococci, accompanied by strict anaerobes, appear to predominate in all types of odontogenic infections. When antibacterial chemotherapy is indicated, the drug of choice should be either the most effective drug against the infective pathogens or the least toxic alternative among several effective agents. It should also be emphasized that drugs seldom exert their beneficial effects without also causing adverse effects. Dealing with this certainty, the clinician familiar with the mechanisms of action, principles of disposition, and therapeutic and adverse effects of antibacterial agents has the advantage.

ETIOLOGY AND EPIDEMIOLOGY

The human body harbors a dense, diverse, indigenous flora that includes bacteria, viruses, fungi, and protozoa. Interaction between these various microbial ecosystems determines the normal flora. Microorganisms of the normal flora establish symbiotic relationships (mutualism, commensalism, or parasitism) with their human host and each other. Factors that modify or shift this balanced environment (age, altered anatomy, diet, local and systemic conditions, pharmacotherapy) may predispose a patient to infection. ***Infection*** may be defined as the invasion and multiplication of microorganisms in body tissues resulting in local cellular injury. An infection may be ***autogenous***, caused by the body's normal flora, which has become pathogenic; or it may be a ***cross-infection***, commonly related to the proliferation of transient microorganisms obtained from other humans, animals, or the environment.

The oral environment harbors more than 300 bacterial species and as many as 664 strains of bacteria have been isolated from test cases. These include both Gram-positive and Gram-negative organisms, which may be aerobic, anaerobic, or facultative. The number of isolated strains in most odontogenic infections ranges from 1 to 10, with an average number of approximately four isolates per infection. The most common organisms responsible for odontogenic infections are viridans streptococci (*Streptococcus oralis, S. sanguis,* and *S. mitis)*, *Actinomyces, Peptostreptococcus, Fusobacterium,* pigmented and nonpigmented *Prevotella, Gemella, Porphyromonas, Bacteroides,* and *Veillonella.*

ANTIBACTERIAL AGENTS

Pharmacodynamic Considerations

Whereas antibacterial agents differ markedly in their physical, chemical, and pharmacological properties, a classification system based on their mechanisms of action and antibacterial spectra facilitate empirical drug selection. Furthermore, antibacterial agents may be described as either bacteriostatic or bactericidal. ***Bacteriostatic drugs*** inhibit bacterial growth. This is reversible once antibacterial treatment is terminated unless therapeutic intervention (i.e., elimination of the source of infection by debridement) and host defense mechanisms have eradicated the offending pathogens. ***Bactericidal drugs*** kill bacteria and are less dependent on host defense mechanisms for the success of therapy.

The mechanisms of action of antibacterial agents that may be used for the treatment of odontogenic infections are illustrated in Figure 4-1.

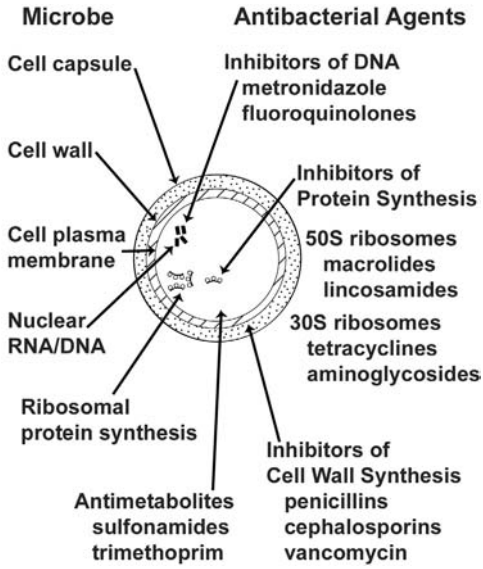

Figure 4-1. Mechanisms of action of antimicrobial agents.

Bacterial cell wall inhibitors

Bacterial cells are hyperosmolar. To prevent them from absorbing water, bacteria synthesize peptidoglycans and mucopeptides in the cytoplasm. These complex macromolecules are transferred across the plasma membrane with the help of a carrier molecule and are linked to form a peptidoglycan cell wall. Penicillins, cephalosporins, and vancomycin inhibit enzyme activity essential for the synthesis of the peptidoglycan cell wall. The beta-lactam antibiotics (penicillins and cephalosporins) also activate autolytic enzymes, which contribute to bacterial cell wall destruction. Bacterial cell wall inhibitors are bactericidal in susceptible organisms (Table 4-1).

Inhibitors of nucleic acid synthesis and integrity

Bacteria, like human cells, must synthesize nucleic acids, which are critical for self-maintenance and replication. Inhibitors of nucleic acid synthesis and integrity act in a variety of ways. Sulfonamides and trimethoprim sequentially block the folate pathway essential for the synthesis of purines and pyrimidines and inhibit both DNA and RNA synthesis. Fluoroquinolones inhibit DNA gyrase (bacterial type II topoisomerase) function, thereby releasing DNA with staggered double-stranded breaks, which leads to cell death. An activated intermediate of metronidazole interacts with bacterial DNA to cause loss of helical DNA structure and effect strand breakage. Consequently, whereas sulfonamides and trimethoprim are bacteriostatic, the fluoroquinolones and metronidazole are bactericidal (Table 4-2).

Inhibitors of transcription or translation

Bacteria, like mammalian cells, must also synthesize proteins. The first step in protein synthesis consists of copying an mRNA code from the DNA blueprint. The mRNA travels to the cytoplasm where bacterial ribosomes translate the code and synthesize proteins essential for self-maintenance and replication. The macrolides and lincosamides attach to specific receptors on 50S ribosomal subunits and reversibly inhibit the initiation of protein synthesis. Tetracyclines bind to 30S ribosomal subunits and reversibly block an essential step in protein synthesis. The aminoglycosides also bind to 30S ribosomal subunits and initiate the synthesis of abnormal polypeptides. Consequently, the macrolides, lincosamides, and tetracyclines are bacteriostatic, whereas the aminoglycosides are bactericidal (Table 4-3).

Table 4-1. Bacterial Cell Wall Inhibitors and Their Spectra

Class	Subclass	Antibacterial Spectra	Advantages/Disadvantages
Penicillins	Narrow-spectrum penicillins (penicillin G, procaine penicillin G, benzathine penicillin G, penicillin VK)	Gram-positive cocci and most Gram-negative oral anaerobes	Beta-lactamase susceptible
	Penicillinase-resistant penicillins (methicillin, oxacillin, cloxacillin, dicloxacillin, nafcillin)	Gram-positive cocci	Beta-lactamase resistant
	Broad-spectrum penicillins (ampicillin, amoxicillin, amoxicillin with clavulanic acid)	Gram-positive cocci and most Gram-negative oral anaerobes	Beta-lactamase susceptible; with clavulanic acid, mostly beta-lactamase resistant
	Antipseudomonal penicillins (carbenicillin, ticarcillin, ticarcillin with clavulanic acid, piperacillin, mezlocillin)	Gram-negative organisms	With clavulanic acid, mostly beta-lactamase resistant
Cephalosporins	1st-generation cephalosporins (cephalexin, cephradine, cefadroxil)	Gram-positive cocci and some Gram-negative oral anaerobes	Beta-lactamase susceptible
	2nd-generation cephalosporins (cefaclor)	Gram-positive cocci and extended spectrum to Gram-negative oral anaerobes	Some beta-lactamase resistance
	3rd-generation cephalosporins (cefixime)	Gram-negative bacilli	Greater beta-lactamase resistance
Vancomycin		Many Gram-positive cocci and Gram-negative bacilli	Beta-lactamase resistant

Table 4-2. Nucleic Acid Synthesis Inhibitors and Antimetabolites and Their Spectra

Class	Subclass	Antibacterial Spectra
Antimetabolites	Sulfonamides and trimethoprim	Gram-positive and Gram-negative organisms
Nucleic acid synthesis inhibitors	Fluoroquinolones	Some Gram-positive and some Gram-negative organisms
	Metronidazole	Obligate anaerobes

Pharmacokinetic Considerations

Pharmacokinetics refers to the disposition of drugs in the body and includes issues related to absorption, distribution, bioavailability, metabolism, and elimination. The access of antibiotics to the site of infection depends on such factors as their route of administration, plasma-protein binding, concentration of the free drug in plasma and extracellular fluid, and passive diffusion into foci of infection. Although an oral route of drug administration is preferred, parenteral administration of antibacterial agents is usually recommended in seriously ill patients to ensure a predictable concentration of the drug. Other important pharmacokinetic considerations include issues related to hepatic biotransformation and renal excretion.

Table 4-3. Protein Synthesis Inhibitors and Their Spectra

Class	Subclass	Drug	Antibacterial Spectra
50S ribosomal inhibitors	Macrolides	Erythromycin base, stearate, estolate, ethyl succinate, and dirithromycin	Gram-positive and some Gram-negative aerobes
		Clarithromycin and azithromycin	Gram-positive and some Gram-negative aerobes and anaerobes
	Lincosamides	Clindamycin	Gram-positive cocci and most Gram-negative oral anaerobes
30S ribosomal inhibitors	Tetracyclines		Gram-positive and Gram-negative organisms
	Aminoglycosides	Gentamicin, tobramycin, amikacin	Aerobic and facultative Gram-negative bacilli

Pharmacotherapeutic Considerations

Oral bacterial infections primarily affect the teeth (caries) and pulpal, periodontal, or pericoronal tissues. Patients commonly present with pain, erythema, and edema, and report difficulty chewing. In the management of these conditions, the routine use of antibacterial agents has not been shown to be effective. However, odontogenic infections that have not been treated in a timely manner or that have failed to respond to debridement (primary dental intervention) may spread into anatomical spaces contiguous with fascial planes and lead to serious, even life-threatening situations (e.g., Ludwig angina, mediastinitis, osteomyelitis, or cavernous sinus thrombosis), especially in immunocompromised patients.

When patients present with malaise, chills (fever), trismus, rapid respiration, lymphadenopathy, swelling, and hypotension, appropriate "surgical" intervention (e.g., drainage, irrigation, debridement) with adjuvant antibacterial chemotherapy is indicated. Similarly, when transient bacteremia may adversely affect the general health of the patient, antibacterial prophylaxis may be appropriate. Table 4-4 outlines principal considerations associated with the administration of antibacterial agents in the oral health care setting. In selecting the most effective and least toxic drug among several available alternatives, clinicians must also consider antibacterial resistance patterns, i.e., genetic, acquired, and biofilm-related drug resistance.

Mechanisms of bacterial drug resistance

Genetic drug resistance. Natural or intrinsic drug resistance is inherent in the molecular or species characteristics of bacteria. Certain *Streptococcus* and *Actinomyces* species lack the enzyme nitroreductase, which is necessary to convert metronidazole to its active metabolites. Alternatively, certain isolates of *Prevotella* do not take up metronidazole as readily as do susceptible isolates. Many oral Gram-negative anaerobes appear to be resistant to most macrolides because the structure of the outer bacterial cell membrane restricts entry of these drugs. Drug resistance may also be the result of spontaneous mutation at a genetic locus. Modification of penicillin-binding proteins (PBP) may preclude beta-lactam antibiotics to interact with their receptors. Other mutational changes in DNA may alter cell membrane permeability to and uptake of beta-lactam antibiotics or lead to the synthesis of beta-lactamases, widespread among both Gram-positive and Gram-negative bacteria.

Acquired drug resistance. Most organisms acquire drug resistance by gaining genetic material from other bacteria by three main mechanisms: (1) transformation, segments of free DNA released by dead bacteria are acquired from the surrounding environment; (2) transduction, the transfer of bacterial DNA among bacteria in the form of bacteriophages; and (3) conjugation, direct transfer of extra chromosomal plasmid DNA between bacteria. As a result of acquired resistance, staphylococci and many Gram-negative bacteria now synthesize beta-lactamases and certain beta-lactamases produced by Gram-negative bacteria also confer resistance to clavulanic acid. Acquired resistance to beta-lactams as a result of structural changes in PBP is prevalent in Gram-positive cocci, in particular *S. oralis*, *S. sanguis*, and *S. mitis*. Certain bacteria block ribosomal receptor sites; a mechanism responsible for macrolide resistance and because of microsomal receptor overlap, these bacteria will also be resistant to clindamycin. Still other bacteria acquire resistance to macrolides and tetracyclines by the activation of efflux pumps. Macrolide- and tetracycline-induced

Table 4-4. Principal Considerations in Antibacterial Chemotherapy

- Establish a clear indication for antibacterial chemotherapy:
  - The patient presents with malaise, fever, chills, trismus, rapid respiration, swelling, lymphadenopathy, or hypotension
    - The signs and symptoms of infection escalated rapidly (within 24–48 hours)
    - Oral soft tissue swelling appears to be spreading into adjacent anatomical spaces and affects breathing and swallowing
- Determine the patient's health status:
  - Systemic considerations (heart disease, total joint replacement, neutropenia, splenectomy, diabetes mellitus, end-stage renal disease, organ transplant, HIV infection, hepatic dysfunction, pregnancy, and immune status)
  - History of adverse drug events
  - Potential drug-drug interactions
- Select an appropriate antibacterial agent with a narrow spectrum and low toxicity:
  - Immune status of the patient
    - Bactericidal versus bacteriostatic antibacterial agent
      - Empirical therapy (correlate to most likely organisms associated with odontogenic infections)
      - Focused therapy (correlate to culture and susceptibility tests)
- Establish dosage regimen, duration of therapy, and route of administration:
  - Consider the seriousness of the illness
  - Consider potential compliance issues (refer to Chapter 1: *General Principles of Pharmacology*)
- Follow-up in 48 to 72 hours; note that patients initially presenting with signs of impending airway compromise, marked trismus (< 25 mm), or dehydration (e.g., marked malaise, disorientation, tachycardia) should be admitted to the hospital for urgent or emergency care.
  - Determine efficacy
    - Inadequate bacteriological information
    - Administration of suboptimal doses of the antibacterial agent
    - Inadequate debridement
      - Ability of the drug to reach the site of infection
  - Monitor patient for adverse drug effects (refer to Chapter 2: *Adverse Drug Events*)

activation of efflux pumps also affects the intracellular concentration of beta-lactams and beta-lactamase inhibitors.

Biofilm-related drug resistance. Bacteria isolated with standard microbiological techniques tend to be the free-swimming or planktonic form and most of what we know about bacteria is limited to their individual characteristics. It is axiomatic, then, that antibacterial agents in current use were identified on the basis of their activity against cultures of individual cells. As noted previously, if bacteria are resistant to an antibiotic, they are resistant because they, as individuals, carry a gene that confers resistance. But in nature, bacteria live in biofilms, a state that allows them to work together. Specific gene products initiate the association of planktonic bacteria with tissue and other surfaces.

As bacteria move onto a surface, the dynamic process of biofilm formation begins. Further organization of the biofilm into complex structures is regulated by the exchange of chemical signals between microorganisms by a process known as quantum sensing. The bacteria stack up and encase themselves in a hydrated matrix of polysaccharide and protein. As the cells grow and multiply and produce more matrixes, they form tower-like structures called "mushrooms." These mushrooms, which are about 85% matrix material, typically contain several thousand bacteria, and are pierced with channels that allow nutrients to reach the interior and waste products to be carried away.

Once in a biofilm, bacteria are protected from antibodies and phagocytosis, and appear to be exponentially more resistant to antibacterial agents than when they were in their free-swimming planktonic form. The mechanisms of resistance to antibacterial agents in biofilms appear to have three plausible explanations. The first hypothesis suggests slow and incomplete penetration of antibacterial agents into the biofilm. This may be a result of the biofilm matrix interacting with and neutralizing the drug and/or the matrix containing extracellular beta-lactamases. The second hypothesis is predicated on an altered chemical microenvironment within the biofilm. The accumulation of metabolic waste products from bacteria can inhibit or inactivate antibacterial agents or change the relative proportions of porins in a way that reduces cell permeability to a drug. Additionally, oxygen may be completely consumed in the surface layers and lead to anaerobic predominance in the deeper layers of the biofilm. The third possibility is that a subpopulation of bacteria in biofilms differentiates into a unique phenotype, which assumes a very low metabolic state that is almost spore-like. Because most antibacterial agents target rapidly dividing cells, cells in this quiescent state may survive exposure and become reactivated when the antibacterial drug is withdrawn.

Strategies for the selection of adjunctive antibacterial agents

Primary line of treatment. Unless the patient has an allergy to penicillin, the appropriate empirical drug of choice for the initial treatment of an odontogenic infection is penicillin VK (Table 4-5). It has good activity against most oral facultative Gram-positive cocci and Gram-negative anaerobes. Most odontogenic infections will require 5 days of antibacterial chemotherapy. Begin with a loading dose, followed by maintenance doses for the remainder of the time. The patient should be instructed to notify the clinician if symptoms do not resolve in 2 to 3 days. In such circumstances, it is prudent to reevaluate the patient because this may indicate noncompliance or a bacterial drug resistance, which may necessitate modification to the therapeutic regimen and/or a culture and susceptibility test.

Table 4-5. Sample Prescriptions for the Treatment of Odontogenic Infections

Primary Line of Treatment

R_x
Penicillin VK, 500-mg tabs
Disp. 21 tabs
Sig. Take 2 tabs stat, then 1 tab qid until all are taken.

R_x
Metronidazole, 500-mg tabs
Disp. 29 tabs
Sig. Take 2 tabs stat, then 1 tab qid until all are taken.

Secondary Line of Treatment

R_x
Azithromycin, 250-mg tabs
Disp. 6 tabs
Sig. Take 2 tabs stat, then 1 tab qid until all are taken.

Tertiary Line of Treatment

R_x
Clindamycin, 300-mg tabs
Disp. 29 tabs
Sig. Take 2 tabs stat, then 1 tab qid until all are taken.

Some Gram-positive (*S. oralis, S. sanguis,* and *S. mitis*) and Gram-negative organisms exhibit resistance related to structural changes in penicillin-binding proteins. In addition, staphylococci and many Gram-negative bacteria can synthesize beta-lactamase enzymes, which hydrolyze beta-lactam antibiotics. A therapeutic strategy to counter such resistance is to administer broad-spectrum penicillins, i.e., amoxicillin or amoxicillin in combination with clavulanic acid, a beta-lactamase inhibitor. Unfortunately, amoxicillin is also beta-lactamase susceptible and certain beta-lactamases produced by Gram-negative bacteria now confer resistance to clavulanic acid as well. Consequently, the administration of broad-spectrum penicillins offers little therapeutic advantage over penicillin VK in the management of odontogenic infections.

If no significant improvement is noted with penicillin VK in 48 to 72 hours, the empirical addition (for 7 days) of metronidazole to penicillin VK is reasonable because it is beta-lactamase resistant (Table 4-5). Whereas certain oral microorganisms such as *Streptococcus* species, *Actinomyces* species, and *Actinobacillus actinomycetemcomitans* exhibit natural or intrinsic resistance to metronidazole (they lack the enzyme nitroreductase necessary to convert metronidazole to its active metabolites), metronidazole in combination with penicillin VK provides excellent coverage for mixed odontogenic infections dominated by obligate anaerobes.

Secondary line of treatment. Erythromycin, a member of the macrolide class of antibiotics, has been suggested as the empirical drug of choice for the treatment of odontogenic infections in patients who are allergic to beta-lactam antibiotics. However, many oral Gram-negative anaerobes have natural or intrinsic resistance to macrolides because the structure of the outer bacterial cell

membrane restricts entry of the drug. Resistance to erythromycin has also been related to the ability of certain microorganisms to block ribosomal macrolide receptor sites. Unfortunately, this mechanism contributes not only to macrolide resistance, but because of microsomal receptor overlap, these microorganisms will be resistant to clindamycin as well. Finally, some bacteria have developed resistance to macrolides by activating efflux pumps, which act to remove intracellular macrolides, and these efflux pumps can also affect the intracellular concentration of beta-lactam antibiotics and beta-lactamase inhibitors.

Although few data demonstrate the efficacy of clarithromycin and azithromycin in the treatment of odontogenic infections, these newer macrolide antibacterial agents may be better alternatives to the other erythromycins because of their extended spectrum against facultative and some obligate anaerobes, more favorable tissue distribution, fewer adverse effects, and a once-a-day (azithromycin) or twice-a-day (clarithromycin) dosage schedule (Table 4-5). However, their substantially higher cost and the association with sudden cardiac death syndrome after administration of macrolides (with the exception of azithromycin) are compelling reasons to recommend clindamycin as a more appropriate alternative for patients allergic to beta-lactam antibacterial agents.

Tertiary line of treatment. A patient's use of beta-lactam antibiotics in the recent past increases the likelihood for the emergence of beta-lactamase–producing bacteria. When a patient presents with an unresolved odontogenic infection after treatment with a beta-lactam antibacterial agent, the empirical administration of a beta-lactamase–stable antibacterial drug, such as clindamycin, should be considered (Table 4-5). Similarly, the initial empirical drug of choice for the treatment of severe odontogenic infections is also clindamycin. It is not only beta-lactamase resistant but also has excellent activity against Gram-positive cocci and most oral Gram-negative anaerobes.

Some authorities point to clindamycin as an increasingly attractive choice in the treatment of all odontogenic infections, but concerns about associated adverse gastric side effects (i.e., pseudomembranous colitis), higher cost, and, importantly, the potential for drug resistance to clindamycin should prompt caution in using it as a primary line of treatment. Other available antibacterial agents are not indicated as initial empirical choices in the management of odontogenic infections. The prescription of other drugs should be predicated on the results of susceptibility testing. When culture and susceptibility results are available, the empirical agent(s) should be changed to the narrowest-spectrum effective antibacterial drug(s).

Strategies for antibacterial prophylaxis

Most antibacterial agents prescribed by dental practitioners are for prevention rather than treatment of an established infection. In general, when a single effective drug is used to prevent infection by a specific microorganism, or to eradicate it immediately or soon after it has become established, chemoprophylaxis is frequently successful. Consequently, chemoprophylaxis may be appropriate to prevent secondary bacterial infection in some patients who are ill with other diseases in an effort to minimize morbidity and mortality. However, before prescribing antibacterial agents to prevent illness, the clinician should weigh the benefits and risks not only to the patient but also to the community.

The patient with cardiovascular abnormalities. The American Heart Association (AHA) has published guidelines for the prevention of infective endocarditis (IE) in at-risk patients in association with invasive dental procedures. The recommendations stratify cardiac conditions as to the risk of developing endocardi-

tis and the severity of the ensuing morbidity. (See the AHA Recommendations for the Prevention of Bacterial Endocarditis found on the inside front cover.)

Antibacterial prophylaxis is recommended before dental therapy that is expected to result in significant bleeding in patients with high-risk or moderate-risk cardiac conditions. The guidelines clearly distinguish among dental procedures that are strongly associated with significant transient bacteremia and those that are not. Antibacterial prophylaxis is recommended when it is anticipated that significant bacteremia-producing procedures will be performed.

In situations where no chemoprophylaxis was given, but in which unexpected bleeding occurred, the institution of antibacterial prophylaxis within 2 hours is recommended. For at-risk patients already taking one of the indicated antibacterial agents, it is recommended that a drug from a different class be prescribed for chemoprophylaxis. Clinicians should allow at least 9 to 14 days between appointments to reduce the risk of development of resistant organisms.

The patient with total joint replacement. The American Dental Association (ADA), in cooperation with the American Academy of Orthopedic Surgeons (AAOS), publishes guidelines, with periodic updates, for the dental management of patients following total joint replacement (TJR). (See the ADA/AAOS recommendations for Antibiotic Prophylaxis for Dental Patients with Total Joint Replacement found on the page opposite the inside front cover.) Under these guidelines, only patients with one or more high-risk conditions should be considered for antimicrobial prophylaxis before undergoing invasive dental procedures. It should be noted that these guidelines, in a manner similar to those set forth by the AHA, represent a consensus, and as such, are not absolute.

The neutropenic patient. Severely neutropenic patients are at risk of developing infection caused by pathogens in the normal oral flora. Because of their depressed immune status, the normal clinical signs associated with an oral infection (i.e., erythema, pain, swelling) may be absent. The provision of necessary invasive dental treatment in the severely neutropenic patient should be coordinated with the patient's physician, ideally an infectious disease specialist. Fever must be aggressively investigated and, when possible, culture and susceptibility testing should be performed. For ambulatory patients with suspected bacteremia, the administration of oral ciprofloxacin combined with amoxicillin/clavulanic acid is often effective.

The asplenic patient. Organisms not typically found in the oral cavity cause the vast majority of cases of postsplenectomy sepsis syndrome. Antibacterial prophylaxis before dental treatment is not routinely recommended. However, because of the patient's impaired immune status, when an oral infection occurs, practitioners are advised to consult with the patient's physician to determine the patient's overall medical status. Consultation is particularly important if the patient had a splenectomy within the past 2 years and/or is a child. Asplenic patients should be advised of the importance of maintaining meticulous oral hygiene and should undergo frequent observation to monitor compliance.

The patient with diabetes mellitus. The increased risk of infection associated with poor glycemic control and the potential for poor wound healing observed in the diabetic patient has led some to advocate the administration of antibacterial prophylaxis before dental therapy. It is clear that any infection in the diabetic patient, including periodontal disease, must be managed promptly and aggressively. In addition, the patient must practice meticulous oral hygiene and should be reevaluated on a regular basis to monitor oral health and compliance. As a general rule, diabetic patients with good glycemic control can be treated in a routine manner, whereas diabetic patients with poor glycemic con-

trol and those suspected of having diabetes should be referred for medical evaluation before the delivery of elective dental care. Medical consultation is further recommended when the planned dental therapy is expected to have an adverse impact on glycemic control.

The patient with end-stage renal disease. The increased risk of access site infection and the increased risk of IE in patients undergoing hemodialysis have led many authorities to advocate the provision of antibacterial prophylaxis before invasive dental procedures. For dialysis patients with an underlying AHA-defined cardiac risk condition, such recommendations are logical and prudent. However, no studies have directly addressed the impact of orally related bacteremia on dialysis patients. More importantly, the dramatic increase in bacterial drug resistance observed in this patient population warrants caution. Therefore, the decision to use antibacterial prophylaxis and the specific regimen chosen should be determined in consultation with the patient's physician.

The patient with a transplanted organ. No studies address either the need for or benefit of providing antimicrobial prophylaxis to cover dental procedure–induced bacteremia in the patient who had a previous organ transplant. It could be argued that the patient's drug-induced immunosuppression and increased infection risk support a need to provide prophylaxis to cover invasive dental procedures. However, the complexity of the decision-making process is further complicated by the fact that the transplant patient may already be receiving a prophylactic antibiotic regimen. It is therefore recommended that the clinician consult closely with the patient's physician to determine the need for and specifics of the antimicrobial prophylactic regimen.

The patient with HIV infection. No studies have determined either the need for or the benefit of providing antimicrobial prophylaxis to cover bacteremia-producing dental procedures in patients with HIV infection. Patients with little or no evidence of immunosuppression or other HIV-associated complications can usually be treated in a routine manner. Because of the complex and ultimately progressive nature of HIV-related diseases, antibacterial prophylaxis before invasive dental procedures should be undertaken only in consultation with the patient's physician. Patients with HIV infection must practice meticulous oral hygiene and should be seen frequently to monitor their oral health status, which may reflect progressing immune impairment.

Adverse drug events

Drugs seldom exert their beneficial effects without also causing adverse effects. The inevitability of this therapeutic dilemma lends credence to the statement that there are no "absolutely" safe biologically active agents. To minimize the incidence of a drug's adverse effects, the clinician should consider the diagnosis, the need for antibacterial chemotherapy, the benefits versus the risks of drug therapy, the need to individualize the drug regimen, the need to educate the patient, and the importance of follow-up.

Drug-drug interactions. Two or more drugs administered in therapeutic dosages at the same time or in close sequence may act independently, may interact to increase or diminish the effect of one or more drugs, or may interact to cause an unintended reaction. Drug-drug interactions may be complex and even unexplained, but they all seem to have either a pharmacodynamic or a pharmacokinetic basis, because the same pharmacological mechanisms that account for a drug's efficacy account for many of its adverse effects. Potentially serious drug-drug interactions can occur between antibacterial agents and other medications. By reviewing the patient's medical history, the clinician can identify drugs taken by the patient and avoid prescribing antibacterial agents that may produce potential drug-drug interactions.

Antibacterial agents and oral contraceptives. No pharmacokinetic data at this time support the contention that antibacterial agents reduce the efficacy of oral contraceptives, except for rifampin, an antituberculin drug. The U.S. District Court for the Northern District of California also concluded that "scientific evidence regarding the alleged interaction between antibacterial agents and oral contraceptives did not satisfy the *Daubert* standard of causality." However, the American Dental Association Council on Scientific Affairs recommends that patients be advised of the potential risk and consider alternative contraception during periods of antibacterial chemotherapy, and that patients be advised of the importance of compliance with their oral contraceptive regimen.

Antibacterial drugs and pregnancy. There is no firm evidence that any antibacterial agent is teratogenic in humans; however, drugs in general should be prescribed with caution for pregnant women. (Refer to Chapter 1: *General Principles of Pharmacology* and Chapter 2: *Adverse Drug Events*.) Table 4-6 summarizes the known prenatal risks of antibacterial agents recommended for the empirical treatment of odontogenic infections.

Gastrointestinal disturbances. Oral antibacterial agents, especially the macrolides, often cause gastrointestinal disturbances characterized by acute onset of nausea, retching, and vomiting, and often diarrhea. If the patient has been taking the antibacterial agent for 1 to 2 days, diarrhea is probably a result of the mild irritating action of the antibacterial agent. If the patient complains of bloody diarrhea with lower abdominal cramping and is currently taking (or has taken in the recent past) clindamycin or broader spectrum antibacterial agents, the clinician must consider the possibility of superinfection with *Clostridium difficile*, the most dangerous and potentially fatal presentation of which is pseudomembranous colitis.

Table 4-6. Safety of Antibacterial Drugs in Pregnancy

Drug	FDA Pregnancy Risk Category	Fetal Toxicity	Recommendations
Penicillins	B[1]	None known	Probably safe
Metronidazole	B[1]	None known; carcinogenic in rats and mice	Caution—use only for strong clinical indication in the absence of a suitable alternative
Azithromycin	B[1]	None known	Probably safe
Clindamycin	C[2]	None known	Caution—use only for strong clinical indication in the absence of a suitable alternative

[1] Category B: Either animal studies do not indicate a risk to the fetus and there are no controlled studies in women, or animal studies have shown an adverse effect but controlled studies in women failed to demonstrate risk.

[2] Category C: Either animal studies do not indicate fetal risk and there are no controlled studies in women, or studies in women and animals are not available.

Oral candidiasis. Superinfections with *Candida* organisms commonly occur in association with antibacterial chemotherapy. The oral mucosal lesions appear as white, raised, or cottage cheese–like growths that can be scraped off, leaving a red, sometimes hemorrhagic, base. Candidiasis may also be manifest as an erythematous lesion, commonly associated with chronic dry mouth or found under a dental prosthesis. After becoming pathogenic, *Candida* organisms may spread to the esophagus or lungs via swallowing or droplet aspiration. In patients who are immunosuppressed, *Candida* organisms may spread systemically via the blood stream.

Allergic reactions. In general, the topical administration of an antibacterial agent is more likely to sensitize a patient than parenteral drug administration; in turn, parenteral drug administration is more likely to sensitize than an orally administered drug. Most allergic reactions tend to occur for the first time in young or middle-aged adults. The dose, duration, and frequency of drug administration are further confounding factors, and single doses tend to produce less sensitization than prolonged treatment. (Refer to Chapter 2: *Adverse Drug Events*.)

Drug resistance. The widespread and ever-increasing use of antibacterial agents has contributed to the development of antibacterial drug resistance. Current evidence suggests that unless health care providers change their prescriptive habits, many of the currently available antibacterial agents may become ineffective. When antibacterial agents are used appropriately to treat infections or to prevent life-threatening infections in high-risk patients, clinicians must accept the ecological consequences of antibacterial chemotherapy. However, antibacterial agents should not be routinely prescribed to prevent infections, or to manage mild infections, particularly when other preventive or therapeutic means (e.g., primary dental care) are available.

CONCLUSION

Most odontogenic infections can be resolved satisfactorily with timely primary dental care. The routine use of antibacterial agents for the management of odontogenic infections is not advocated. Clinicians must be cognizant of the fact that drugs, including antibacterial agents, seldom exert their beneficial effects without also causing adverse effects, including bacterial drug resistance. Before instituting antibacterial chemotherapy, clinicians should consider the diagnosis, the need for antibacterial chemotherapy, the benefits versus the risks of drug therapy, and the importance of follow-up care, as well as individualizing the drug regimen and educating the patient. As should be the case for all aspects of clinical practice, the decision to initiate antibacterial therapy should be based on sound principles of evidence-based medicine.

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5 Medical Management of Selected Oral Conditions

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INTRODUCTION

Although most oral conditions are self-limiting, they often produce enough discomfort, concern, or embarrassment to prompt the patient to seek some form of therapy. In addition, the epidemiological association of some of these conditions with neoplasia has placed health care professionals under increased pressure to treat such lesions to reduce not only the discomfort, but also the potential risk of neoplastic changes. In some instances, treatment is also required to minimize the likelihood that the patient will transmit an infection to others. As the scope of oral medicine continues to expand, the dental professional is confronted with ever-increasing advertising and promotion of prescription drugs, paralleled by excessive public faith in the efficacy of such drugs. The intent of this chapter is to discuss the diagnosis of common orally related primary and secondary conditions and their established management protocols.

ACTINIC CHEILOSIS

Actinic cheilosis is the labial equivalent of actinic keratosis and, as such, represents the early clinical manifestation of a continuum, which may ultimately progress to squamous cell carcinoma. The cause of actinic cheilosis is chronic exposure to sunlight, especially from an early age. Although ultraviolet-B (UV-B) radiation is principally responsible, ultraviolet-A (UV-A) radiation adds to the risk. Other risk factors include a fair complexion, outdoor occupations, and immunosuppression. Men are affected more often than women, and although most cases occur in men after the age of 40, the condition is increasingly being diagnosed in younger men.

Diagnosis

The diagnosis is based on history and clinical findings. The lip appears dry, mottled, and opalescent, with white or gray plaques that are slightly elevated and cannot be stripped off (see Insert, Figure 5-1). Isolated areas of hyperkeratosis may also be evident. Lip pliability or elasticity may be decreased and the normally distinct definition of the vermilion-cutaneous border may be lost. Other clinical signs include erythematous or hemorrhagic areas, parallel marked folds, and an unobtrusive "chapped lip" appearance.

Management

The potentially progressive nature of actinic cheilosis to squamous cell carcinoma emphasizes the need for early recognition and implementation of preventive and therapeutic strategies. Any time a lesion exhibits induration, ulceration, bleeding, rapid growth, or pain, an immediate biopsy is indicated.

Prevention

The American Cancer Society recommends avoiding sun exposure when UV rays are strongest (10 AM to 4 PM); covering up exposed skin; wearing a hat that shades the neck, face, and ears; wearing sunglasses; and using a sunscreen. The patient should consistently use a broad-spectrum sunscreen product with an SPF of 30 or higher. Ideally, the product chosen should block both UV-B and UV-A (formulations containing zinc oxide, avobenzone, or Mexoryl) and be specifically formulated for use on the lip. Sunscreen should be applied liberally 15 to 30 minutes before anticipated exposure and reapplied liberally after any vigorous activity that may wash or rub the sunscreen away.

Broad-spectrum sunscreens

℞ Blistex Clear Advantage [OTC]
Disp: 1 tube
Sig: Apply to lip 30 minutes prior to sun exposure and every hour thereafter while in the sun.

℞ Burnout Waterproof SPF 32 Lip Balm [OTC] *(multiple flavors)*
Disp: 1 tube
Sig: Apply to lip 30 minutes prior to sun exposure and every hour thereafter while in the sun.

℞ ChapStick Ultra Moisturizing Lip Balm, SPF 30 [OTC] *(multiple flavors)*
Disp: 1 stick
Sig: Apply to lip 30 minutes prior to sun exposure and every hour thereafter while in the sun.

HERPETIC INFECTIONS

Herpetic infections are caused by either herpes simplex virus type-1 (HSV-1) or herpes simplex virus type-2 (HSV-2). A unique feature of these viruses is their ability to establish latency following primary infection and, thus, create the potential for recurrence. An estimated 500,000 cases of primary infection and 100 million cases of recurrent infection occur annually in the United States.

DIAGNOSIS

The diagnosis of herpetic infections is based on history and clinical findings. Laboratory tests such as Tzanck smear, serology, and culturing are rarely necessary, but assist in the diagnosis of equivocal cases.

Primary herpetic infection

Most primary infections are asymptomatic or mildly symptomatic and typically occur between 2 and 3 years of age. Symptomatic primary infection usually presents as herpetic gingivostomatitis. Nonspecific prodromal signs and symptoms of fever, malaise, irritability, headache, and cervical lymphadenopathy typically occur 1 to 3 days before the development of painful oral lesions characterized by widespread vesicular eruptions and gingival inflammation (see Insert, Figures 5-2 and 5-3). All oral soft tissues may be affected. Within a few days, the vesicles coalesce, rupture, and form large, irregularly shaped erosions or ulcerations. The lesions heal without scarring in 1 to 2 weeks. In some cases the pain may be intense and interfere with eating and drinking, placing the patient at risk for dehydration and malnutrition. Conditions that predispose to systemic dissemination include immunologic immaturity, malignancy, malnutrition, pregnancy, and therapeutic or acquired immunosuppression.

Recurrent herpetic infection

Following primary infection, an estimated 15% to 40% of the patients experience recurrence, most commonly recurrent herpes labialis (RHL). Patients usu-

ally relate prodromal sensations of tingling, itching, burning, or pain before the eruption of the characteristic focal vesicular lesions affecting the lip vermilion (see Insert, Figure 5-4) or other perioral sites such as the skin or ala of the nose. The vesicles rapidly rupture and crust, with ultimate uneventful healing occurring within 2 weeks. Viral shedding precedes the prodromal period and continues into convalescence; when this occurs, the patient should be considered infectious. This can lead both to autoinoculation and cross-infection. Less frequently observed are intraoral recurrent herpetic eruptions (see Insert, Figure 5-5). Small clusters of lesions are usually restricted to the keratinized mucosa. Numerous trigger factors such as ultraviolet radiation, trauma, menstruation, fever, and immunosuppression have been implicated. In immunocompromised patients the lesions are usually more severe and recovery is protracted.

Management

There exists no cure for HSV and its establishment of latency. Therapy is tailored to the individual patient, taking into account the severity of the infection and the patient's overall health.

Primary line of therapy for primary herpetic infection

Strategies are targeted to ensure adequate hydration and nutrition and provide palliation. A topical anesthetic agent such as diphenhydramine hydrochloride or lidocaine viscous and, if necessary, a systemic analgesic should be prescribed. When topical anesthetics are used, the patient or guardian should be warned that these agents may increase the risk of self-induced trauma, may interfere with the pharyngeal phase of swallowing, and may lead to aspiration. Systemic analgesics such as acetaminophen and, in rare instances, an acetaminophen/codeine formulation may have to be prescribed. Aspirin should be avoided for children younger than 18 years of age because of the risk of Reye syndrome.

Nutritional supplements

℞ Ensure Plus [OTC]

Disp: 25 cans

Sig: Three to 5 cans in divided doses throughout the day. Serve cold.

℞ Carnation Instant Breakfast [OTC] *(various flavors)*

Disp: 1 package

Sig: Three to 5 servings daily. Prepare as indicated on label.

Topical anesthetic agents

℞ Diphenhydramine (Children's Benadryl) elixir 12.5 mg/5 mL [OTC]

Disp: 8 ounces

Sig: Rinse with 1 teaspoonful every 2 hours and spit out.

℞ Diphenhydramine (Children's Benadryl) elixir 12.5 mg/5 mL [OTC] 4 ounces mixed with Kaopectate or Maalox [OTC] 4 ounces (50% mixture by volume)

Disp: 8 ounces

Sig: Rinse with 1 teaspoonful every 2 hours and spit out.

℞ Lidocaine (Xylocaine) viscous 2%

Disp: 100 mL

Sig: Rinse with 1 teaspoonful for 1 minute and expectorate, before meals and at bedtime.

Systemic analgesics

℞ Acetaminophen (Tylenol), 325-mg tablets

Disp: 50 tablets

Sig: Take 2 tablets every 4 to 6 hours for pain and fever. Do not exceed 4 g per 24-hour period.

℞ Acetaminophen 300 mg with codeine 30 mg (Tylenol with Codeine) tablets

Disp: 24 tablets

Sig: Take 1 to 2 tablets 4 times a day for pain.

Secondary line of therapy for primary herpetic infection

Patients with a primary herpetic infection who are immunocompromised, manifest immunologic immaturity, or present with evidence of systemic dissemination should be promptly referred for medical evaluation and management. Possible signs and symptoms of dissemination include the presence of extraoral lesions, conjunctivitis, ocular pain, visual impairment, lethargy, dysphagia, hemiparesis, or seizure.

Primary line of therapy for recurrent herpetic infection

RHL, while often painful and at times unsightly, is self-limiting and often requires no treatment. All patients should be advised to avoid touching the lesion and practice good hygiene to reduce the risk of autoinoculation. A wide variety of OTC topical agents are marketed to provide palliation and promote the healing of RHL. However, docosanol (Abreva) is the only OTC formulation specifically approved by the Food and Drug Administration (FDA) for the treatment of RHL. For patients who manifest frequent recurrent episodes or who otherwise desire antiviral therapy, the FDA has approved three prescription antiviral agents. Regardless of the agent chosen, therapy is most effective when initiated during prodrome. Finally, prescribing a lip balm with an SPF of 15 or greater may prevent future RHL.

Antiviral agents

℞ Docosanol (Abreva) cream [OTC]
Disp: 2-gram tube
Sig: Apply to affected area 5 times per day during waking hours for 4 days. Initiate therapy promptly at prodrome.

℞ Penciclovir (Denavir), 1% cream
Disp: 2-gram tube
Sig: Apply to affected area every 2 hours while awake for 4 days. Initiate therapy promptly at prodrome.

℞ Acyclovir (Zovirax), 5% cream
Disp: 2-gram tube
Sig: Apply to affected area 5 times per day. Initiate therapy promptly at prodrome.

℞ Valacyclovir (Valtrex), 1,000-mg tablets
Disp: 4 tablets
Sig: Take 2 tablets twice a day for 1 day.

Sunscreen for prevention

℞ Blistex Clear Advantage [OTC]
Disp: 1 tube
Sig: Apply to lip 30 minutes prior to sun exposure and every hour thereafter while in the sun.

Recurrent intraoral herpetic lesions typically occur as an isolated event associated with an antecedent traumatic event, such as may occur with dental manipulation. Such cases require only recognition, reassurance, and, if necessary, palliation with the application of a topical anesthetic.

Secondary line of therapy for recurrent herpetic infection

For the immunocompromised patient, antiviral therapy has been shown to be of benefit in reducing pain and accelerating healing. To improve patient compliance, oral famciclovir may be a better alternative to topical acyclovir ointment. For all cases, therapy is most effective when initiated during prodrome.

℞ Famciclovir (Famvir), 125-mg tablets
Disp: 10 tablets
Sig: Take 1 tablet twice a day.

℞ Acyclovir (Zovirax), 5% ointment
Disp: 3-gram tube
Sig: Apply to affected area every 3 hours (6 times per day) for 7 days. Initiate therapy promptly at prodrome.

Tertiary line of therapy for recurrent herpetic infection

Patients with a recurrent herpetic infection who are nonresponsive to the above therapies or who present with evidence of possible dissemination should be promptly referred for medical evaluation and management.

CANDIDIASIS

Candidiasis is the most frequently occurring opportunistic fungal infection to affect humans. Whereas most cases are caused by *Candida albicans*, other species have been implicated, especially in immunosuppressed patients. *Candida albicans* is ubiquitous, as evidenced by its ability to exist in a commensal state in such areas as the skin and the gastrointestinal and genitourinary tracts. In the oral cavity, carriage rates of up to 75% have been reported. The shift from a state of commensalism to a pathogenic infection is almost always associated with an underlying predisposing factor. Established predisposing factors include immunosuppression, immunologic immaturity, certain medications, salivary changes, malignancies, numerous endocrinopathies, epithelial alterations, nutritional deficiencies, high-carbohydrate diet, poor oral hygiene, dental prostheses, advanced age, and smoking.

Diagnosis

In most cases, the diagnosis of oral candidiasis is based on clinical signs and symptoms. For equivocal cases, exfoliative cytology, culture, or biopsy may be necessary. Because many patients carry *C. albicans* in a commensal state, the presence of hyphae is usually required to confirm infection when using cytology. Patients with oral candidiasis may be asymptomatic or complain of a burning sensation, dysgeusia, or dysphagia. Oral candidiasis may manifest a variety of clinical presentations.

Pseudomembranous candidiasis is characterized by the presence of creamy, white, curdled milk–like papules or plaques on the mucosal tissues, most commonly affecting buccal and labial mucosa, palate, tongue, and oropharynx (see Insert, Figure 5-6). These lesions may be wiped away to expose an underlying erythematous base.

Erythematous candidiasis (atrophic) manifests as red patches, most commonly noted on the tongue dorsum or palate (see Insert, Figure 5-7). A burning sensation is often related by the patient. Erythematous candidiasis may occur in a patient wearing a dental prosthesis, in which case the erythema is usually limited to the denture-bearing surface.

Chronic hyperplastic candidiasis presents as white papules or plaques, most commonly affecting the buccal mucosa or tongue (see Insert, Figure 5-8). This variant cannot be easily wiped and represents the least commonly observed form.

Angular cheilitis presents as a discomforting cracking or fissuring of the lip commissures (see Insert, Figure 5-9) and frequently occurs in conjunction with other variants of oral candidiasis. Concurrent involvement of staphylococci and streptococci is the rule.

Median rhomboid glossitis is a unique form of candidiasis that appears as an erythematous area of papillary loss confined to the dorsal aspect of the tongue, just anterior to the circumvallate papillae (see Insert, Figure 5-10). Median rhomboid glossitis is frequently asymptomatic.

Management

Essential to any management strategy is a thorough review of the patient's medical and dental histories to identify predisposing factors. Acute cases attributed to short-term antibiotic therapy are usually easily managed, while chronic or recurrent cases attributed to a poorly controlled systemic disease may be more problematic and require medical referral. In all cases, the goals of therapy are to remove any predisposing factors when possible, to prevent further spread or dissemination, to provide symptomatic relief, and, when appropriate, to provide patient education to reduce the risk of recurrence.

Primary line of therapy

For mild localized lesions the use of a topical antifungal agent such as nystatin, clotrimazole, or ketoconazole is usually effective. Improvement should be noted within a week, at which time the topical therapy should be continued for another 3 to 5 days. The efficacy of topical formulations is largely dependent on prolonged contact time with the affected tissues. Thus, patients must be instructed on the appropriate use of topical therapies. Both nystatin solution and clotrimazole troches contain sucrose, which may limit their use in patients who are at high risk for caries. Topical fluoride agents should be used during prolonged therapy to reduce caries risk. In cases of candidiasis associated with a dental prosthesis, it is important to also treat the prosthesis. Specifically, the prosthesis should not be worn during sleep, but should be soaked in an antifungal solution. Most commercial denture solutions exhibit antifungal properties, as does nystatin solution, chlorhexidine gluconate, and sodium hypochlorite.

℞ Nystatin (Mycostatin) lozenges, 200,000 units/lozenge
Disp: 70 lozenges
Sig: Let 1 lozenge slowly dissolve in mouth 5 times per day.

℞ Nystatin suspension, 100,000 units/mL
Disp: 240 mL
Sig: Rinse with 1 teaspoonful for 2 minutes and swallow, 4 times per day.

℞ Clotrimazole (Mycelex), 10-mg troches
Disp: 70 troches
Sig: Let 1 troche slowly dissolve in mouth 5 times per day.

℞ Ketoconazole (Nizoral), 2% cream
Disp: 15-gram tube
Sig: Apply thin coating to affected areas after meals and at bedtime.

Secondary line of therapy

For patients nonresponsive to topical therapy or noncompliant or intolerant with its use, a systemic oral antifungal agent is often effective. Available drugs include ketoconazole, fluconazole, and itraconazole. Fluconazole is usually the drug of choice as it is readily absorbed and exhibits a better safety profile than ketoconazole. Itraconazole is usually reserved for treating candidiasis resistant to fluconazole.

℞ Fluconazole (Diflucan), 100-mg tablets
Disp: 15 tablets
Sig: Take 2 tablets stat, then take 1 tablet daily until gone.

Tertiary line of therapy

Patients at continual risk of candidiasis, such as may occur with HIV infection or other immunosuppressive disorders, are often placed on long-term systemic antifungal therapy. In such cases, long-term fluconazole therapy may prove effective, but the risk of developing resistance is high. Tertiary therapies fall under the purview of the patient's physician.

XEROSTOMIA

Dry mouth or xerostomia is not a specific disease entity, but it may occur in conjunction with a number of significant local and systemic factors (Table 5-1). It is quite common for the patient to manifest more than one factor contributing to his or her xerostomia.

Diagnosis

The diagnosis of xerostomia is usually readily made upon clinical examination. Characteristic clinical findings include a noticeable lack of wetness to the mucosal tissues and teeth; saliva that is thick and ropey; absence of saliva pooling in the floor of the mouth; red, dry, and atrophic mucosa; an atrophic and fissured tongue (see Insert, Figure 5-11); incisal and smooth surface caries; and candidiasis. When used as a retractor, the dental mirror will often stick to the xerostomic patient's buccal mucosa. Once the clinical diagnosis of a dry mouth is made, a careful and exhaustive review of the patient's medical history must be obtained to identify any predisposing factors.

Management

Depending on the etiology, treatment strategies for xerostomia may be either targeted or palliative and supportive, or both.

Primary line of therapy

Efforts to remove or reduce identified predisposing factors should be undertaken whenever possible. Underlying systemic disorders that predispose to xerostomia should be medically addressed. A consultation with the patient's physician is warranted to attempt to discontinue, reduce, or change any medica-

Table 5-1. Causes of Xerostomia

Local factors	• Reduction in salivary flow as a result of heavy smoking and alcohol intake, altered psychic states, and/or idiopathic conditions • Congenital absence or aplasia of one or more of the major salivary glands or ducts (rare) • Glandular hyperplasia associated with mumps, sialolithiasis, and sialoadenitis • Neoplasias, which usually affect an isolated gland (although there may be infiltration of multiple glands in leukemia and lymphoma)
Systemic conditions	• Uncontrolled diabetes mellitus • Sjögren syndrome, a relatively common condition that typically affects women between the ages of 40 and 60 and is characterized clinically by parotid enlargement and histologically by lymphocytic infiltration of the salivary glands • Collagen vascular or connective tissue disorders such as systemic lupus erythematosus, scleroderma, mixed connective tissue disease, and polydermatomyositis
Specific drug classes	• Anticholinergics • Antidepressants • Antihypertensives • Antipsychotics • Diuretics • Gastrointestinals • Antihistamines • Antineoplastics • Central nervous system stimulants • Systemic bronchodilators • A small number of cancer chemotherapeutic agents—the most problematic and profound form of xerostomia is seen secondary to external irradiation of the head and neck

tions that predispose to xerostomia. Patient education to reduce exposure to OTC medications that predispose to xerostomia should be provided. Patients should be advised to maintain hydration throughout the day; practice thorough and meticulous oral hygiene (specifically, use a fluoride dentifrice twice a day, 0.05% sodium fluoride rinses daily, and remove and clean prostheses at night); avoid products that irritate the mucosa (alcohol, tobacco, acidic or spicy food, and fruits and vegetables with high acid content); reduce their sugar intake; use xylitol-containing or sugar-free gums or candies to stimulate salivation; and use a humidifier at night. Alcohol-containing mouthrinses should be avoided because they have an additive drying effect on the mucosa.

Secondary line of therapy

Regardless of the etiology, the secondary line of therapy is added to the primary line of therapy and is focused on improving palliation, reducing oral disease progression, and improving the patient's quality of life.

Salivary substitute

A variety of salivary substitutes are available; however, these agents represent poor imitators of natural saliva and patient acceptance is notoriously poor.

℞ Sodium carboxymethyl cellulose 0.5% aqueous solution [OTC]
Disp: 8 ounces
Sig: Use as a rinse as needed throughout day.

℞ Commercial saliva substitute [OTC] (i.e., Entertainer's Secret, Breathtech, Moist Plus, Optimoist, OralBalance, Salivart, others)
Disp: 1 bottle
Sig: Use as a rinse as needed throughout day.

Sialagogues

For patients with residual salivary function, a sialagogue may prove beneficial. Pilocarpine (Salagen) is approved for the treatment of xerostomia associated with head and neck radiotherapy and Sjögren syndrome; cevimeline (Evoxac) is approved for the treatment of xerostomia associated with Sjögren syndrome. Either drug may be prescribed on a trial basis to improve salivary flow in all patients with xerostomia. They should be used with caution in patients with significant cardiovascular disease, asthma, chronic bronchitis, chronic obstructive pulmonary disease (COPD), cholelithiasis, biliary tract disease, and nephrolithiasis. Common side effects include sweating, headache, nausea, gastrointestinal upset, urinary frequency, rhinitis, and flushing. Either drug may be titrated to attempt to maximize effect while minimizing side effects.

℞ Pilocarpine HCl (Salagen), 5-mg tablets
Disp: 21 tablets
Sig: Take 1 tablet 3 times a day 0.5 hour before meals. Dose may be titrated to 2 tablets 3 times a day.

℞ Cevimeline (Evoxac), 30-mg capsules

Disp: 21 capsules

Sig: Take 1 capsule 3 times a day 0.5 hour before meals. Dose may be titrated to minimize side effects.

Chlorhexidine gluconate and supplemental fluoride for caries control

An alcohol-free formulation of chlorhexidine gluconate rinse and supplemental topical fluoride should be prescribed to reduce caries development. The additional application of a fluoride varnish on a regular basis may be beneficial. An antifungal agent is often necessary to address the near ubiquitous occurrence of candidiasis (see section on candidiasis, p. 87). Because of the lack of salivary flow in the patient with xerostomia, the use of a systemic antifungal agent is typically more tolerable and effective than topical formulations. Last, patients with xerostomia should be placed on an accelerated recall schedule, typically every 3 months.

℞ Chlorhexidine gluconate (alcohol-free formulation), 0.12% rinse

Disp: 16-ounce bottle

Sig: 0.5-oz rinse for 1 minute, twice a day, every day, for 2 weeks, followed by 0.5-oz rinse for 1 minute, twice a day, 1 to 2 days per week *for maintenance*.

℞ Commercial neutral fluoride (Acclean, Karigel-N, PreviDent 5000 Plus, Topex, Thera-Flur-N, others), 1.1% gel

Disp: 1 bottle

Sig: Apply to teeth 5 to 10 minutes daily in custom tray *(preferred method) or* use as a dentifrice once daily.

℞ Commercial stannous fluoride (Acclean Home Care gel, Gel-Tin, Omnii Gel, Plak Smacker, Stop, Take Home Care, others), 0.4% gel

Disp: 1 bottle

Sig: Apply to teeth 5 to 10 minutes daily in custom tray *(preferred method) or* use as a dentifrice once daily.

℞ Commercial fluoride varnish (Duraflor, Duraphat, CavityShield)

Sig: Apply to teeth after professional cleaning.

RECURRENT APHTHOUS STOMATITIS

Recurrent aphthous stomatitis (RAS) is recognized as the most commonly observed oral mucosal disease to affect humans. For most, RAS proves to be a localized self-limiting episodic annoyance. However for others, RAS may be so severe as to interfere with eating and drinking and/or be associated with an underlying, often serious, systemic condition. The specific etiology of RAS is unknown, but likely involves an alteration in the cell-mediated immune system. Possible contributing factors include local factors (trauma, toothpaste allergy or sensitivity), nutritional deficiencies (iron, folic acid, zinc, B_1, B_2, B_6, B_{12}), absorptive disorders (gluten-sensitive enteropathy, celiac sprue), food allergies, and other systemic conditions (Behçet disease, Crohn disease, systemic lupus erythematosus [SLE], cyclic neutropenia, HIV, Reiter syndrome).

Diagnosis

There are three distinct forms of RAS: minor, major, and herpetiform. The lesions typically are confined to the nonkeratinized oral mucosa. The diagnosis of RAS is usually easily established after obtaining a thorough history and noting the characteristic clinical presentation. Biopsy is rarely required, but may prove useful to rule out other conditions in the differential, such as lichen planus, mucous membrane pemphigoid, and pemphigus.

Minor RAS is by far the most common form and presents as recurrent, round, clearly defined, shallow ulcerations less than 1 cm in diameter (see Insert, Figure 5-12). The presence of an intense erythematous halo around the ulceration is characteristic. The patient may relate a prodrome of a localized altered sensation. The patient is afebrile but may present with discrete submandibular lymphadenopathy. Complete resolution without scarring occurs in 7 to 14 days.

Major RAS is similar in appearance to minor RAS, but the lesions are larger than 1 cm in diameter (see Insert, Figure 5-13). The ulcerations are deeper, often persist for weeks to months, and may heal with scarring. Their presence should raise the suspicion of the presence of a more serious underlying condition.

Herpetiform RAS is characterized by the clustering of numerous small (2- to 3-mm) shallow ulcerations on nonkeratinized mucosa (see Insert, Figure 5-14). The lesions may coalesce to form a more diffuse ulceration. Healing may take 1 to 4 weeks and scarring is possible.

Management

A primary goal in the management of RAS is to identify and eliminate or manage any contributory factors or conditions associated with the RAS. Appropriate medical consultation and/or referral is warranted for RAS associated with systemic conditions such as nutritional deficiencies, Behçet disease, and HIV. Targeted lesion therapy is aimed at providing palliation, promoting healing, and reducing recurrence.

Primary line of therapy

There are numerous OTC and prescription topical gels, creams, ointments, and rinses marketed for the treatment of RAS. Commonly found ingredients include corticosteroids, covering agents, antiseptics, oxygenating agents, anti-

inflammatory agents, cauterizing agents, and topical anesthetics. No validated studies exist to demonstrate the clinical superiority of any formulation over another. Problems related to the consistent application and retention of these agents often limit their effectiveness. Topical steroid ointments may be compounded with a mucosal adherent (i.e., Orabase) to improve and prolong retention. A rinse formulation may be more effective to treat widespread or hard-to-reach lesions. Topical corticosteroids predispose to oral candidiasis and prolonged use may lead to mucosal atrophy.

℞ Fluocinonide (Lidex), 0.05% ointment
Disp: 15-gram tube
Sig: Apply thin layer to lesions after each meal and at bedtime.

℞ Dexamethasone (Decadron) elixir, 0.05 mg/5 mL
Disp: 100 mL
Sig: Rinse with 1 teaspoon for 2 minutes 4 times a day and expectorate.

℞ Amlexanox (Aphthasol), 5% oral paste
Disp: 5-gram tube
Sig: Dab on lesion 4 times a day.

℞ Orabase Soothe-N-Seal Protective Barrier [OTC]
Disp: 1 package
Sig: Apply as per manufacturer directions every 6 hours as needed.

Secondary line of therapy

The secondary line of therapy entails the use of a systemic corticosteroid and is indicated for patients whose symptoms are not relieved by primary therapy or for patients whose initial presentation warrants a more aggressive treatment approach. Prednisone, prescribed at 1 mg/kg per day as a single morning dose for 1 to 2 weeks, is the most commonly chosen systemic corticosteroid for use. The development of secondary candidiasis is predictable; thus concurrent antifungal therapy is indicated. While short-term corticosteroid regimens are generally safe, the patient may experience insomnia, nervousness, indigestion, increased appetite, and weight gain. Relative contraindications include gastrointestinal ulcerations, diabetes, glaucoma, psychoses, renal disorders, osteoporosis, seizures, heart failure, and hypertension. The therapeutic response of RAS is usually rapid and dramatic; however, recurrence is likely. For some, when the lesions recur, the prompt application

of a topical agent will be all that is necessary to manage their RAS. Others will require occasional repeat, high-dose, short-term corticosteroids to control acute exacerbations.

> Rx
> Prednisone (Deltasone), 10-mg tablets
> *Disp*: 70 (*for a 70-kg patient*) tablets
> *Sig*: Take 7 tablets by mouth each morning with food or milk.

Tertiary line of therapy

A more aggressive therapeutic protocol is indicated for patients whose RAS is recalcitrant to secondary lines of therapy. Tertiary lines of therapy include chronic systemic corticosteroid regimens, chronic systemic corticosteroid regimens with steroid sparing agents, or thalidomide. All of these protocols are associated with potentially serious side effects and should only be undertaken in close cooperation with the patient's physician.

ORAL LICHEN PLANUS

The exact etiology of lichen planus is not known, but it is believed to be an autoimmune disease with a genetic predisposition. It is the most common dermatologic disease with oral manifestations. An estimated 65% of patients with dermal lichen planus experience oral lichen planus (OLP), with the buccal mucosa the most commonly affected site. Trauma, viral and bacterial infections, emotional stress, and drug therapy have all been implicated as precipitating factors. A possible association between OLP and oral squamous cell carcinoma mandates all cases of OLP be followed closely.

Diagnosis

Dermal lesions appear characteristically on the flexor surfaces of the arms and legs, but they may also involve other areas of the skin. They typically present as purple, polygonal, pruritic papules. Oral lesions may be present before, during, or after dermal eruptions, or they may represent the sole manifestation of the disease. Other common sites of occurrence include the tongue, lips, floor of mouth, palate, and gingiva. A simple classification system recognizes three forms of OLP: reticular, atrophic, and erosive.

Reticular OLP

Reticular OLP, the most frequently occurring form of OLP, is characterized by mucosal keratotic lines, plaques, or papules that often create a lacy or reticular pattern (Wickham striae) (see Insert, Figure 5-15). The patient may be unaware of this form of OLP, as it is typically asymptomatic.

Atrophic/Erosive OLP

Atrophic (erythematous) and erosive (ulcerated) areas may occur in reticular OLP (see Insert, Figure 5-16), frequently causing sufficient discomfort to induce the patient to seek treatment. Affected areas may range in size from a few millimeters to several centimeters.

All three forms may occur simultaneously and vary in predominance over time in a given patient. The observation of the characteristic Wickham striae, especially with the presence of characteristic dermal lesions, usually makes for a straightforward diagnosis. However, a biopsy is recommended since the

characteristic lacy keratotic component of OLP is often lacking and many other disorders may clinically mimic OLP.

Management

There is no cure for OLP, and oral lesions tend to be more persistent and recalcitrant to therapy than concurrent dermal lesions. Strategies are aimed at relieving symptoms and reducing exacerbations and progression. Asymptomatic reticular cases require only routine follow-up for change, while symptomatic cases usually require some form of drug therapy.

Primary line of therapy

For patients with mild to moderately symptomatic OLP, a topical corticosteroid is usually prescribed. Therapy is empiric and the agent chosen depends largely on the lesion presentation, patient preference, and practitioner experience. Ointments or gels work well for localized lesions, whereas elixirs are better suited for more widespread presentations. Ointments may also be mixed with an oral paste such as Orabase to improve adhesion. When effective, improvement should be apparent within 2 weeks. Once improvement is noted, the dosing is titrated down to the lowest dose required to maintain patient comfort. Measures to reduce the predictable risk of developing secondary candidiasis should be undertaken.

Intermediate-potency topical steroid

℞ Triamcinolone acetonide (Kenalog), 0.1% cream

Disp: 15-gram tube

Sig: Apply thin coating to affected areas after meals and at bedtime. Do not eat or drink for 30 minutes.

℞ Betamethasone valerate (Betatrex), 0.1% ointment

Disp: 15-gram tube

Sig: Apply thin coating to affected areas after meals and at bedtime. Do not eat or drink for 30 minutes.

Potent topical steroid

℞ Fluocinonide (Lidex), 0.05% ointment

Disp: 15-gram tube

Sig: Apply thin coating to affected areas after meals and at bedtime. Do not eat or drink for 30 minutes.

℞ Dexamethasone (Decadron) elixir, 0.5 mg/5 mL

Disp: 100 mL

Sig: Rinse with 1 teaspoonful for 2 minutes 4 times a day and spit out.

Ultra-potent topical steroid

℞ Clobetasol propionate (Temovate), 0.05% ointment
Disp: 15-gram tube
Sig: Apply thin coating to affected areas after meals and at bedtime. Do not eat or drink for 30 minutes.

Secondary line of therapy

For moderate to severe OLP or for cases unresponsive to topical corticosteroids, a systemic steroid should be used. Localized lesions may respond favorably to the local injection of an agent such as triamcinolone acetonide. The most commonly used systemic corticosteroid is prednisone. The approach is to prescribe a high-dose (40 to 80 mg/day), short-course (no more than 10 days) regimen to maximize the therapeutic effect while minimizing long-term side effects such as hypothalamic-pituitary-adrenal axis suppression. However, other possible adverse effects such as insomnia, mood swings, nervousness, diarrhea, fluid retention, muscle weakness, and hypertension may occur. Consultation with a physician is recommended before prescribing systemic corticosteroids for patients with hypothyroidism, heart failure, peptic ulcer disease, ulcerative colitis, cirrhosis, and thromboembolic disorders. Patients who respond favorably to a short-course systemic regimen should be placed on a topical agent with the goal of reducing acute exacerbations.

For local injection

℞ Triamcinolone acetonide (Kenalog) suspension, 10 g/mL
Disp: 5 mL
Sig: Inject 0.2 to 0.4 mL into base of lesion.

For systemic oral course

℞ Prednisone (Deltasone), 10-mg tablets
Disp: 60 tablets
Sig: Take 6 tablets as a single dose each morning for 10 days.

Tertiary line of therapy

For patients nonresponsive to the secondary line of therapy or for those who quickly relapse after cessation of short-term steroid therapy, a more aggressive approach is necessary. Long-term corticosteroid regimens with or without additional agents such as immunosuppressants or immunomodulators may be beneficial for such patients; however, the side-effect liability is such that these medications should only be prescribed by or in close collaboration with the patient's physician.

ERYTHEMA MULTIFORME

Erythema multiforme (EM) is the global term applied to a spectrum of acute mucocutaneous vesiculobullous erosive disorders. Typically a self-limiting process, the severity of EM varies from mild (EM minor and oral EM) to moderate (EM major) to potentially fatal (Stevens-Johnson syndrome [SJS] and toxic epidermal

necrolysis [TEN]). The pathophysiology of EM has not been clearly established, although it likely represents a genetically predisposed allergic host response to antigenic challenge. In susceptible patients, an immunologic attack against keratinocytes expressing nonself antigens results in apoptosis and subsequent necrolysis. Most cases of oral EM, EM minor, and EM major are related to an infectious agent, usually the herpes simplex virus. Other organisms implicated include β-hemolytic streptococci, coccidiomycosis, coxsackie virus, diphtheria, Epstein-Barr virus, herpes zoster, influenza type-A, measles, mumps, *Mycoplasma pneumoniae*, and vaccinia. In contrast, most cases of SJS and TEN are related to pharmacologic agents, most frequently sulfonamides, anticonvulsive drugs, and nonsteroidal anti-inflammatory drugs (NSAIDs). In addition, EM has been reported to develop following immunizations or radiotherapy, while other reports associate it with Crohn disease, Addison disease, lupus erythematosus, pregnancy, sarcoidosis, and malignancies such as Hodgkin disease, multiple myeloma, and others. Still, in many cases a causative agent is not identified.

Diagnosis

EM may occur at any age; however, it has its greatest propensity for young adults. The onset of the eruption is rapid (12 to 24 hours) and at times it is associated with fever, symptoms of respiratory tract infection, and muscular aches. Table 5-2 summarizes the spectrum of EM. The typical abrupt onset combined with the presence of characteristic mucocutaneous lesions (i.e., target lesions, vesiculobullous erosive oral lesions, serohemorrhagic crusting of the lips [see Insert, Figures 5-17 and 5-18] makes for a straightforward diagnosis. Historical evidence of prior occurrence and/or exposure to a possible causative drug or infectious agent reinforces the diagnosis.

Management

Most cases of EM are self-limiting with resolution occurring in 1 to 6 weeks. For such cases, treatment is generally palliative and symptomatic. The withdrawal of any suspected causative medications should be undertaken and a careful history obtained to identify any other possible underlying causes.

Primary line of therapy

Topical anesthetic

Anesthetic mouth rinses such as diphenhydramine or viscous lidocaine may be prescribed for oral pain. Such agents may be mixed with Kaopectate or Maalox to improve local retention.

℞ Diphenhydramine (Children's Benadryl) elixir, 12.5 mg/5 mL [OTC]

Disp: 8 ounces

Sig: Rinse with 1 teaspoonful every 2 hours and spit out.

℞ Diphenhydramine (Children's Benadryl) elixir, 12.5 mg/5 mL [OTC] 4 ounces mixed with Kaopectate or Maalox [OTC] 4 ounces (50% mixture by volume)

Disp: 8 ounces

Sig: Rinse with 1 teaspoonful every 2 hours and spit out.

Table 5-2. Spectrum of Erythema Multiforme

Spectrum	Cutaneous Involvement	Mucosal Involvement	Outcome
EM minor	Target lesion, acral distribution, negative Nikolsky sign	Often absent	Recovery; possible recurrence
EM major	As above	Prominent oral involvement; vesiculoerosive erosions with fibrinous pseudomembrane; characteristic hemorrhagic lip involvement	Recovery; possible recurrence; rare mortality
SJS	Widespread small blisters, macules, atypical target lesions predominate on torso; epidermal detachment <10% body surface area; positive Nikolsky sign	As above, possibly more extensive; ocular and genital involvement common	Fatal in 5% to 10% of cases; possible scarring; possible recurrence
TEN	Widespread small blisters, macules, atypical target lesions predominate on torso; epidermal detachment in >30% body surface area; positive Nikolsky sign	As above	Fatal in up to 35% of cases; possible scarring; possible recurrence
Oral EM	Typical target lesions frequently absent	Oral lesions predominate clinical picture	Recovery; possible recurrent and chronic forms

EM, erythema multiforme; SJS, Stevens-Johnson syndrome; TEN, toxic epidermal necrolysis.

Nutritional supplement

Adequate hydration and nutrition are mandatory. Nutritional supplements may be prescribed to ensure the maintenance of adequate nutritional intake.

℞ Ensure Plus [OTC]
Disp: 25 cans
Sig: Three to 5 cans in divided doses throughout the day. Serve cold.

℞ Meritene Food Supplement [OTC]
Disp: 1-pound can (various flavors)
Sig: Three servings daily. Prepare as indicated on label. Serve cold.

Corticosteroids

The use of systemic corticosteroids for the treatment of EM, particularly the more severe forms, remains controversial and has not been validated in clinical trials. Any potential value of corticosteroid therapy is likely predicated on its prompt administration to a patient who presents at the earliest onset of the EM.

℞ Prednisone (Deltasone), 10-mg tablets
Disp: 70 tablets (*for a 70-kg patient*)
Sig: Take 7 tablets by mouth each morning until lesions resolve, and then decrease by 1 tablet each successive day.

Secondary line of therapy

Referral to a physician is warranted for all cases of EM nonresponsive to primary therapy or any suspected case of SJS or TEN. These cases often require a multidiscipline approach to management, in a manner similar to that of a patient with extensive burns.

Prevention

For cases of EM associated with herpes simplex infection, prophylactic antiviral therapy often proves beneficial. For cases of EM attributed to a specific drug, strict avoidance of the suspect drug and all drugs with cross-reactive potential is mandatory to preclude recurrence. For cases in which the cause is unknown, patient education concerning the possibility of recurrence and the necessity to ensure prompt medical intervention is recommended.

For herpes-associated erythema multiforme (HAEM)

℞ Acyclovir (Zovirax), 400-mg capsules
Disp: 90 capsules
Sig: Take 1 tablet 3 times daily until all tablets are taken.

℞ Valacyclovir (Valtrex), 500-mg capsules
Disp: 30 capsules
Sig: Take 1 capsule daily until all capsules are taken.

CICATRICIAL PEMPHIGOID

Cicatricial pemphigoid (CP), also known as mucous membrane pemphigoid, is a rare chronic mucocutaneous bullous condition. It is a heterogeneous autoimmune disease, characterized by the production of autoantibodies against basement membrane zone (BMZ) antigens. The mean age of onset of CP is 62 years and it appears to have a 2:1 predilection for women, without racial or geographic bias.

Diagnosis

The most common sites affected by CP are the oral tissues, conjunctiva, and skin. These are followed in prevalence by genital, pharyngeal, laryngeal, nasal, and esophageal involvement. Oral CP is most commonly found on the buccal and labial aspects of the attached gingiva, followed by the buccal or labial mucosa, palate, tongue, and pharynx (see Insert, Figures 5-19 and 5-20). Gingival lesions may be characterized as desquamative (positive Nikolsky sign), erythematous, painful, and, at times, hemorrhagic. The primary oral mucosal lesions of CP are vesiculobullous and tend to rupture within hours, resulting in painful erosions or ulcerations with smooth borders. Although oral mucosal lesions usually heal slowly without scarring, scarring as a result of submucosal fibrosis is a key feature of disease progression in other sites such as the conjunctiva and larynx.

The diagnosis is confirmed by histologic, immunopathologic, and serologic studies. Histologic specimens are often nonspecific, but typically demonstrate subepithelial blistering and the presence of a dense submucosal inflammatory infiltrate. Direct immunofluorescence of perilesional tissue reveals a characteristic linear deposition of immunoglobulin G (IgG) and complement 3 (C3) along the BMZ. Indirect immunofluorescence using salt-split skin as the substrate may demonstrate several anti-BMZ antibodies associated with CP.

Management

The extent of the dentist's involvement in managing CP depends on the presentation. For cases of CP restricted to the oral cavity, the dentist should be prepared to deliver initial therapeutic interventions. However, cases of CP manifesting extraoral involvement require a multidisciplinary approach to therapy, usually coordinated by a dermatologist. In all cases, the dentist should be familiar with immunopharmacologic strategies intended to minimize morbidity or induce remission; participate in monitoring the patient's response to therapy; and anticipate, recognize, and report treatment-related adverse drug events to the primary caregiver.

Primary line of therapy

For mild cases of CP limited to the oral cavity, a regularly applied topical high-potency or ultra-potency corticosteroid ointment or gel may be all that is necessary to successfully manage the patient. Ointments may also be mixed with an oral paste such as Orabase to improve adhesion. For lesions restricted to the gingiva, custom trays may be fabricated to improve the delivery of ste-

roids to the affected tissues. The frequency of application should be titrated down to the minimum required to maintain lesion control and patient comfort. Measures to reduce the predictable risk of developing secondary candidiasis should be undertaken. In addition, the patient should be educated to reduce the risk of trauma and to maintain excellent oral hygiene. All teeth and restorations should be smooth and free of jagged edges.

Potent topical steroid

℞ Fluocinonide (Lidex), 0.05% ointment

Disp: 15-gram tube

Sig: Apply a thin layer to affected areas after each meal and at bedtime. Do not eat or drink for 30 minutes.

Ultra-potent topical steroid

℞ Clobetasol propionate (Temovate), 0.05% ointment

Disp: 15-gram tube

Sig: Apply a thin coating to affected areas after meals and at bedtime. Do not eat or drink for 30 minutes.

Secondary line of therapy

In the management of recalcitrant cases, a regimen of dapsone may be added to the first line of therapy. Dapsone, a sulfone antimicrobial agent, is a competitive antagonist of para-aminobenzoic acid (PABA) and prevents the normal use of PABA in the synthesis of folic acid. It also inhibits the chemotaxis of polymorphonuclear leukocytes, reduces their accumulation in the upper dermis, and directly diminishes tissue inflammation. Dapsone is associated with several potentially serious side effects such as headache, hemolytic anemia, methemoglobinemia, bone marrow suppression, and liver toxicity. Its use is contraindicated in patients with glucose-6-phosphate dehydrogenase deficiency. The complete blood count, with white cell differential, should be established at baseline and monitored every 2 weeks during therapy. The development of agranulocytosis warrants immediate drug cessation and prompt medical evaluation. To reduce the side-effect risk, a small initial dose is prescribed with future doses gradually tapered up to reach therapeutic levels. Once control is obtained, the dosage is gradually reduced to the minimum required for maintenance. Partial or complete remission may be observed after 2 to 12 weeks of treatment with 75 to 150 mg of dapsone daily.

℞ Dapsone, 25-mg tablets

Disp: 60 tablets

Sig: Take 1 tablet once a day for 3 days, then take 2 tablets once a day for 3 days, then take 3 tablets once a day for 3 days, then take 4 tablets once a day for 3 days, then take 6 tablets once a day.

Tertiary line of therapy

For cases of oral CP not controlled by topical steroids and dapsone and for cases of CP manifesting extraoral involvement, more aggressive therapeutic

measures are prescribed. Initially, a regimen of long-term systemic corticosteroid and dapsone may induce disease remission. However, severe nonresponsive cases of CP often require still more aggressive immunosuppressive therapies with agents such as azathioprine, methotrexate, mycophenolate mofetil, cyclophosphamide, tacrolimus, or mitomycin C. The side-effect liability of all tertiary lines of therapy is such that they should only be prescribed by or in close collaboration with the patient's physician.

PERICORONITIS

Pericoronitis, seen most commonly in young adults, is a localized gingivitis associated with a partially erupted tooth. While it may be associated with any deciduous or succedaneous tooth, it most often affects the permanent third molars. Bacterial plaque and food debris accumulate beneath the operculum, providing an ideal milieu for rapid bacterial growth. The ensuing bacterial infection consists of a predominately anaerobic flora mainly consisting of α-hemolytic streptococci, *Veillonella*, *Prevotella*, *Bacteroides*, *Capnocytophaga*, *Campylobacter*, and *Actinomyces*. Contributing factors include lowered systemic resistance, decreased flow of saliva, poor eating habits, lack of sleep, and inadequate oral hygiene.

Diagnosis

The diagnosis of pericoronitis is usually straightforward. Mild or early cases present with pain or discomfort associated with gingival inflammation around the offending tooth. Frequently, occlusal trauma from an opposing, often supraerupted tooth acts to aggravate or occasionally initiate the process. Palpation of inflamed gingival tissue will usually elicit a purulent exudate. More advanced cases may manifest malaise; fever; lymphadenopathy; foul taste; pain in the ear, throat, and floor of the mouth; peritonsillar and pharyngeal inflammation; cellulitis; and loss of masticatory function. Severe cases may involve the buccal, submental, submandibular, vestibular, and pterygoid spaces. Rarely, cases caused by virulent pathogens may spread rapidly to the brain, throat, and mediastinum.

Management

The extent of treatment depends on the severity of pericoronitis, the presence of systemic complications, and the feasibility of retaining the involved tooth.

Primary line of therapy

Mild cases of pericoronitis usually respond promptly to therapies that establish drainage, remove sources of trauma, improve oral hygiene, and relieve pain. Drainage can often be established by simply inserting a periodontal probe under the operculum. The area should be thoroughly irrigated with saline or an antiseptic rinse such as 0.8% povidone iodine, 3% hydrogen peroxide diluted to half-strength with saline, or 0.12% chlorhexidine gluconate. A wick of iodoform gauze may be temporarily inserted under the operculum to allow for continuous drainage. The patient is further instructed to rinse with warm salt water for 2 minutes every waking hour.

For cases in which the opposing tooth is traumatizing the operculum, the opposing tooth should either be extracted or undergo an odontoplasty to reduce the traumatic insult. Patients should be advised to rest; avoid drinking alcoholic beverages and smoking cigarettes; maintain hydration; and eat a

soft, balanced diet. The importance of oral hygiene must be stressed and its relationship to pericoronitis discussed. For patients with mild-to-moderate pain, an NSAID or an opioid combination may be prescribed.

℞ Ibuprofen (Motrin), 400-mg tablets
Disp: 20 tablets
Sig: Take 1 tablet every 4 to 6 hours.

Secondary line of therapy

For patients manifesting systemic signs of infection (fever, lymphadenopathy, and malaise), an antimicrobial regimen should be prescribed and added to the aforementioned primary therapeutic measures. Penicillin remains the initial drug of choice; however, there is growing concern that the use of a β-lactam antibiotic may select for β-lactamase-producing bacteria, resulting in clinical failure. For such cases or for patients unable to take penicillin, metronidazole is a better choice.

℞ Penicillin VK, 500-mg tablets
Disp: 20 tablets
Sig: Take 2 tablets stat then 1 tablet 4 times a day until all tablets are taken.

℞ Metronidazole (Flagyl), 500-mg tablets
Disp: 20 tablets
Sig: Take 1 tablet 4 times a day until all tablets are taken.

Tertiary line of therapy

Any patient nonresponsive to conservative therapy or who initially presents with severe signs of infection, such as severe trismus, cellulitis, dehydration, or pending respiratory embarrassment, should be immediately referred to an oral and maxillofacial surgeon or an emergency care facility.

Prevention (extraction of offending tooth)

Many cases of pericoronitis may be prevented by the timely extraction of teeth that are either malposed or have insufficient room to fully erupt. The extraction of third molars in the presence of pericoronitis is controversial. Some experts caution that extracting teeth in the presence of pericoronitis increases the risk of developing septicemia, cavernous sinus thrombosis, or mediastinal abscess. They recommend extraction of the offending tooth once the pericoronitis has been appropriately managed.

ALVEOLAR OSTEITIS

Alveolar osteitis (AO), or dry socket, is a relatively common postextraction complication that affects mandibular third-molar sites 10 times more frequently than other sites. It is postulated that surgical trauma or the presence of existing

inflammation leads to the release of bioactive substances from the alveolar bone or adjacent tissues that convert plasminogen in the clot to the fibrinolytic agent plasmin. Plasmin acts to dissolve the clot, which leads to the release of kinins. Numerous predisposing factors have been associated with AO including smoking, contraception use, gender, surgical trauma, preexisting infections, inadequate infection control, increased patient age, and insufficient irrigation during surgery. AO is a transient phenomenon that will resolve itself in about 7 to 10 days, albeit with significant discomfort.

Diagnosis

The diagnosis of AO is usually easily made and is based on the presence of an empty extraction site 2 to 3 days postprocedure, severe pain in and around the extraction site that often radiates, and halitosis. AO is unlikely to occur within the first 24 hours postextraction. Occasionally, fever, trismus, and lymphadenopathy may be present, but such findings may also indicate the presence of infection. Other conditions to consider in the differential include retained tooth or boney fragments, foreign debris, or fracture.

Management

Unfortunately, no universally accepted or validated protocols exist to prevent or manage AO. Indeed, some protocols that have been shown to prolong and/or worsen AO continue to be practiced by some clinicians. Almost all proposed protocols incur additional office visits, substantial extra costs, and may induce an adverse reaction. If an adverse reaction were to occur, defending the use of an unproven product may prove difficult. However, in spite of all the apparent contradictions in the literature, some prudent recommendations can be offered.

Prevention

Prudent measures to prevent AO should be undertaken for all patients undergoing an extraction. Whenever possible, plaque levels and associated inflammation should be reduced. For patients taking oral contraceptives, the surgery should be scheduled during days 23 to 28 of the menstrual cycle. A chlorhexidine rinse should be administered immediately before surgery and for 1 week postoperatively. An atraumatic surgical technique should be used with attention to irrigate the extraction site with saline, ensure the removal of any bone or tooth fragments, and verify the formation of a viable clot. Verbal and written postoperative instructions should be provided to emphasize the need to avoid smoking, sucking through a straw, drinking carbonated beverages, and vigorous rinsing for 48 hours. A nutritious soft diet is recommended and the use of gentle toothbrushing for oral hygiene should be prescribed.

℞ Chlorhexidine gluconate (Peridex, PerioGard, others) rinse, 0.12%

Disp: 16-ounce bottle

Sig: Rinse with 0.5 ounce for 1 minute immediately before surgery, followed by 0.5-ounce gentle rinse for 1 minute, twice a day, for 1 week after surgery.

Treatment

The goal in treating AO is to reduce discomfort and promote healing. Currently, there are no products available that truly meet both these goals. Conservative therapy consists of the following:

1. Remove any sutures to allow easy access to extraction site; local anesthesia is often required for this.
2. Thoroughly irrigate the site with warm saline to loosen any debris and carefully suction the site.
3. There is no need to curette the site to incur bleeding (once AO occurs, healing will occur through secondary intention).
4. Provide and instruct the patient on the appropriate use of a curved-tip plastic syringe to keep the socket site clean by irrigating with either chlorhexidine gluconate or saline.
5. Prescribe an analgesic; reassure and educate the patient on the process and the therapeutic goals.

For pain relief

> Rx
> Hydrocodone 7.5-mg and ibuprofen 200-mg tablets (Vicoprofen)
> *Disp*: 20 tablets
> *Sig*: Take 1 to 2 tablets every 4 to 6 hours as needed.

STOMATITIS

Stomatitis is an encompassing term used to refer to any inflammatory condition affecting the mucosal tissues of the mouth. As such, many of the conditions addressed in this chapter qualify as forms of stomatitis. The degree of mucosal involvement in stomatitis varies greatly, depending on the predisposing and etiologic factors involved. Typically, stomatitis is associated with mild-to-moderate pain and a potential for secondary bacterial and fungal infections.

Diagnosis

The diagnosis of stomatitis is usually easily made based on the patient's presenting complaint and findings of the clinical examination. However, a careful and thorough discernment of the patient's history is often required to identify any and all possible etiologies.

Chemical, thermal, and physical trauma

These lesions present as white or raw bleeding, painful, desquamative (sloughing) areas. Common examples include aspirin (see Insert, Figure 5-21) and pizza burns. The heat and chemical irritants produced by excessive smoking cause erythema of the hard palate, which progresses to a grayish-white, thickened papular appearance with small red spots representing the dilated orifices of minor salivary glands. Inadvertent gasoline exposure, which may occur with siphoning, may induce mucosal swelling and a vesiculobullous eruption. Ill-fitting removable dental prostheses may traumatize the oral mucosa, producing erythema, erosion, and ulceration. Dental prostheses that are improperly worn and/or inadequately maintained may predispose to the development of candidiasis. Finally, numerous medications including gold salts and NSAIDs have the potential to produce mucosal damage, which may range from superficial erosions to pronounced ulcerations covered with fibrin and at times surrounded by an erythematous halo.

Chemotherapy- and radiation-induced stomatitis

Perhaps the most dramatic form of stomatitis is seen in association with chemotherapy and head and neck radiotherapy (see Insert, Figures 5-22 and 5-23), since the therapeutic value of both of these modalities lies in their ability to interfere with cell replication. Chemotherapeutic agents used to eradicate malignant cells may also destroy certain normal cells, resulting in generalized mucositis. Similarly, any form of radiation has the potential to directly or indirectly interact with critical targets in the cells and initiate a chain of events that lead to tissue damage when absorbed in biological material. When the oral cavity is in the field of radiation, the rapidly dividing cells of the oral mucosa may be affected. The resultant large ulcerative lesions may make it difficult for patients to maintain an adequate nutritional intake and serve as portals for serious disseminated infection.

Management

Depending on the etiology and severity, the management strategies to address stomatitis will vary. For many cases, simple recognition along with patient education and reassurance is all that is necessary. For others, more aggressive therapies may be required.

Primary line of therapy

Small isolated lesions such as burns or traumatic ulcerations frequently require no specific therapy. There are numerous prescription and OTC topical gels, creams, ointments, and rinses marketed for the treatment of mouth sores (see the section on recurrent aphthous stomatitis, p. 93); however, clinicians are reminded that no validated studies exist to demonstrate the clinical superiority of any formulation over another. For cases of stomatitis thought to be caused by a medication, the patient should be advised to cease using the medication if self-prescribed. For cases possibly caused by a prescription medication, a medical consultation with the physician is warranted to consider the use of an alternative agent.

Secondary line of therapy

For more severe cases, such as may occur with radiation therapy and/or chemotherapy, strategies to provide palliation and prevent secondary infection are indicated. Patients should be instructed to carefully remove plaque either with a soft toothbrush or with a foam toothette to minimize trauma; to avoid products irritating to oral soft tissues (such as alcohol and tobacco; hot, spicy, and coarse foods; and fruits and beverages with a high acid content); to refrain from wearing removable prostheses; to eat a dental soft diet; and to frequently rinse with alkaline saline (sodium bicarbonate) solution. A topical anesthetic agent such as lidocaine viscous or diphenhydramine hydrochloride and, if necessary, a systemic analgesic may be prescribed. When topical anesthetics are used, the patient should be warned that these agents may increase the risk of self-induced trauma, may interfere with the pharyngeal phase of swallowing, and may lead to aspiration.

℞ Alkaline saline mouth rinse

Disp: Mix 0.5 teaspoon each of salt and baking soda in 16 ounces of water

Sig: Gently rinse with copious amounts 4 times a day.

℞ Diphenhydramine (Children's Benadryl) elixir, 12.5 mg/5 mL [OTC]

Disp: 8 ounces

Sig: Rinse with 1 teaspoonful every 2 hours and spit out.

℞ Diphenhydramine (Children's Benadryl) elixir 12.5 mg/5 mL [OTC] 4 ounces mixed with Kaopectate or Maalox [OTC] 4 ounces (50% mixture by volume)

Disp: 8 ounces

Sig: Rinse with 1 teaspoonful every 2 hours and spit out.

℞ Lidocaine (Xylocaine) viscous, 2%

Disp: 100 mL

Sig: Rinse with 1 teaspoonful for 1 minute, then expectorate, before meals and at bedtime.

Patient education

Misguided individuals must be advised that the topical application of medicaments such as aspirin that are compounded for systemic use is ill-advised. The adverse mucosal effects caused by tobacco use afford the practitioner a tangible opportunity to discuss and promote tobacco cessation. Oral lesions associated with the accidental mucosal exposure to gasoline and other chemicals generally are not severe, although they may require supportive treatment, and complete healing usually occurs within 7 days. The treatment of stomatitis caused by ill-fitting or poorly maintained removable dental prostheses may require only minor denture adjustment or cleaning, or complete refabrication of the prostheses. Patients should be educated on the need to not wear the prostheses 24 hours per day. The importance of meticulous oral hygiene cannot be overemphasized as an effective preventive and therapeutic modality in the management of stomatitis.

BURNING MOUTH DISORDER

Burning mouth disorder (BMD) is a chronic, painful condition that manifests as a burning sensation affecting the oral mucosa, particularly the mucosa of the anterior tongue and lips. When limited to the tongue, BMD is often referred to as glossodynia. The etiology of BMD is unknown, but there is a predilection to afflict women (6:1).

Diagnosis

An estimated 50% of cases are associated with oral dryness and dysgeusia. The clinical examination is usually unremarkable for obvious abnormalities, causing frustration for both the patient and the clinician. Numerous conditions, such as hormonal changes in women (especially in the perimenopausal or postmenopausal periods); stomatitis areata migrans; iron, folic acid, or B_{12} deficiency; diabetes mellitus–associated neuropathy; candidiasis; and neurotic glossodynia may cause burning sensations of the oral mucosa. Appropriate

medical consultations may be necessary to rule out suspected comorbid factors before establishing a diagnosis of BMD.

In iron deficiency anemia, the patient's tongue may exhibit pallor and a loss of filiform papillae. Early manifestations are noted on the lateral margins and tip of the tongue. A deficiency of folic acid or vitamin B_{12} may cause a generalized atrophy of the lingual papillae. These patients may present with a painful, beefy-red tongue, often accompanied by angular cheilitis. Diabetic neuropathy may manifest as a burning sensation in the mouth. In addition, patients with poor glycemic control and others who are at high risk of candidiasis (see the section on candidiasis, p. 87) and xerostomia (see the section on xerostomia, p. 89), and those with OLP (see section on oral lichen planus, p. 95), may also experience similar symptoms.

Stomatitis areata migrans is a commonly encountered condition that usually affects the tongue. Characteristic findings are a loss of the filiform papillae, which occurs in an irregular pattern and migrates over time. This condition is usually asymptomatic, although some patients may complain of a burning sensation, especially when eating spicy foods.

Finally, neurotic glossodynia has been described in postmenopausal women and is often accompanied by cancerphobia. A presenting complaint of glossodynia, with no evidence of clinical lesions, may be the first indication of depression. Patients suffering from a stress disorder may complain of glossodynia, metallic taste, or pruritus (often of the scalp).

Management

The treatment of burning mucosal sensation associated with an identifiable cause is treated primarily by managing the underlying cause. BMD, being a diagnosis of exclusion, is managed with neuroleptic agents. Such medications should be prescribed in close collaboration with the patient's physician. The recommendations that follow are provided for completeness with the acknowledgment that many general practitioners will choose to refer such off-label therapies to the patient's physician.

Primary line of therapy

Clonazepam taken at bedtime may be effective in relieving BMD. The initial dose is low and slowly titrated up every 3 to 7 days until a therapeutic effect is observed or the maximum recommended dose is attained. For clonazepam, the maximum daily dose is 4 mg. Alternatively, a benzodiazepine such as chlordiazepoxide may be prescribed.

℞ Clonazepam (Klonopin), 0.5-mg tablets

Disp: 100 tablets

Sig: Take 1 tablet at bedtime. Increase daily dosage by 0.5 mg after every 3 days until improvement is noted.

℞ Chlordiazepoxide (Librium), 5-mg tablets

Disp: 50 tablets

Sig: Take 1 to 2 tablets 3 times a day.

Secondary line of therapy

For patients nonresponsive to primary therapies, the use of a tricyclic antidepressant such as desipramine may prove effective. Desipramine is preferred

over amitriptyline because it induces less oral drying. The initial dose of 10 mg is increased by 10 mg weekly until therapeutic relief is attained. The maximum allowable daily dose is 50 mg.

℞ Desipramine (Norpramin), 10-mg tablets

Disp: 50 tablets

Sig: Take 1 tablet at bedtime. Increase dose by 10 mg each week until therapeutic relief attained. Do not exceed 50 mg per day.

Tertiary line of therapy

For patients refractory to the above therapies, the use of the anticonvulsant gabapentin may be effective. Gabapentin is approved for the treatment of postherpetic neuralgia. The initial dose of 300 mg a day is steadily increased to 300 to 600 mg three times a day until relief is attained. Doses in excess of 1,800 mg per day generally show no increase in therapeutic effect.

℞ Gabapentin (Neurontin), 300-mg capsules

Disp: 50

Sig: Take 1 tablet on the first day, increase to 1 tablet twice a day on the second day and then 1 tablet 3 times a day.

NECROTIZING ULCERATIVE GINGIVITIS

Necrotizing ulcerative gingivitis (NUG) is a unique, painful bacterial infection affecting the interdental and marginal gingival tissue. Consistently implicated microorganisms include *Prevotella intermedia, Fusobacterium fusiforme, Bacteroides melaninogenicus, Treponema,* and *Selenomonas*. The positive clinical response to antibiotics tends to support the role of these organisms as etiologic agents. Although bacteria underlie the etiology, NUG is not considered to be a communicable disease. There seems to be a direct relationship between the occurrence of NUG and reduced host resistance. Other established predisposing factors include malnutrition, tobacco smoking, psychological stress, preexisting gingivitis, and trauma. In some cases, particularly in those with an immunosuppressive disorder, NUG may progress to affect the deeper periodontal ligament and osseous tissues, resulting in necrotizing ulcerative periodontitis (NUP).

Diagnosis

The diagnosis of NUG is usually readily made based on the characteristic clinical findings. Essential findings include the unique punched-out crater-like ulcerations affecting the interdental and marginal gingiva, spontaneous gingival hemorrhage, and pain (see Insert, Figure 5-24). Other potential findings include fetor oris, the presence of a grayish-yellow pseudomembrane consisting of necrotic debris and bacteria, fever, malaise, and lymphadenopathy. Lymphadenopathy most frequently involves the submandibular nodes and to lesser degree the cervical nodes. Clinical findings suggestive of NUP include deep interproximal craterlike defects and denudation or sequestration of alveolar bone. However, such dramatic findings may also be observed with NUG affecting a patient with attachment loss associated with preexisting periodontal disease.

Management

Primary line of therapy

Reinforcement of personal plaque control combined with professional debridement is undertaken to reduce the bacterial mass. Patients should be instructed on how to gently brush their teeth with a soft-bristle toothbrush. While ultrasonic instrumentation with copious amounts of water represents an excellent choice for debridement, judicious and gentle hand scaling with copious irrigation will also suffice. The goal is to perform a simple debridement, not a thorough fine scale. In addition, the patient is instructed to rinse with a 3% hydrogen peroxide solution, diluted one-half to one-fourth strength, or with chlorhexidine gluconate. Patients should be advised to rest, avoid smoking cigarettes and drinking alcoholic beverages, eat a soft nutritious diet, and maintain adequate hydration. Prompt clinical improvement is the rule and the patient should be seen daily until the acute phase is eliminated.

℞ Hydrogen peroxide, 3% rinse [OTC] (4 ounces of rinse mixed with 12 ounces of water)

Disp: 16 ounces

Sig: Rinse with 1 to 2 tablespoons 4 times daily and expectorate.

℞ Chlorhexidine gluconate (Peridex, PerioGard), 0.12%

Disp: 16-ounce bottle

Sig: Rinse with 0.5 ounce twice daily for 30 seconds and expectorate. Avoid rinsing or eating for 30 minutes after use.

Secondary line of therapy

The use of a systemic antimicrobial regimen should be considered for the patient who does not promptly respond to the primary line of therapy, who initially presents with constitutional signs such as lymphadenopathy and/or fever, or who initially manifests NUP. Either penicillin or metronidazole may be used and improvement should be prompt.

℞ Penicillin V potassium (Veetids), 500-mg tablets

Disp: 40 tablets

Sig: Take 1 tablet by mouth 4 times a day until all tablets are taken.

℞ Metronidazole (Flagyl), 500-mg tablets

Disp: 28 tablets

Sig: Take 1 tablet every 6 hours.

Follow-up

Close follow-up is mandatory to verify adequate resolution of NUG. Nonresponsive patients should undergo further medical evaluation to rule out condi-

tions such as leukemia, severe malnutrition, or HIV infection. A high degree of suspicion for the presence of an underlying immunosuppressive disorder is warranted for the patient who initially presents with NUP. For all patients, additional interventions may be necessary to address any residual soft tissue deformities.

CONCLUSION

The clinical manifestations of many diseases, either local or systemic, typically appear on certain areas of the face, lips, labial or buccal mucosa, palate and tonsillar areas, tongue, floor of the mouth, or gingivae. Knowledge of the more common sites of involvement of a disease assists in its diagnosis. It must be remembered, however, that no diagnostic index or outline can take into consideration the capriciousness of a disease or the different reactions of an individual host to a disease. Therefore, the evaluation and integration of the clinical appearance and characteristics of a lesion with its history of development and other appropriate diagnostic findings should always determine the final diagnosis and therapeutic approach.

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INTRODUCTION

Today's clinicians treat more medically and pharmacologically compromised patients than ever before. The availability of more than a thousand active ingredients in several thousand different formulations and over 100,000 nonprescription medications, and hundreds of facts about each of them, presents a seemingly insurmountable challenge in mastering the essentials for the clinical decision-making process. Fortunately, the clinician who understands general pharmacological principles can learn to predict the behavior of each drug based on a few facts. It is better to develop a drug profile than to memorize isolated data. The best way to achieve this objective is to associate, envision, predict, and inquire. Associate each drug with information already known. Envision the course of events that would occur as a drug enters the patient's body. Predict clinical uses and adverse drug events based on the drug's mechanism of action. Inquire which fact about a drug is going to have an impact on the clinical decision-making process in dentistry. This section is based on the top 200 drugs dispensed by U.S. community pharmacies. The list is published annually. An awareness of the various medications commonly prescribed for patients will help clinicians anticipate the most commonly encountered medical diagnoses. The information will assist clinicians in identifying high-risk patients and guiding them in the development of appropriate diagnostic, preventive, and therapeutic strategies in the oral health care setting.

THE PATIENT TAKING CARDIOVASCULAR DRUGS

The heart pumps blood through a system of blood vessels under the control of an electric conduction system to deliver oxygen to all cells of the body. When the blood volume becomes greater than the limited volume capacity of the vascular system, the patient develops hypertension. When the myocardium does not get enough oxygen because of coronary artery disease, the patient will experience angina pectoris. If oxygen deprivation to a portion of the myocardium persists, the patient may develop myocardial infarction. When the conduction system malfunctions, arrhythmias occur. When the heart is unable to pump enough blood to meet the metabolic demands of the body for oxygen, the patient is said to have developed heart failure. In addition, many of these conditions can lead to thromboembolic complications.

Diuretics

furosemide

hydrochlorothiazide

triamterene w/hydrochlorothiazide

Mechanisms of action

- Hydrochlorothiazide and furosemide inhibit sodium reabsorption and increase the excretion of water and potassium.
- Triamterene inhibits sodium reabsorption and increases the excretion of water, but has a potassium-sparing effect.

Clinical indications

- Hypertension
- Edema (congestive heart failure, hepatic failure, renal failure)

Electrolyte modifiers

potassium chloride

Klor-Con 10 (potassium chloride)

Klor-Con M20 (potassium chloride)

Mechanisms of action

- Promote normal impulse generation in the brain and heart.
- Maintain normal renal function, acid-base balance, carbohydrate metabolism, and gastric acid secretion.

Clinical indications

- Prevention and treatment of potassium deficiency, usually secondary to diuretic therapy

Beta$_1$-adrenergic receptor agonists

atenolol

Coreg (carvedilol)

metoprolol

Toprol XL (metoprolol)

Mechanisms of action

- Competitively block beta$_1$-adrenergic receptors and decrease heart rate and cardiac output.

Clinical indications

- Hypertension
- Angina pectoris
- Tachyarrhythmias

Angiotensin-converting enzyme (ACE) inhibitors and angiotensin (AT) II-receptor antagonists

ACE inhibitors	AT II-receptor antagonists
Altace (ramipril)	Avapro (irbesartan)
enalapril malate	Benicar (olmesartan medoxomil)
lisinopril	Benicar HCT (olmesartan medoxomil w/hydrochlorothiazide)
lisinopril w/hydrochlorothiazide	Cozaar (losartan)
Lotrel (amlodipine w/benazepril)	Diovan (valsartan)
	Diovan HCT (valsartan w/ hydrochlorothiazide
	Hyzaar (losartan w/ hydrochlorothiazide)

Mechanisms of action

- ACE inhibitors prevent the conversion of angiotensin I to angiotensin II and produce vasodilation, suppress aldosterone synthesis, and potentiate the vasodilation effects of bradykinin and prostaglandins.
- The AT II-receptor antagonists block angiotensin II from interacting with its receptor site.

Clinical indications

- Hypertension
- Congestive heart failure

Calcium-channel blocking agents

amlodipine

amlodipine w/benazepril

Cartia XT (diltiazem)

Lotrel (amlodipine w/benazepril)

Norvasc (amlodipine)

verapamil SR

Mechanisms of action

- Calcium-channel blocking agents inhibit calcium ions from entering the "slow" channels (voltage-sensitive areas) of vascular smooth muscle and myocardium.
  - Increase myocardial oxygen delivery, slow conduction velocity, and cause peripheral vasodilation.

Clinical indications

- Angina pectoris
- Supraventricular tachycardia
- Hypertension

VASODILATORS

clonidine

Mechanisms of action

- Clonidine, an alpha$_2$-adrenergic receptor agonist, reduces sympathetic outflow from the central nervous system.

Clinical indications

- Hypertension

LIPID-LOWERING AGENTS

HMG-CoA (3-hydroxy-3-methylglutaryl coenzyme A) reductase inhibitors

Crestor (rosuvastatin sodium)

Lipitor (atorvastatin)

lovastatin

simvastatin

Zocor (simvastatin)

Others

Niaspan (niacin)

Tricor (fenofibrate)

Vytorin (ezetimibe and simvastatin)

Zetia (ezetimibe)

Mechanisms of action

- The "statins" competitively inhibit HMG-CoA reductase, a rate-limiting enzyme in the synthesis of very low-density lipoprotein (VLDL) and low-density lipoprotein (LDL).
- Niacin promotes lipid metabolism thus reducing total cholesterol, LDL, and triglyceride levels while increasing HDL.
- Fenofibrate enhances the synthesis of lipoprotein lipase increasing the catabolism of triglycerides and VLDL.
- Ezetimibe inhibits the absorption of cholesterol from the small intestine, reducing LDL and triglyceride levels.

ANTIANGINAL AGENTS

isosorbide mononitrate

Mechanisms of action

- Isosorbide mononitrate dilates coronary arteries, improves collateral flow to ischemic regions, and decreases left ventricular pressure and systemic resistance.

Clinical indications

- Angina pectoris

CARDIAC GLYCOSIDES

Digitek (digoxin)

Mechanisms of action

- Inhibits the sodium/potassium ATPase pump, which promotes intracellular sodium-calcium exchange.
  - Increased intracellular calcium ion concentration leads to increased cardiac contractility (positive inotropic effect).
- Decreases AV node conduction.

Clinical indications

- Congestive heart failure
- To slow ventricular tachyarrhythmia associated with supraventricular tachycardia (atrial fibrillation, atrial flutter)

ANTITHROMBOTIC AGENTS

Plavix (clopidogrel)

Mechanisms of action

- Clopidogrel blocks adenosine diphosphate (ADP)-dependent platelet aggregation.

Clinical indications

- To reduce thromboembolic events in susceptible patients

ORAL ANTICOAGULANTS

warfarin sodium

Mechanisms of action

- Warfarin interferes with the hepatic synthesis of vitamin K–dependent coagulation factors II, VII, IX, and X.

Clinical indications

- Venous thrombosis and pulmonary embolism
- Embolization with atrial fibrillation
- Coronary occlusion
- Thrombus formation and embolization with prosthetic heart valves

PRINCIPLES OF DENTAL MANAGEMENT

When treating a patient taking cardiovascular drugs, the goals are to develop and implement timely preventive and therapeutic strategies compatible with the patient's physical and emotional ability to undergo and respond to dental care and with the patient's social and psychological needs.

Medical history

An initial medical history must be obtained from all patients, and it should be updated at each appointment, to confirm or to rule out predictors of increased cardiovascular risk in association with noncardiac procedures:

- Minor predictors of increased cardiovascular risk
  - Advanced age, atrial fibrillation, low functional capacity, history of stroke, and uncontrolled systemic hypertension.
- Intermediate predictors of increased cardiovascular risk
  - Stable angina pectoris, previous myocardial infarction, compensated heart failure, diabetes mellitus, and renal insufficiency.
- Major predictors of increased cardiovascular risk
  - Recent myocardial infarction, unstable angina, decompensated heart failure, severe valvular disease, and significant cardiac arrhythmias.

Functional capacity. The history should also seek to determine the patient's functional capacity, an individual's ability to perform a spectrum of common daily tasks, which is expressed in terms of metabolic equivalents (METs). Cardiac risks in association with noncardiac procedures are increased in patients unable to meet a 4-MET demand (climb a flight of stairs, walk uphill, walk on level ground at 6.4 km/hr, or run a short distance).

Vital signs

Blood pressure. Blood pressure provides a useful clue that will either confirm or rule out significant cardiovascular disease. Although blood pressure lower than 180/110 mm Hg is not an independent predictor of cardiovascular risk in association with noncardiac procedures, it serves as a useful marker for coronary artery disease and myocardial ischemia, and correlates with cardiac morbidity. Blood pressure lower than 90/50 mm Hg or higher than 180/110 mm Hg should be considered a medical emergency.

Pulse pressure, rate, and rhythm. The pulse pressure correlates closely with systolic blood pressure and is a reliable cofactor that will provide further evidence to either confirm or rule out significant cardiovascular disease. Pulse rate less than 50 or greater than 120 beats per minute (bpm) should be considered a medical emergency. In addition, premature ventricular contractions, characterized by a pronounced pause in an otherwise normal rhythm, in patients with cardiovascular diseases are significant findings.

Treatment strategies

Treatment strategies for patients with cardiovascular diseases take into consideration the patient's overall health as reflected by the patient's medical history and vital signs (Table 6-1). In medicine, a stepwise approach to the assessment of cardiac risk (combined incidence of nonfatal myocardial infarction, heart failure, and sudden cardiac death) for various noncardiac medical surgical procedures confirmed that different procedures are associated with different cardiac risks. Cardiac risk most often reflects such procedure-specific variables as fluid shifts, blood loss, duration of a procedure, and associated physiological and psychological stress. There are no adequately controlled or randomized clinical trials that help define cardiac risk for various dental procedures. However, there is evidence to suggest that dental procedures, in general, are low or very low cardiac-risk procedures.

Local anesthesia. The physiological events associated with the "stress" of a procedure and the administration of anesthetic agents can affect cardiac function. When treating patients with cardiovascular diseases, local anesthesia

Table 6-1. Treatment Protocols for the Dental Management of Patients With Cardiovascular Disease

Predictors of Cardiovascular Risk	Physical Examination	Treatment Options	Consultations/Referrals
Intermediate or minor	• Blood pressure < 180/110 mm Hg • Normal pulse pressure, rate, and rhythm • Functional capacity > 4 METs	Comprehensive care	Routine referral to a physician for medical management and risk factor modification.
	• Blood pressure < 180/110 mm Hg • Normal pulse pressure, rate, and rhythm • Functional capacity < 4 METs	Limited care	
	• Blood pressure > 180/110 mm Hg *and/or* • Abnormal pulse pressure, rate, or rhythm	Emergency care	If patient is asymptomatic, routine referral to a physician for medical management and risk factor modification. If patient is symptomatic, immediate referral to a physician for medical management and risk factor modification.
Major	• Establish baseline vital signs	Emergency care	Immediate referral to a physician for medical management and risk factor modification.

METs, metabolic equivalents.

provides the greatest margin of safety. However, in the absence of profound regional anesthesia, the patient may experience myocardial ischemia. Local anesthetic agents may contain epinephrine 1:100,000 (0.01 mg/mL), epinephrine 1:200,000 (0.005 mg/mL), epinephrine 1:50,000 (0.02 mg/mL), or levonordefrin 1:20,000 (0.05 mg/mL), which physiologically is equivalent to epinephrine 1:100,000. (Although many textbooks caution against the use of epinephrine 1:50,000, the critical issue to consider is the total dosage of epinephrine used, and not the concentration.)

Healthy adults can safely receive up to 0.2 mg of epinephrine per visit. As mentioned earlier, cardiac risks in association with noncardiac procedures are increased in patients unable to meet a 4-MET demand (climb a flight of stairs, walk uphill, walk on level ground at 6.4 km/hr, or run a short distance). Ergometric stress testing confirmed that the hemodynamic effects of 4 METs is equivalent to that produced by 0.045 mg of epinephrine. Consequently, 4.5 mL of a local anesthetic agent with epinephrine 1:100,000, or equivalent, can be administered safely to a patient whose functional capacity is equal to or greater than 4 METs (refer to Chapter 3: *Medical Management of Acute Odontogenic Pain*). Local anesthesia may be supplemented with an oral benzodiazepine, nitrous oxide, or intravenous sedation and an opioid-based analgesic would tend to contribute to postoperative cardiovascular stability.

The patient taking antithrombotic agents. Aspirin is a relatively weak antithrombotic agent, inhibiting only thromboxane A_2-mediated platelet aggregation, and the intraoperative and postoperative impacts on invasive dental procedures are minimal. Similarly, clopidogrel, which inhibits platelet aggregation induced by adenosine diphosphate, has minimal effect on intraoperative or postoperative bleeding associated with dental procedures. However, the use of clopidogrel, in addition to aspirin, has been associated with increased risk of bleeding.

The patient taking enteric anticoagulants (warfarin). A clear relationship exists between the intensity of anticoagulation and the incidence of thromboembolism on the one hand and problematic bleeding on the other. For most medical indications, a moderate-intensity anticoagulation effect with a target international normalized ratio (INR) of 2.0 to 3.0 is appropriate. At this range, most patients can undergo routine oral surgical procedures without alterations of their warfarin regimen. However, to prevent potential serious complications, the preoperative assessment of the patient's level of anticoagulation is imperative to ensure values that may preclude problematic bleeding yet maintain therapeutic anticoagulation (INR 2.0 to 3.0). Once an acceptable therapeutic range is confirmed, one may proceed with administering local anesthesia with caution to minimize the formation of a hematoma and, using meticulous local measures such as minimal trauma, the application of local hemostatic agents and the placement of sutures to ensure hemostasis.

The patient with an implanted pacemaker or implantable cardioverter defibrillator. Current generated by medical/dental devices may affect pacing and sensing thresholds. Inhibition of both pacemakers and implantable cardioverter defibrillators (ICDs) is documented with electrosurgical units, ultrasonic scalers, and ultrasonic cleaners. The rate and rhythm of pacing appear to be unaffected by dental handpieces, amalgamators, electric pulp testers, composite curing lights, electric toothbrushes, microwave ovens, dental units and lights, endodontic ultrasonic instruments, sonic scalers, and radiographic units.

Preventive strategies

Several studies suggest a possible link between periodontal disease and atherosclerosis. Periodontal inflammation provides an environment that sup-

ports transient bacteremia during activities of daily living such as eating, brushing, and flossing. Invasion of endothelial and smooth muscle cells of the arterial wall by bacterial pathogens could initiate and/or exacerbate the inflammatory process. Current evidence also suggests that periodontal pathogens may also play a role in the thromboembolic aspects of coronary artery disease. Although there is no evidence that treatment of periodontal disease reduces the incidence of coronary artery disease, dental management plans should include appropriate oral hygiene and the use of topical rinses and fluorides. Patients with xerostomia may also benefit from the administration of a sialagogue such as pilocarpine or cevimeline hydrochloride.

Potential medical emergencies

See the Cardiovascular Emergencies section of Chapter 7: *Management of Medical Emergencies in the Oral Health Care Setting*. Other medical emergencies may be anticipated based on the patient's medical history and vital signs.

THE PATIENT TAKING INSULIN AND ORAL HYPOGLYCEMIC AGENTS

Glucose is an optional fuel for tissues such as muscle, fat, and liver because they can also use other substances to satisfy their energy needs. However, glucose is an obligate fuel for the central nervous system (CNS). Since the brain can neither synthesize nor store more than a few minutes' supply of glucose, normal cerebral function requires a continuous infusion of glucose from the circulation. Plasma glucose concentration is closely regulated by the autonomic nervous system to maintain delivery of this crucial substance to the CNS. Insulin, a simple protein synthesized by pancreatic β-cells, is one of two important hormones in carbohydrate metabolism. The other hormone, glucagon, is synthesized by pancreatic α-cells. Insulin and glucagon have opposing effects on circulating glucose levels. Insulin is a hypoglycemic agent; it stimulates cellular glucose uptake. β-cell destruction leads to absolute insulin deficiency and the patient is labeled as having type 1 diabetes mellitus. If the patient has metabolic abnormalities characterized by resistance to the action of insulin with relative insulin deficiency, excess hepatic glucose production, or an inadequate compensatory insulin secretory response, the patient is labeled as having type 2 diabetes mellitus.

Insulin

Lantus (long-acting insulin glargine)

Mechanisms of action

- Insulin is a hypoglycemic agent; it stimulates cellular glucose uptake.

Clinical indications

- Type 1 and type 2 diabetes mellitus

Oral hypoglycemic agents

Sulfonylureas	Biguanides	Thiazolidinediones
glyburide	metformin	Actos (pioglitazone)
		Avandia (rosiglitazone)

Mechanisms of action

- Sulfonylureas (glyburide) stimulate the release of insulin from pancreatic β-cells, may also decrease hepatic glucose production, and decrease insulin resistance (improve insulin's effectiveness).
- Biguanides (metformin) decrease hepatic glucose production, may decrease intestinal absorption of glucose, and decrease insulin resistance (improve insulin's effectiveness)
- Thiazolidinediones (rosiglitazole, pioglitazone) inhibit hepatic gluconeogenesis and decrease insulin resistance (improve insulin's effectiveness in muscles and adipose tissue).

Clinical indications

- Type 2 diabetes mellitus

Principles of Dental Management

When treating a patient taking insulin and/or oral hypoglycemic agents, the goals are to develop and implement timely preventive and therapeutic strategies compatible with the patient's physical and emotional ability to undergo and respond to dental care and with the patient's social and psychological needs.

Medical history

A history of polyuria, nocturia, polydipsia, polyphagia, weakness, obesity (type 2 diabetes mellitus), weight loss without dieting (type 1 diabetes mellitus), and pruritus should suggest diabetes mellitus. However, many patients do not manifest all the classic signs and symptoms. Since microvascular disease associated with diabetes mellitus, which leads to retinopathy and renal dysfunction, begins to develop 7 years before the clinical diagnosis of type 2 diabetes mellitus, oral health care providers should recognize other evidence, such as history of repeated cutaneous infections, ulcerations of the lower extremities, gradual loss of vision, easy bruising, and oral problems suggestive of undiagnosed or uncontrolled diabetes mellitus. Patients with diabetes mellitus are also more likely to have hypertension and dyslipidemia. Diabetes mellitus causes or contributes to macrovascular disease, which significantly increases the risk of coronary artery, cerebrovascular, and peripheral vascular disease. Coronary artery disease leads to unstable coronary syndromes, heart failure, and cardiac arrhythmias. Long-term hyperglycemia also produces tissue damage, which ultimately leads to historical evidence of neuropathy. When reviewing the medical history of patients with known diabetes mellitus, oral health care providers should determine the following:

- Degree of glycemic control
  - Self-monitoring of blood glucose (SMBG) allows patients to evaluate their response to therapy and assess whether glycemic targets are met.

Results of SMBG can be useful in the oral health care setting pretreatment, intratreatment, and posttreatment to prevent hypoglycemia.

- Glycohemoglobin (HbA1c) concentrations reflect mean glycemia over the preceding 6 to 12 weeks. It is useful in determining whether a patient's metabolic control has been reached and maintained during the preceding 3 months.

- The type of diabetes mellitus and how long the patient has had diabetes mellitus
- The frequency of visits to a physician and the purpose of those visits
- The type of insulin and oral drugs used
- Incidence of hypoglycemic reactions and other complications
- That the patient has taken his or her medication and has had an adequate intake of food
- The patient's functional capacity (refer to the section The Patient Taking Cardiovascular Drugs in this chapter)

Vital signs

Blood pressure. Hypertension and dyslipidemia (major causes of atherosclerosis) are comorbid conditions in diabetes mellitus. While high blood pressure ($< 180/110$ mm Hg) is not an independent predictor of cardiovascular risk in association with noncardiac procedures, it serves as a useful marker for coronary artery disease, which is also a common complication of diabetes mellitus.

Pulse pressure, rate, and rhythm. The pulse pressure correlates closely with systolic blood pressure and is a reliable cofactor that will provide further evidence to either confirm or rule out significant cardiovascular disease. Pulse rate less than 50 or greater than 120 bpm should be considered a medical emergency. In addition, premature ventricular contractions, characterized by a pronounced pause in an otherwise normal rhythm, in patients with cardiovascular diseases are significant findings.

Treatment strategies

The physiological events associated with the "stress" of a dental procedure can affect both diabetic control and cardiac function. Consequently, treatment strategies for patients with diabetes mellitus should take into consideration the patient's overall health as reflected by the patient's medical history and vital signs (Table 6-2).

Timing and length of appointments. Long, stressful procedures should be avoided. Patients should preferentially be treated in the morning, after having taken their normal insulin or oral hypoglycemic agent and after having eaten a normal breakfast.

Local anesthetic agents. For most procedures in dentistry, the use of local anesthesia provides the greatest margin of safety. However, in the absence of profound regional anesthesia, the patient may experience myocardial ischemia. When indicated, the local anesthesia may be supplemented with an oral benzodiazepine, nitrous oxide, or intravenous sedation. Epinephrine has an action opposite that of insulin. However, the minute amount of epinephrine included in local anesthetic formulations as a vasoconstrictor, to ensure profound local anesthesia for an appropriate length of time, will not appreciably raise blood glucose levels. In patients with diabetes mellitus, the presence of cardiovascular risk factors in association with dental procedures and the functional capacity of the patient should be the critical determinants for the safe use of a vasocon-

Table 6-2. Treatment Protocols for the Dental Management of Patients With Diabetes Mellitus

Predictors of Diabetic or Cardiovascular Risk	Physical Examination	Treatment Options	Consultations/Referrals
• FBG 70 to 200 mg/dL *and/or* • Intermediate or minor predictors of cardiovascular risk	• Blood pressure < 180/110 mm Hg • Normal pulse pressure, rate, and rhythm • Functional capacity > 4 METs	Comprehensive care	Routine referral to a physician for medical management and risk factor modification.
	• Blood pressure < 180/110 mm Hg • Normal pulse pressure, rate, and rhythm • Functional capacity < 4 METs	Limited care	
	• Blood pressure > 180/110 mm Hg *and/or* • Abnormal pulse pressure, rate, or rhythm	Emergency care	If patient is asymptomatic, routine referral to a physician for medical management and risk factor modification. If patient is symptomatic, immediate referral to a physician for medical management and risk factor modification.
• FBG < 70 or > 200 mg/dL *and/or* • Major predictors of cardiovascular risk	• Establish baseline vital signs	Emergency care	Immediate referral to a physician for medical management and risk factor modification.

FBG, fasting blood glucose; METs, metabolic equivalents.

strictor (refer to the section The Patient Taking Cardiovascular Drugs in this chapter).

Antibacterial agents. The reciprocal relationship between infection and poor glycemic control has led some to advocate the administration of antimicrobial prophylaxis before dental therapy, particularly in the patient with poorly controlled diabetes. However, there are no studies directly supporting this recommendation. It is axiomatic that any infection, including periodontal disease, in the patient with diabetes must be managed promptly and aggressively.

Postoperative pain management. Treatment strategies should also include effective postoperative pain management. Opioid-based analgesics effectively block not only pain, but importantly, they tend to contribute to cardiovascular stability. Possible increased hypoglycemic effect with large doses of salicylates has been reported in patients on insulin and increased hypoglycemia with large doses of salicylates has been reported in combination with chlorpropamide, a sulfonylurea. However, usual therapeutic doses of acetylsalicylic acid (ASA) have little effect. Indeed, since many patients with diabetes mellitus are taking ASA as primary or secondary therapy to prevent thromboembolic events, an opioid/ASA formulation is more appropriate than an opioid/ibuprofen formulation, which may interfere with the antiplatelet effect of ASA. Although acetaminophen (APAP) has not been implicated in these drug-drug interactions, APAP is not an anti-inflammatory agent.

Postoperative glycemic control. Procedures that may affect the patient's ability to eat must be planned in consultation with the patient's physician. It is critical that patients have a balanced intake of protein, carbohydrate, and fat in combination with an appropriate regimen of insulin and/or oral hypoglycemic agents to ensure that targeted blood glucose levels are maintained in the postoperative period.

Preventive strategies

Increased susceptibility to periodontal disease does not appear to correlate with increased levels of plaque and calculus, however patients with diabetes mellitus are at increased risk of developing periodontal disease with age, and the severity of periodontal disease increases with increased duration of diabetes. Although hard evidence on the prevalence of caries in the diabetic patient is equivocal, investigators recently reported an association between resting salivary flow rate less than 0.01 mL/min and a slightly higher prevalence of dental caries. Consequently, dental management plans should include appropriate oral hygiene and the use of topical rinses and fluorides. Patients with xerostomia may benefit from the administration of a sialagogue such as pilocarpine or cevimeline hydrochloride.

Potential medical emergencies

Refer to the Endocrine Emergencies section of Chapter 7: *Management of Medical Emergencies in the Oral Health Care Setting*. Other medical emergencies may be anticipated based on the patient's medical history and vital signs.

THE PATIENT TAKING GLUCOCORTICOSTEROIDS

The adrenal cortex secretes glucocorticoids and mineralocorticoids. The synthesis and secretion of glucocorticoids is under the control of corticotropin (ACTH) and the renin-angiotensin pathway controls mineralocorticoid secretion. Glucocorticosteroids regulate cell metabolism (at the level of translation and transcription), promote gluconeogenesis, and have pronounced anti-inflammatory and immunomodulatory effects. Mineralocorticoids promote sodium retention

in the distal convoluted tubule of the kidney. The main glucocorticoid is cortisol, with a daily secretion of 15 mg. The main mineralocorticoid is aldosterone, with a daily secretion of 100 μg.

Drugs

Systemic formulations	Inhalants/Intranasal formulations
methylprednisolone	Advair Diskus (fluticasone propionate w/ salmeterol)
prednisone	Flovent HFA (fluticasone propionate)
	fluticasone propionate
	Nasonex (mometasone furoate)

Mechanisms of action

- Decrease inflammation by suppressing the migration of polymorphonuclear leukocytes and by reducing capillary permeability.
- Suppress the immune system by reducing the volume and activity of lymphocytes.

Clinical indications

- Treatment of a variety of allergic, inflammatory, and autoimmune diseases
- Therapeutic immunosuppression in organ transplant patients
- Allergic rhinitis and asthma
- Neoplastic diseases
- Adrenocortical insufficiency (Addison disease)

Principles of Dental Management

When treating a patient taking glucocorticosteroids, the goals are to develop and implement timely preventive and therapeutic strategies compatible with the patient's physical and emotional ability to undergo and respond to dental care and with the patient's social and psychological needs.

Medical history

Hyperadrenocorticism or Cushing syndrome may result from excess endogenous ACTH and/or cortisol secretion and should be considered in patients with a history of pituitary tumors, small-cell lung carcinoma, hypothalamic abnormalities (excess corticotropin-releasing hormone [CRH]), and adrenal adenoma or carcinoma. However, most cases of Cushing syndrome are secondary to the chronic use of "therapeutic" doses of glucocorticoids prescribed or administered for the management of a variety of allergic, inflammatory, and autoimmune diseases; therapeutic immunosuppression in organ transplant patients; allergic rhinitis and asthma; certain neoplastic diseases; and adrenocortical insufficiency (Addison disease). Addison disease may also develop as a consequence of hypothalamic-pituitary-adrenal (HPA) axis suppression following the therapeutic administration of glucocorticoids and lead to an Addisonian crisis characterized by hypotension and shock.

Functional capacity. The history should also seek to determine the patient's functional capacity. This is particularly important when treating patients with adrenal dysfunction, because physiological stressors (physical, metabolic, psychological) can destabilize homeostatic mechanisms (refer to the section The Patient Taking Cardiovascular Drugs in this chapter).

Vital signs

Cortisol acts in a permissive role and allows catecholamines and angiotensin II to maintain cardiac contractility, vascular tone, and blood pressure. As a result of this increased sympathomimetic activity, heart rate, blood pressure, and respirations are increased. Hypernatremia and hypokalemia secondary to hyperadrenocorticism lead to volume expansion and hypertension. Cortisol-induced hyperglycemia may further contribute to hypertension, dyslipidemia, and cardiovascular complications. A blood pressure in excess of 180/110 mm Hg represents a hypertensive crisis. An "at rest" pulse rate below 60 or above 100 bpm in adults, if symptomatic (sweating, weakness, dyspnea, and/or chest pain), should be considered a cardiac risk in association with noncardiac procedures. Acute adrenal insufficiency is a medical emergency marked by hypotension, and a blood pressure of 90/50 mm Hg is a reliable sign of shock.

Treatment strategies

In medicine, current recommendations for glucocorticoid prophylaxis to prevent an Addisonian crisis are based on the anticipated procedure-specific magnitude of physiological stress response. There appears to be universal concordance of procedure-specific cardiovascular and Addisonian risk; clearly, the same procedure-specific factors (fluid shifts, blood loss, duration of a procedure, and other physiological events associated with the administration of general anesthetic agents) contribute to physiological stress. In view of this, it can be concluded that the risk of an Addisonian crisis in association with a dental procedure is also low or very low. Consequently, treatment strategies for a patient with adrenal dysfunction (Table 6-3) should take into consideration the patient's overall health as reflected by the patient's medical history and vital signs.

Local anesthetic agents. The physiological stress associated with the use of local anesthetic agents in patients with adrenal dysfunction is low. As mentioned earlier, cardiac risk, and by extension Addisonian risk, in association with physiological stressors increases in patients unable to meet a 4-MET demand. The hemodynamic effects of 4 METs are equivalent to that produced by 0.045 mg of epinephrine. Consequently, 4.5 mL of a local anesthetic agent with epinephrine 1:100,000, or equivalent, can be administered safely to a patient whose functional capacity is equal to or greater than 4 METs. Although local anesthesia eliminates some of the undesirable effects of general anesthesia, in the absence of profound regional anesthesia, the patient may experience increased physiological stress. When indicated, the local anesthesia may be supplemented with oral benzodiazepines, nitrous oxide, or intravenous sedation. Therapeutic strategies should also include an effective postoperative analgesic regimen, importantly one that effectively blocks the stress response and contributes to cardiovascular stability such as an opioid-based analgesic.

Corticosteroid prophylaxis in association with dental care. A consensus paper in the medical literature recommends that clinicians prescribe "stress dose" glucocorticoids in the amount equivalent to the normal physiological response to procedure-related "stress." Based on available evidence, the risk of an Addisonian crisis in association with a dental procedure is low or very

Table 6-3. Dental Management of Patients With Adrenal Dysfunction

PREDICTORS OF ADDISONIAN RISK	PHYSICAL EXAMINATION	TREATMENT OPTIONS	CONSULTATIONS/REFERRALS
Minor procedure-related stress level • Dental care AND • Local anesthesia	• Blood pressure < 180/110 mm Hg • Normal pulse pressure, rate, and rhythm • Functional capacity > 4 METs	Usual daily glucocorticoid dose during perioperative period • Comprehensive care	Routine referral to a physician for medical management and risk factor modification
	• Blood pressure < 180/110 mm Hg • Normal pulse pressure, rate, and rhythm • Functional capacity < 4 METs	Usual daily glucocorticoid dose during perioperative period • Limited care	Routine referral to a physician for medical management and risk factor modification.
	Blood pressure > 180/110 mm Hg *and/or* Abnormal pulse pressure, rate and rhythm	Usual daily glucocorticoid dose during perioperative period • Emergency care	If patient is asymptomatic, routine referral to a physician for medical management and risk factor modification. If patient is symptomatic, immediate referral to a physician for medical management and risk factor modification.

METs, metabolic equivalents.

low. Similarly, the physiological stress associated with the use of local anesthetic agents in patients with adrenal dysfunction is also low. Consequently, the anticipated perioperative physiological stress in patients undergoing dental care (minor surgical stress) under local dental anesthesia should take only their usual daily glucocorticoid dose before dental intervention. No supplementation is justified. This recommendation also takes into consideration potential risks associated with the administration of additional glucocorticosteroids such as fluid retention, hypertension, hyperglycemia, increased risk of infection, impaired wound healing, gastrointestinal bleeding, and psychiatric disturbances. If moderate or major surgical stress is anticipated under general anesthesia and the patient has documented or presumed HPA axis suppression, then appropriate "stress doses" of perioperative steroids are indicated. Topical and inhaled corticosteroids can suppress the HPA axis but rarely cause clinical adrenal insufficiency.

Preventive strategies

Hyperadrenocorticism promotes gluconeogenesis and glycogenolysis, and impairs peripheral glucose use. Indeed, an estimated 2% to 3% of patients with type 2 diabetes mellitus suffer from unrecognized Cushing syndrome. Consequently, dental management plans should include appropriate oral hygiene and the use of topical rinses and fluorides. Patients with xerostomia may benefit from the administration of a sialagogue such as pilocarpine or cevimeline hydrochloride.

Potential medical emergencies

The likelihood of an Addisonian crisis in the oral health care setting is extremely remote. Other medical emergencies may be anticipated based on the patient's medical history and vital signs. Refer to Chapter 7: *Management of Medical Emergencies in the Oral Health Care Setting*.

THE PATIENT TAKING THYROID HORMONE

Thyroid-stimulating hormone (thyrotropin or TSH), produced in the anterior pituitary, stimulates the production of cyclic adenosine monophosphate (AMP) with corresponding increases in the uptake of circulating inorganic iodide by the thyroid gland. The iodine is oxidized to organic iodine, which binds to tyrosine residues of thyroglobulin to form monoiodotyrosine (MIT) and diiodotyrosine (DIT). Two DIT molecules couple to form thyroxin (T_4) or an MIT molecule couples with one DIT molecule to form triiodothyronine (T_3). Circulating concentrations of the thyroid hormones, T_3 and T_4, are maintained at physiological levels by the interaction of the secretions of the hypothalamus and pituitary and thyroid glands.

Drugs

levothyroxine sodium

Levoxyl (levothyroxine sodium)

Synthroid (levothyroxine sodium)

Mechanisms of action

- Regulate growth and development; thermoregulation and calorigenesis; the metabolism of carbohydrates, proteins, and lipids.
- Increase oxygen consumption.
- Act synergistically with epinephrine to enhance glycogenolysis and hyperglycemia, and enhance tissue sensitivity to catecholamines possibly by up-regulation of adrenergic receptors.

Clinical indications

- Hypothyroidism

Principles of Dental Management

When treating a patient taking thyroid hormone, the goals are to develop and implement timely preventive and therapeutic strategies compatible with the patient's physical and emotional ability to undergo and respond to dental care and with the patient's social and psychological needs.

Medical history

Identifiable risk factors for thyroid dysfunction from the medical history include evidence of previous thyroid disease, surgery or radiotherapy of the thyroid gland, diabetes mellitus or a family history of diabetes mellitus, medications such as lithium carbonate and iodine-containing drugs, pernicious anemia, or primary adrenal insufficiency. Clinicians should also seek to determine the presence or absence of cardiovascular diseases (angina pectoris, coronary artery disease, arrhythmias, and congestive heart failure). There is some evidence that patients with dyslipidemia associated with overt hypothyroidism have an increased incidence of coronary artery disease and associated angina pectoris. Furthermore, some patients with hypothyroidism cannot tolerate full replacement therapy because of angina pectoris and increased incidence of myocardial infarction and sudden death. The medical history should also seek to determine the patient's functional capacity (refer to the section The Patient Taking Cardiovascular Drugs in this chapter).

Vital signs

Myxedema coma is the extreme life-threatening complication of hypothyroidism. It is characterized by hypoventilation, hypotension, and bradycardia. A systolic blood pressure less than 90 mm Hg is a reliable sign of shock. Thyroid storm is the extreme manifestation of hyperthyroidism. It is characterized by an elevated temperature, tachycardia, and high blood pressure. A blood pressure in excess of 180/110 mm Hg represents a hypertensive crisis. An "at rest" pulse rate below 60 or above 100 bpm in adults, if symptomatic (sweating, weakness, dyspnea, and/or chest pain), should be considered a cardiac risk in association with noncardiac procedures. Respiratory rates less than 10 or greater that 20 breaths per minute may indicate respiratory distress.

Treatment strategies

Hypothyroidism and hyperthyroidism adversely affect cardiac function. Thyroid dysfunction may also be associated with diabetes mellitus (Hashimoto disease) and adrenal disease (autoimmune polyglandular syndrome type 2). Consequently, treatment strategies for a patient with thyroid dysfunction (Table 6-4) should take into consideration the patient's overall health as reflected by the patient's medical history and vital signs.

The hypothyroid patient. Well-controlled, medically supervised patients on thyroid replacement and patients with mild to moderate symptoms of hypothyroidism may safely undergo routine dental care under local anesthesia. However, patients with hypothyroidism are hyperreactive to central nervous system depressants (opioid analgesics, anxiolytic agents), which should be administered judiciously.

Table 6-4. Dental Management of the Patient With Thyroid Dysfunction

- Euthyroid patient *or* patient with mild to moderate thyroid dysfunction AND/OR minor clinical predictors (advanced age, atrial fibrillation, history of stroke) OR intermediate clinical predictors (stable angina pectoris, previous myocardial infarction, compensated heart failure, renal insufficiency) of cardiovascular risk
  - Blood pressure < 180/110 mm Hg; normal pulse pressure, rate, and rhythm; functional capacity > 4 METs
    - Comprehensive dental care
    - Routine referral for medical management and risk factor modification
  - Blood pressure < 180/110 mm Hg; normal pulse pressure, rate, and rhythm; BUT functional capacity < 4 METs,
    - Appropriate limited dental care
    - Routine referral for medical management and risk factor modification
  - Blood pressure > 180/110 mm Hg OR systolic blood pressure < 90 mm Hg AND/OR abnormal pulse pressure, rate, or rhythm
    - Appropriate emergency dental care
    - If patient is symptomatic, immediate referral for medical management and risk factor modification.
    - If patient is asymptomatic, routine referral for medical management and risk factor modification.
- Patient with severe hypothyroidism OR thyrotoxicosis AND/OR major clinical predictors (unstable coronary syndrome, decompensated heart failure, severe valvular disease, significant arrhythmias) of cardiovascular risk
  - Appropriate emergency dental care
  - Immediate referral for medical management and risk factor modification

METs, metabolic equivalents.

The hyperthyroid patient. Thyroid hormones appear to act synergistically with epinephrine by increasing tissue sensitivity to catecholamines and by possibly up-regulating adrenergic receptors. An additional problem associated with the use of local anesthetic agents containing epinephrine is related to the treatment of hyperthyroid symptoms with β_1-adrenergic receptor antagonist. However, these concerns must be balanced against the value of a vasoconstrictor in inducing profound local anesthesia, which is essential in reducing the physiologic stress associated with pain. For the patient with overt evidence of hyperthyroidism, the use of vasoconstrictors should be avoided. For all other scenarios, the cautious use of vasoconstrictors, based on the patient's functional capacity, should be considered. An amount of 4.5 mL of a local anesthetic agent with epinephrine 1:100,000, or equivalent, can be administered safely to a patient whose functional capacity is equal to or greater than 4 METs. Furthermore, combination analgesics containing ASA are contraindicated in patients with hyperthyroidism because ASA interferes with the protein binding of T_4 and T_3 (increasing their free form) and leads to thyrotoxicosis.

Preventive strategies

Patients with hypothyroidism may have poor periodontal health. Patients with hyperthyroidism may have increased caries activity and periodontal disease. Consequently, dental management plans for patients with thyroid dysfunction should include appropriate oral hygiene. The use of a topical antibacterial agent is useful to combat gingivitis and other periodontal pathoses that result from plaque accumulation. For patients with xerostomia and a high incidence of dental caries, preventive modalities such as dietary analysis and counseling, and prophylaxis combined with over-the-counter home fluoride use should be implemented. A topical fluoride, 1.1% sodium fluoride in the form of a brush-on gel, may be preferred to a topical solution. Patients may also benefit from simple dietary measures such as eating carrots or celery, or by chewing sugarless or xylitol-containing gums. However, pilocarpine hydrochloride (Salagen) and cevimeline hydrochloride (Evoxac), both muscarinic agonists, may more predictably increase salivary activity.

Potential medical emergencies

The likelihood of myxedema coma or a thyroid crisis in the oral health care setting is extremely remote. Other medical emergencies may be anticipated based on the patient's medical history and vital signs. Refer to Chapter 7: *Management of Medical Emergencies in the Oral Health Care Setting*.

THE PATIENT TAKING REPRODUCTIVE HORMONES

The hypothalamic luteinizing hormone–releasing hormone (LHRH) stimulates the release of both luteinizing hormone (LH) and follicle-stimulating hormone (FSH) from the anterior pituitary gland. LH induces development of ovarian follicles, causes ovulation, and brings forth corpus luteum formation and forms ovarian steroids (progesterone) in females and androgen (testosterone) in males. FSH induces development of ovarian follicles, promotes formation of ovarian steroids (estrogen) and maintains spermatogenesis. The activities of LH and FSH are in turn regulated by feedback inhibition. In addition to negative-feedback inhibition, positive-feedback regulation has been demonstrated. During the follicular phase of the menstrual cycle, the elevated level of estrogen enhances the release of LHRH and augments the responsiveness of the pituitary gland to LHRH. Moreover, the elevated level of progesterone during ovulation imposes a positive-feedback role on FSH. Indeed, the elevated level of estrogen

and progesterone and the simultaneous surge of FSH and LH are the factors triggering ovulation.

DRUGS

Oral contraceptives	Estrogens	Estrogen modulators
Nuvaring (ethinyl estradiol w/etonogestrel)	Premarin (conjugated estrogen)	Evista (raloxifene)
Ortho Tri-Cyclen (ethinyl estradiol w/norgestimate		
Trinessa-28 (ethinyl estradiol w/norgestimate)		
Tri-Sprintec-28		
Yasmin (ethinyl estradiol w/drospirenone)		
Yaz-28 (ethinyl estradiol w/drospirenone)		

Mechanisms of action

- Estrogens and progesterones modulate the secretion of gonadotropin-releasing hormone by the hypothalamus, and the secretion of FSH and LH by the anterior pituitary.
- Estrogen receptor modulators (raloxifene)
  - Act as an estrogen receptor agonist in bone.
  - Act as an estrogen receptor antagonist in breast and uterine tissues.

Clinical indications

- Oral contraceptive formulations
  - Prevention of pregnancy or the treatment of hypermenorrhea, endometriosis, and female hypogonadism
- Estrogens
  - Atrophic vaginitis, hypogonadism, primary ovarian failure, menopausal symptoms, prostate carcinoma, and the prevention of osteoporosis
- Estrogen modulators
  - Prevention of osteoporosis in postmenopausal women
  - Palliative and adjunctive treatment for advanced breast and uterine cancer

PRINCIPLES OF DENTAL MANAGEMENT

When treating a patient taking reproductive hormones, the goal is to develop and implement timely preventive and therapeutic strategies compatible with the patient's physical and emotional ability to undergo and respond to dental care and with the patient's social and psychological needs.

Medical history

Confirm in the medical history that the patient is being treated for abnormalities of the female reproductive system; or that the patient may be on oral contraceptives or hormone replacement therapy; or that the patient may be under treatment for breast, endometrial, uterine, prostate, or renal carcinoma; or that the patient may be on prophylactic hormone therapy for osteoporosis. In patients on hormone therapy, the risk of venous thromboembolism, coronary heart disease, and stroke appears to increase within the first 1 to 2 years of therapy and these harmful effects are likely to exceed the chronic disease prevention benefits in women.

Vital signs

The blood pressure provides a clue that will either confirm or rule out significant cardiovascular disease and serves as a useful marker for coronary artery disease and myocardial ischemia. The pulse pressure correlates closely with systolic blood pressure and is a reliable cofactor that will provide further evidence to either confirm or rule out significant cardiovascular disease (refer to the section The Patient Taking Cardiovascular Drugs in this chapter).

Treatment strategies

Treatment strategies for a patient with modulation/abnormality of the reproductive system should take into consideration the patient's overall health as reflected by the patient's medical history and vital signs.

Oral contraceptives and antibacterial agents. In 1991, the American Dental Association advised dental practitioners to alert all women of childbearing age of a possible reduction in the efficacy of oral contraceptives during antibiotic therapy. A recent study reviewed the pharmacokinetic and clinical literature relative to the efficacy of oral contraceptives when taken concurrently with antibacterial agents and concluded that there are no pharmacokinetic data at this time to support the contention that oral antibacterial agents reduce the efficacy of oral contraceptives, except for rifampin, an antituberculin drug. The reviewers also concluded that there are no prospective, randomized clinical trials of oral contraceptive efficacy and the concomitant use of antibacterial agents and the case reports used to support such interactions are anecdotal, subject to recall bias, and lack adequate controls and medication documentation. In a recent decision, the United States District Court for the Northern District of California also concluded, "scientific evidence regarding the alleged interaction between antibacterial agents and oral contraceptives did not satisfy the '*Daubert* standard' of causality." However, the American Medical Association concluded that such interactions could not be completely discounted and that women should still be informed of the possibility of such interactions. Similarly, the American Dental Association Council on Scientific Affairs recommends that patients be advised of the potential risk, that patients consider alternative contraception during periods of antibacterial chemotherapy, and that patients be advised of the importance of compliance with their oral contraceptive regimen.

Preventive strategies

The actions of oral contraceptives, in a global sense, appear to mimic pregnancy. Consequently, patients may experience increased incidence of gingivitis, altered salivary flow, and potentially increased caries activity. Similarly, postmenopausal women may experience reduced salivary function, increased caries activity, gingivitis, and periodontitis, but hormone therapy appears to

inhibit gingival inflammation, periodontitis, and alveolar bone loss. However, the harmful effects of hormone therapy are likely to exceed the chronic disease prevention benefits in most women. As with all patients, the importance of appropriate oral hygiene cannot be overemphasized. Such strategies should take into consideration toothbrush design and technology to increase the effectiveness of plaque removal. The use of topical antibacterial agents is useful to combat gingivitis and other periodontal pathoses that result from plaque accumulation. For patients with xerostomia and a high incidence of dental caries, preventive modalities such as dietary analysis and counseling, and prophylaxis combined with over-the-counter home fluoride use should be implemented. A topical fluoride, 1.1% sodium fluoride in the form of a brush-on gel, may be preferred to a topical solution. Patients may also benefit from simple dietary measures such as eating carrots or celery, or by chewing sugarless or xylitol-containing gums. However, pilocarpine hydrochloride (Salagen) and cevimeline hydrochloride (Evoxac), both muscarinic agonists, may more predictably increase salivary activity.

Potential medical emergencies

The likelihood of a medical emergency in the oral health care setting associated with reproductive disorders or other conditions for which a patient may be taking a reproductive hormone is extremely remote. Other medical emergencies may be anticipated based on the patient's medical history and vital signs. Refer to Chapter 7: *Management of Medical Emergencies in the Oral Health Care Setting*.

THE PATIENT TAKING BRONCHODILATOR DRUGS

Susceptible patients may experience intermittent, reversible chronic airway inflammation and bronchoconstriction following exposure to inhaled allergens. When these antigens are recognized by the immune system, they interact with dendritic cells, the resident antigen-presenting cells of the airways. Cytokines released by T lymphocytes play a central role in orchestrating the immune response. Interleukin (IL)-4 signals B lymphocytes to produce antigen-specific immunoglobulin E (IgE), mast cell proliferation, and the expression by vascular endothelial cells of adhesion molecules for eosinophils.

Following subsequent exposure, the inhaled antigens are recognized by the IgE antibodies on the surface of mast cells, leading to mast cell degranulation and the release of inflammatory mediators such as histamine, prostaglandins, leukotrienes, and chemoattractants for eosinophils. These mediators cause immediate airway smooth muscle contraction (bronchospasm), microvascular leakage and mucous gland secretion (edema), and activate sensory nerve endings (reflex bronchoconstriction via vagal stimulation); the eosinophils release proteases, which cause epithelial damage and desquamation.

DRUGS

Beta$_2$-receptor agonists	Anticholinergic agents	Leukotriene receptor antagonists (LTRAs)
Advair Diskus (fluticasone propionate w/ salmeterol) albuterol	Combivent (ipratropium w/ albuterol)	Singulair (montelukast)
Proair HFA (albuterol)	Spiriva HandiHaler (tiotropium)	

Mechanisms of action

- Albuterol is a short-acting and salmeterol is a long-acting beta$_2$-receptor agonist, which relax bronchial smooth muscle.
- Ipratropium and tiotropium block the action of acetylcholine in bronchial smooth muscle causing bronchodilation.
- Montelukast is a selective and competitive LTRA.
  - Reduces airway edema, bronchial smooth muscle contraction, and inflammation.

Clinical indications

- Asthma
- Chronic obstructive pulmonary disease (COPD)

PRINCIPLES OF DENTAL MANAGEMENT

When treating a patient taking a bronchodilator drug, the goal is to develop and implement timely preventive and therapeutic strategies compatible with the patient's physical and emotional ability to undergo and respond to dental care and with the patient's social and psychological needs.

Medical history

Asthma. Asthma most often begins in childhood, typically before 5 to 7 years of age. In most patients the symptoms are intermittent, despite the persistence of inflammation. At the other extreme are patients who suffer cough, wheezing, and/or shortness of breath virtually all the time, which interferes with daily activities and poses a risk for severe, potentially life-threatening, acute asthma attacks. In addition to the drugs noted above, depending on the severity of asthma, patients may also be on inhaled or oral glucocorticosteroids (refer to the section The Patient Taking Glucocorticosteroids in this chapter). About 10% of asthmatic patients have a triad of aspirin-induced asthma, nasal polyps, and sinusitis.

Chronic bronchitis. Chronic bronchitis is seen most commonly in smokers 35 years or older. Severe, recurrent respiratory infections as a child and air pollution may be contributing factors. Chronic bronchitis is characterized by a productive cough. Hypoxic hypoxemia, carbon dioxide retention, respiratory acidosis, and right heart failure may occur early. Chronic hypoxemia leads to polycythemia and right heart failure leads to cyanosis. The course of the disease is gradual until heart failure occurs.

Emphysema. Emphysema is usually preceded by chronic bronchitis. It has been suggested that cigarette smoke stimulates proteases and inhibits antiprotease activity. Emphysema may also be a result of a hereditary defect (lack of

protease inhibitor) that allows for protease digestion of pulmonary elastic tissues. In advanced cases there is right heart failure, peripheral edema, and hepatomegaly.

Functional capacity. The history should also seek to determine the patient's functional capacity, an individual's ability to perform a spectrum of common daily tasks, which is expressed in terms of metabolic equivalents (METs). Cardiac risks in association with noncardiac procedures are increased in patients unable to meet a 4-MET demand (climb a flight of stairs, walk uphill, walk on level ground at 6.4 km/hr, or run a short distance).

Vital signs

The blood pressure provides a clue that will either confirm or rule out significant cardiovascular disease and serves as a useful marker for coronary artery disease and myocardial ischemia. A systolic blood pressure lower than 90 mm Hg is a reliable sign of shock. A blood pressure in excess of 180/110 mm Hg represents a hypertensive crisis. The pulse pressure correlates closely with systolic blood pressure and is a reliable cofactor that will provide further evidence to either confirm or rule out significant cardiovascular disease. An "at rest" pulse rate below 60 or above 100 bpm in adults, if symptomatic (sweating, weakness, dyspnea, and/or chest pain), should be considered a cardiac risk in association with noncardiac procedures. The patient's respiration (rate and character) should also be monitored. Respiratory rates less than 10 or greater that 20 breaths per minute may indicate respiratory distress. Patients with asthma may experience acute respiratory distress as a result of oxygenation failure. Acute respiratory distress in patients with COPD is a complication of ventilation failure.

Treatment strategies

The clinician treating a patient with asthma or COPD must develop treatment strategies taking into consideration the patient's degree of respiratory dysfunction and the patient's overall health as reflected by the patient's medical history and vital signs. The physiological events (emotional stress) associated with a dental procedure can lead to respiratory distress. Reduce anxiety and ensure profound local anesthesia during treatment. However, high-dose local anesthetic agents, anxiolytic agents, and opioid analgesics may depress respiration, mandating their judicious use.

Preventive strategies

As with all patients, the importance of appropriate oral hygiene cannot be overemphasized. Such strategies should take into consideration effectiveness of plaque removal. The use of topical antibacterial agents is useful to combat gingivitis and other periodontal pathoses that result from plaque accumulation. For patients with xerostomia and a high incidence of dental caries, preventive modalities such as dietary analysis and counseling, and prophylaxis combined with over-the-counter home fluoride use should be implemented. A topical fluoride, 1.1% sodium fluoride in the form of a brush-on gel, may be preferred to a topical solution. Patients may also benefit from simple dietary measures such as eating carrots or celery, or by chewing sugarless or xylitol-containing gums. However, pilocarpine hydrochloride (Salagen) and cevimeline hydrochloride (Evoxac), both muscarinic agonists, may more predictably increase salivary activity.

Potential medical emergencies

Refer to the section on Respiratory Emergencies in Chapter 7: *Management of Medical Emergencies in the Oral Health Care Setting*. Other medical emergencies may be anticipated based on the patient's medical history and vital signs.

THE PATIENT TAKING HISTAMINE$_1$-RECEPTOR ANTAGONISTS

Histamine is a biogenic amine synthesized primarily in mast cells and basophils, some cells of the gastric mucosa, and histaminergic neurons in the CNS. The actions of histamine are mediated by histamine binding to H_1, H_2, or H_3 receptors. H_1 receptor activation is involved chiefly in inflammation and allergic reactions. They are expressed primarily on vascular endothelial cells and smooth muscle cells. Stimulation of H_1 receptors results in edema (blood vessel dilation and increased vascular permeability), bronchospasm, and sensitization of primary efferent nerve terminals. H_2 receptors are expressed primarily on parietal cells of the gastric mucosa where they act synergistically with gastrin and acetylcholine to regulate acid secretion. H_3 receptors are expressed on presynaptic nerve terminals in the CNS.

Drugs

fexofenadine

meclizine

promethazine

Zyrtec (cetirizine)

Mechanisms of action

- Compete with histamine at H_1-receptor sites in the gastrointestinal, vascular, and respiratory systems.

Clinical indications

- Perennial and seasonal allergic rhinitis
- Urticaria and other allergic symptoms

Principles of Dental Management

When treating a patient who is taking an H_1-receptor antagonist, the goal is to develop and implement timely preventive and therapeutic strategies compatible with the patient's physical and emotional ability to undergo and respond to dental care and with the patient's social and psychological needs.

Medical history

Confirm in the medical history evidence of perennial and seasonal allergic rhinitis, urticaria, or other allergic symptoms. Many patients habitually take drugs for minor complaints and often do not recognize nonprescription medications as drugs and, therefore, may not mention the use of antihistamines. This is particularly important to note since most first-generation antihistamines are over-the-counter formulations. First-generation antihistamines (meclizine, promethazine) have high lipid solubility and readily penetrate the blood-brain barrier, which accounts for the sedative effect (H_3 receptor blockade) of these drugs. Other side effects include xerostomia as a result of a weak anticholinergic effect. Second-generation H_1-receptor antagonists (fexofenadine, cetirizine) are ionized at physiologic pH, are highly protein bound, are less likely to diffuse into the CNS, and, consequently, do not produce significant sedation.

Vital signs

Because first-generation H_1-receptor antagonists are CNS depressants, it would be prudent to establish baseline blood pressure and pulse rate and character before the initiation of dental care. A systolic blood pressure lower than 90 mm Hg is a reliable sign of shock and a blood pressure in excess of 180/110 mm Hg represents a hypertensive crisis. An "at rest" pulse rate below 60 or above 100 bpm in adults, if symptomatic (sweating, weakness, dyspnea, and/or chest pain), should be considered a cardiac risk in association with noncardiac procedures. Furthermore, because patients may be taking these medications for the treatment of allergies associated with asthma-like symptoms, the patient's respiration (rate and character) should also be recorded. Respiratory rates less than 10 or greater that 20 breaths per minute may indicate respiratory distress.

Treatment strategies

Treatment strategies for a patient taking H_1-receptor antagonists should take into consideration the patient's overall health as reflected by the patient's medical history and vital signs. Because first-generation H_1-receptor antagonists may produce sedation, the coadministration of other CNS depressants (anxiolytic agents, local anesthetic agents, opioid analgesics) may lead to further CNS depression. Monitor the dosages administered carefully.

Preventive strategies

Because a weak anticholinergic effect associated with H_1-receptor antagonists produces xerostomia, dental management plans should include appropriate oral hygiene. The use of topical antibacterial agents is useful to combat gingivitis and other periodontal pathoses that result from plaque accumulation. For patients with xerostomia and a high incidence of dental caries, preventive modalities such as dietary analysis and counseling, and prophylaxis combined with over-the-counter home fluoride use should be implemented. A topical fluoride, 1.1% sodium fluoride in the form of a brush-on gel, may be preferred to a topical solution. Patients may also benefit from simple dietary measures such as eating carrots or celery, or by chewing sugarless or xylitol-containing gums. However, pilocarpine hydrochloride (Salagen) and cevimeline hydrochloride (Evoxac), both muscarinic agonists, may more predictably increase salivary activity.

Potential medical emergencies

The likelihood of a medical emergency in the oral health care setting associated with seasonal or perennial allergic rhinitis is extremely remote. Other medical emergencies may be anticipated based on the patient's medical history and vital signs. Refer to Chapter 7: *Management of Medical Emergencies in the Oral Health Care Setting*.

THE PATIENT TAKING HISTAMINE$_2$-RECEPTOR ANTAGONISTS AND PROTON PUMP INHIBITORS

Histamine is a biogenic amine synthesized primarily in mast cells and basophils, some cells of the gastric mucosa, and histaminergic neurons in the CNS. The actions of histamine are mediated by histamine binding to H_1, H_2, or H_3 receptors. The major function of the histamine (H_2) receptor is to mediate gastric acid secretion in the stomach. This receptor subtype is expressed on parietal cells of the gastric mucosa, where it acts synergistically with gastrin and acetyl-

choline. These substances bind their respective receptors on parietal cells, which increases the cytoplasmic accumulation of Ca^{2+}. Ca^{2+} activates protein kinase C, which phosphorylates and activates the H^+/K^+ ATPase (proton pump). The proton pump, by exchanging intracellular H^+ for extracellular K^+, effectively increases H^+ concentration in the gastric and duodenal lumen. Increased concentration of H^+ in the gastric and duodenal lumen and in the esophagus (secondary to reflux), in susceptible patients, may lead to epithelial cell damage.

DRUGS

Histamine$_2$-receptor antagonists

ranitidine

Proton pump inhibitors

Aciphex (rabeprazole)

Nexium (esomeprazole)

omeprazole

Prevacid (lansoprazole)

Protonix (pantoprazole)

Mechanisms of action

- Histamine$_2$-receptor antagonists competitively block H_2-receptors in parietal cells resulting in reduced gastric acid secretion.
- Proton pump inhibitors suppress gastric acid secretion by inhibiting parietal H^+/K^+ ATPase.

Clinical indications

- Gastroesophageal reflux disease (GERD)
- Peptic ulcer disease (PUD)

PRINCIPLES OF DENTAL MANAGEMENT

When treating a patient taking an H_2-receptor antagonist and/or a proton pump inhibitor, the goal is to develop and implement timely preventive and therapeutic strategies compatible with the patient's physical and emotional ability to undergo and respond to dental care and with the patient's social and psychological needs.

Medical history

Confirm in the medical history evidence of GERD and/or PUD. The drug history may reveal evidence of prior or current H_2-receptor antagonist and/or a proton pump inhibitor therapy. Note that some formulations are available over the counter and some patients may also routinely self-administer antacids. The primary determinant of GERD appears to be transient relaxations of the lower esophageal sphincter (not induced by a swallow), most commonly after meals. Episodes of transient relaxation are exacerbated in the presence of a hiatal hernia, obesity, and smoking (nicotine relaxes the lower esophageal sphincter). The typical symptom associated with GERD is substernal burning pain radiating up to the neck (relieved immediately by antacids) brought on by positions that encourage gastroesophageal reflux, mainly lying flat and stooping after a meal. The main pathophysiological mechanisms involved in PUD are *Helicobacter pylori* infection and the use of cyclooxygenase (COX)-1

inhibitors. Stress, alcohol, caffeine, cigarette smoking, and genetic factors further exacerbate the injury. The principal symptom is abdominal pain. The patient often has a history of remissions, with complete freedom from symptoms for weeks or months. Vomiting may also occur with PUD and the patient is predisposed to hemorrhage, perforation, and pyloric stenosis.

Vital signs

The typical symptom associated with GERD is substernal burning pain mimicking pain of cardiac origin. The blood pressure provides a clue that will either confirm or rule out significant cardiovascular disease and serves as a useful marker for coronary artery disease and myocardial ischemia. The pulse pressure correlates closely with systolic blood pressure and is a reliable cofactor that will provide further evidence to either confirm or rule out significant cardiovascular disease.

Treatment strategies

Treatment strategies for a patient taking H_2-receptor antagonists and/or proton pump inhibitors should take into consideration the patient's overall health as reflected by the patient's medical history and vital signs. COX-1 inhibitors are the drugs of choice in the medical management of odontogenic pain. However, the gastrointestinal tract is the most common target for the adverse effects of these drugs. COX-1 inhibitor–induced gastrointestinal damage is attributable to both topical as well as systemic effects. COX-1 inhibitors are weak acids that readily cross into gastric epithelial cells. In the neutral pH intracellular environment they become ionized, accumulate (ion trapping), and cause cell damage. The systemic injury is related to decreased prostaglandin synthesis. Decreased prostaglandin synthesis leads to increased gastric acid secretion, decreased bicarbonate and mucus production, and decreased blood flow.

Preventive strategies

Dental management plans should include appropriate oral hygiene. The use of topical antibacterial agents is useful to combat gingivitis and other periodontal pathoses that result from plaque accumulation. For patients with xerostomia and a high incidence of dental caries, preventive modalities such as dietary analysis and counseling, and prophylaxis combined with over-the-counter home fluoride use should be implemented. A topical fluoride, 1.1% sodium fluoride in the form of a brush-on gel, may be preferred to a topical solution. Patients may also benefit from simple dietary measures such as eating carrots or celery, or by chewing sugarless or xylitol-containing gums. However, pilocarpine hydrochloride (Salagen) and cevimeline hydrochloride (Evoxac), both muscarinic agonists, may more predictably increase salivary activity.

Potential medical emergencies

The likelihood of a medical emergency in the oral health care setting associated with GERD or PUD is extremely remote. Other medical emergencies may be anticipated based on the patient's medical history and vital signs. Refer to Chapter 7: *Management of Medical Emergencies in the Oral Health Care Setting*.

THE PATIENT TAKING AN ANXIOLYTIC AGENT

Excitatory and inhibitory amino acid neurotransmitters regulate a diverse array of behavioral processes. The primary inhibitory neurotransmitter in the CNS is gamma- aminobutyric acid (GABA). There are two main types of GABA receptors ($GABA_A$ and $GABA_B$). Activation of $GABA_A$ receptors results in conformational changes that open ligand-gated Cl^- ion channels. GABA binding to $GABA_B$ recep-

tors activates G proteins, which open K^+ channels and allow for efflux K^+ ions. The inward flow of Cl^- and efflux of K^+ result in hyperpolarization and decrease the excitability of target cells. Thereby, GABAergic neurotransmission depresses the CNS.

Drugs

Ambien (zolpidem)

Ambien CR (zolpidem CR)

alprazolam

clonazepam

diazepam

lorazepam

Lunesta (eszopiclone)

zolpidem

Mechanisms of action

- The benzodiazepines (alprazolam, clonazepam, diazepam, lorazepam) potentiate GABA binding to $GABA_A$ receptors and increase the duration of Cl^- channel opening.
- Zolpidem and eszopiclone are structurally different from the benzodiazepines; however, they have a similar mechanism of action.

Clinical indictions

- Anxiety
- Alcohol detoxification
- Panic attack
- Seizures
- Preoperative sedation
- Insomnia
- Muscle spasm

Principles of Dental Management

When treating a patient taking a $GABA_A$ receptor agonist, the goal is to develop and implement timely preventive and therapeutic strategies compatible with the patient's physical and emotional ability to undergo and respond to dental care and with the patient's social and psychological needs.

Medical history

Benzodiazepines are used as anxiolytics, hypnotics, antiepileptics, muscle relaxants, and prophylactic drugs against the symptoms of ethanol withdrawal. A significant number of patients are taking these drugs for the treatment of anxiety. Symptoms of anxiety may be associated medical (cardiovascular, metabolic, respiratory) and psychiatric illness (depressive syndrome, psychoses) or psychological anxiety (phobias). Evaluation directed toward the patient's

"somatic locus" of anxiety, the system most prominently affected, provides the greatest yield to the investigating clinician.

Vital signs

When $GABA_A$ receptor agonists are prescribed for the treatment of symptoms of anxiety associated with systemic disease, determination of baseline vital signs before the initiation of dental intervention may be prudent. The blood pressure provides a clue that will either confirm or rule out significant cardiovascular disease and serves as a useful marker for coronary artery disease and myocardial ischemia. The pulse pressure correlates closely with systolic blood pressure and is a reliable cofactor that will provide further evidence to either confirm or rule out significant cardiovascular disease. Furthermore, because patients may be taking these medications for the treatment of anxiety associated with respiratory abnormalities, the patient's respiration (rate and character) should also be recorded. Respiratory rates less than 10 or greater that 20 breaths per minute may indicate respiratory distress.

Treatment strategies

Treatment strategies for a patient taking a $GABA_A$ receptor agonist should take into consideration the patient's overall health as reflected by the patient's medical history and vital signs. Benzodiazepines, when used alone, rarely cause significant CNS depression; however, ethanol, other CNS depressants, and opioid analgesics may enhance their CNS effect, mandating judicious concomitant use.

Preventive strategies

Dental management plans should include appropriate oral hygiene. The use of topical antibacterial agents is useful to combat gingivitis and other periodontal pathoses that result from plaque accumulation. For patients with xerostomia and a high incidence of dental caries, preventive modalities such as dietary analysis and counseling, and prophylaxis combined with over-the-counter home fluoride use should be implemented. A topical fluoride, 1.1% sodium fluoride in the form of a brush-on gel, may be preferred to a topical solution. Patients may also benefit from simple dietary measures such as eating carrots or celery, or by chewing sugarless or xylitol-containing gums. However, pilocarpine hydrochloride (Salagen) and cevimeline hydrochloride (Evoxac), both muscarinic agonists, may more predictably increase salivary activity.

Potential medical emergencies

The likelihood of a medical emergency in the oral health care setting associated with the conditions for which a patient may be taking a $GABA_A$ receptor agonist is extremely remote. Other medical emergencies may be anticipated based on the patient's medical history and vital signs. Refer to Chapter 7: *Management of Medical Emergencies in the Oral Health Care Setting*.

THE PATIENT TAKING AN ANTICONVULSANT

Seizures are one of the most common neurological disorders affecting humans. A symptom rather than a disease, it is characterized by recurrent convulsions. The seizures stem from acute changes in the availability of excitatory or inhibitory neurotransmitters within the brain and are accompanied by sudden disturbances in sensory and/or motor function. Seizures are classified according to their clinical manifestations as either partial (begins focally) or generalized (begins generally and involves both hemispheres). Under physiological conditions, neuronal action potentials are propagated by alternating currents of de-

polarizing Na^+ influx and hyperpolarizing K^+ efflux. At the same time, the firing neurons activate neighboring neurons and interneurons that transmit inhibitory (GABA) signals resulting in "surround inhibition." These events impose a limit on the frequency of firing (prevent repetitive firing). Disruption of this intricate balance (abnormal synchronous discharge) is characteristic of all forms of seizures. Finally, T-type calcium channels associated with relay neurons connecting the thalamus to the cortex, which under physiological conditions are depolarized and inactive during the awake state, may undergo paroxysmal hyperpolarization initiating an absence (petit mal) seizure.

GABA-mediated inhibitors	Inhibitors of voltage-gated calcium channels	Inhibitors of voltage-gated sodium channels	Unknown mechanisms
Clonazepam	Lyrica (pregabalin)	Lamictal (lamotrigine)	Topamax (topiramate)
Depakote (valproic acid)			
Depakote SR (valproic acid)			
gabapentin			

Mechanisms of action

- Anticonvulsants, by different mechanisms of action (see above), appear to stabilize neuronal activity in the CNS.

Clinical indications

- Seizure disorders

Principles of Dental Management

When treating a patient taking anticonvulsants, the goal is to develop and implement timely preventive and therapeutic strategies compatible with the patient's physical and emotional ability to undergo and respond to dental care and with the patient's social and psychological needs.

Medical history

Partial seizures. Partial seizures, defined as aberrant motor or psychomotor activity, result from a local discrete spread of excitation. Simple motor seizures often follow physical injury to the head: trauma to the motor cortex is characterized by involuntary, repetitive movement; abnormal activity in the sensory cortex may produce paresthesia; and trauma to the visual cortex produces flashing lights. Consciousness is typically preserved. Psychomotor or complex partial seizures are caused by abnormal activity in the temporal or frontal lobes and are preceded by an aura, may produce altered consciousness, and are often associated with involuntary automatism such as smacking of lips or wringing of hands. Partial seizures may progress to secondary generalized seizure.

Tonic-clonic (grand mal) seizures. Tonic-clonic (grand mal) seizures are characterized by loss of consciousness usually preceded by an aura (visual, auditory, epigastric, or psychic). Initial convulsions explosively force air out of the lungs, resulting in the epileptic "cry." Generalized motor tonic-clonic seizures follow this eerie, birdlike scream. The tonic component of the seizure is

characterized by opisthotonos, the arched position (convexity in the ventral body region) caused by the violent spasm of back muscles. The clonic component is characterized by rhythmic movements (contraction and relaxation of muscles) of all limbs. Postseizure depression of motor and sensory function is common.

Absence (petit mal) seizure. Absence (petit mal) seizure is a form of generalized seizure characterized by sudden, brief interruption of consciousness. They are termed absence seizures because these attacks cause the patient to simply stare off into space. Patients do not experience an aura but occasional motor symptoms such as smacking of lips or rapid blinking may be noted. Commonly seen in the prepubertal years.

Myoclonic attacks. Myoclonic attacks are generalized seizures characterized by rhythmic body jerks without loss of consciousness. Symptoms may affect individual muscles or may be generalized to all muscle groups of the body contributing to falls. Myoclonic attacks are most often seen in patients with uremia, hepatic failure, hereditary degenerative conditions, and in association with Creutzfeldt-Jacob disease.

Vital signs

Since patients taking anticonvulsants may experience a seizure attack while in the oral health care setting, determination of baseline blood pressure and pulse pressure, rate, and rhythm before the initiation of dental intervention may be prudent. Furthermore, respiratory depression is a potential serious complication of a seizure attack. Baseline respiration (rate and character) should be recorded and the respiration should be monitored closely in the postictal period. Respiratory rates less than 10 or greater that 20 breaths per minute may indicate respiratory distress.

Treatment strategies

Treatment strategies for a patient taking anticonvulsants should consider the patient's degree of seizure control and overall health as reflected by the patient's medical history and vital signs. Confirm the patient's compliance with anticonvulsant chemotherapy. Reduce anxiety and ensure profound local anesthesia during treatment. Anticonvulsants, when used alone, rarely cause significant CNS depression; however, ethanol, other CNS depressants, high-dose local anesthetic agents, and opioid analgesics may enhance their CNS effect, mandating judicious concomitant use.

Preventive strategies

Gingival hyperplasia is one of the well-known effects of phenytoin use. Consequently, dental management plans should include appropriate oral hygiene. The use of topical antibacterial agents is useful to combat gingivitis and other periodontal pathoses that result from plaque accumulation. For patients with xerostomia and a high incidence of dental caries, preventive modalities such as dietary analysis and counseling, and prophylaxis combined with over-the-counter home fluoride use should be implemented. A topical fluoride, 1.1% sodium fluoride in the form of a brush-on gel, may be preferred to a topical solution. Patients may also benefit from simple dietary measures such as eating carrots or celery, or by chewing sugarless or xylitol-containing gums. However, pilocarpine hydrochloride (Salagen) and cevimeline hydrochloride (Evoxac), both muscarinic agonists, may more predictably increase salivary activity.

Potential medical emergencies

Refer to the section on Neurological Emergencies in Chapter 7: *The Management of Medical Emergencies in the Oral Health Care Setting*. Other medical

emergencies may be anticipated based on the patient's medical history and vital signs.

THE PATIENT TAKING AN ANTIPSYCHOTIC AGENT

Peripheral adrenergic neurons and most central adrenergic neurons employ norepinephrine as their main neurotransmitter, however some central adrenergic neurons synthesize and use dopamine. There are two main classes of dopamine receptors (D_1 and D_2). They can be found throughout the brain, but their pattern of distribution varies greatly. The cerebral cortex and limbic structures are innervated by dopaminergic cell bodies from the midbrain, which appear to play a role in motivation, goal-directed thinking, regulation of affect, and positive reinforcement (reward). In addition, serotonin ($5HT_2$) receptor activation appears to lower the threshold for neuronal firing in the CNS (particularly the cortex). The biochemical theory suggests that dysregulation of dopaminergic and/or serotonergic neurotransmission in mesolimbic and mesocortical systems appears, at least partially, to be involved in the pathogenesis of psychoses.

DRUGS

Abilify (aripiprazole)

Risperdal (risperidone)

Seroquel (quetiapine)

Zyprexa (olanzapine)

Mechanisms of action

- Antipsychotic agents are mixed serotonin-dopamine receptor antagonists that bind to serotonin ($5HT_2$) and to dopamine (D_2) receptors.
- These drugs also antagonize alpha$_1$- and alpha$_2$-adrenergic, and histamine (H_1) receptors with relatively high affinity.

Clinical indications

- Psychotic disorders (schizophrenia)
- Dementia in the elderly

Principles of Dental Management

When treating a patient taking an antipsychotic agent, the goal is to develop and implement timely preventive and therapeutic strategies compatible with the patient's physical and emotional ability to undergo and respond to dental care and with the patient's social and psychological needs.

Medical history

The medical history should seek to determine evidence of major disturbances in thought content, bizarre behavior, a regression in intellectual functioning, inappropriate affective expression, and frequent hallucinations and delusions. The social history might suggest social/occupational dysfunction. Confirm the patient's compliance with antipsychotic chemotherapy.

Vital signs

Both dopamine and serotonin are in the catecholamine family of neurotransmitters and mixed serotonin-dopamine receptor antagonist drugs also antagonize alpha$_1$- and alpha$_2$-adrenergic and histamine (H_1) receptors with relatively high affinity. Consequently, determination of baseline blood pressure and pulse pressure, rate, and rhythm before the initiation of dental intervention may be prudent.

Treatment strategies

Treatment strategies for a patient taking antipsychotic drugs should take into consideration the patient's degree of control and overall health as reflected by the patient's medical history and vital signs. Confirm the patient's compliance with antipsychotic chemotherapy. Patients may not understand complex treatment plans or tolerate long appointments. Reduce anxiety and ensure profound local anesthesia during treatment. Antipsychotic drugs, when used alone, rarely cause significant CNS depression; however, ethanol, other CNS depressants, high-dose local anesthetic agents, and opioid analgesics may enhance their CNS effect, mandating judicious concomitant use.

Preventive strategies

Self-care regresses markedly below the level achieved before the onset of psychosis. Consequently, dental management plans should include appropriate oral hygiene. The use of topical antibacterial agents is useful to combat gingivitis and other periodontal pathoses that result from plaque accumulation. For patients with xerostomia and a high incidence of dental caries, preventive modalities such as dietary analysis and counseling, and prophylaxis combined with over-the-counter home fluoride use should be implemented. A topical fluoride, 1.1% sodium fluoride in the form of a brush-on gel, may be preferred to a topical solution. Patients may also benefit from simple dietary measures such as eating carrots or celery, or by chewing sugarless or xylitol-containing gums. However, pilocarpine hydrochloride (Salagen) and cevimeline hydrochloride (Evoxac), both muscarinic agonists, may more predictably increase salivary activity.

Potential medical emergencies

The likelihood of a medical emergency in the oral health care setting associated with psychiatric disorders and dementia is extremely remote. Other medical emergencies may be anticipated based on the patient's medical history and vital signs. Refer to Chapter 7: *Management of Medical Emergencies in the Oral Health Care Setting*.

THE PATIENT TAKING AN ANTIDEPRESSANT

The serotonin (5HT) and norepinephrine (NE) neurotransmitter systems are diffusely projecting systems that modulate the firing of neurons in a diffuse or global manner. 5HT-containing cells within the raphe nuclei and NE-containing cells within the locus ceruleus project broadly throughout the cerebral cortex with other projections to the limbic system. The metabolic cycle of both 5HT and NE involve neurotransmitter synthesis, uptake into synaptic vesicles, exocytosis, reuptake into the cytoplasm, and reuptake into vesicles or degradation. Regulation of the levels of 5HT and NE can occur at any of these steps and 5HT and NE also autoregulate their own release. Both 5HT and NE play critical roles in regulating mood and are involved in many other complex neuropsychiatric processes.

Drugs

Selective serotonin reuptake inhibitors (SSRIs)	Tricyclic antidepressants (TCAs)	Atypical antidepressants
Celexa (citalopram)	Amitriptyline HCl	Budeprion ZL (bupropion)
Effexor XR (venlafaxine) fluoxetine HCl		Cymbalta (duloxetine) trazodone HCl
Lexapro (escitalopram)		Wellbutrin XL (bupropion)
paroxetine HCl		
sertraline HCl		

Mechanisms of action

- SSRIs inhibit serotonin reuptake increasing synaptic serotonin levels, causing increased 5HT receptor activation and enhanced postsynaptic responses.
- TCAs inhibit the reuptake of 5HT and NE from the synaptic cleft by blocking 5HT and NE transporters.
- Bupropion, duloxetine, and trazodone inhibit the reuptake of 5HT and NE from the synaptic cleft by a mechanism not fully understood.

Clinical indications

- Depression
- Neuropathic pain

Principles of Dental Management

When treating a patient taking an antidepressant, the goal is to develop and implement timely preventive and therapeutic strategies compatible with the patient's physical and emotional ability to undergo and respond to dental care and with the patient's social and psychological needs.

Medical history

Major depressive disorder (MDD) and bipolar disorder (BPD) are both characterized by extremes in mood. MDD is characterized by recurrent major depressive events and BPD is defined by the presence of mania. The social history might suggest social/occupational dysfunction. Confirm the patient's compliance with antidepressant chemotherapy. Patients with MDD may relate a persistent depressed mood or loss of interest in nearly all activities, weight change or significant change in appetite, insomnia, psychomotor slowing, fatigue or loss of energy, impaired concentration, sense of worthlessness or guilt, and thoughts of suicide or death. An abnormally elevated mood, inflated self-esteem, or grandiosity; rapid, loud, emphatic speech; and psychomotor agitation characterize a manic episode.

Vital signs

Although rare, the most serious side effects of antidepressants (serotonin syndrome) involve the cardiovascular system and are characterized by tachycar-

dia, cardiac arrhythmia, hypertensive crisis, and stroke. Other clinical manifestations include hyperthermia, muscle rigidity, and fluctuations in mental state. Consequently, determination of baseline blood pressure and pulse pressure, rate, and rhythm before the initiation of dental intervention may be prudent.

Treatment strategies

Treatment strategies for a patient taking antidepressant drugs should take into consideration the patient's degree of control and overall health as reflected by the patient's medical history and vital signs. Confirm the patient's compliance with antidepressant chemotherapy. Patients may not understand complex treatment plans or tolerate long appointments. Reduce anxiety and ensure profound local anesthesia during treatment.

Preventive strategies

Self-care may regress with MDD. Consequently, dental management plans should include appropriate oral hygiene. The use of topical antibacterial agents is useful to combat gingivitis and other periodontal pathoses that result from plaque accumulation. For patients with xerostomia and a high incidence of dental caries, preventive modalities such as dietary analysis and counseling, and prophylaxis combined with over-the-counter home fluoride use should be implemented. A topical fluoride, 1.1% sodium fluoride in the form of a brush-on gel, may be preferred to a topical solution. Patients may also benefit from simple dietary measures such as eating carrots or celery, or by chewing sugarless or xylitol-containing gums. However, pilocarpine hydrochloride (Salagen) and cevimeline hydrochloride (Evoxac), both muscarinic agonists, may more predictably increase salivary activity.

Potential medical emergencies

The likelihood of a medical emergency in the oral health care setting associated with MDD and BPD is extremely remote. Other medical emergencies may be anticipated based on the patient's medical history and vital signs. Refer to Chapter 7: *Management of Medical Emergencies in the Oral Health Care Setting*.

THE PATIENT TAKING A BISPHOSPHONATE

To maintain strength over time and to respond adaptively to physical stress, human bone is continually resorbed and reformed. Remodeling is carried out by a coordinated activity of basic multicellular units (BMUs) in which the cellular components are osteoclasts and osteoblasts. Osteocytes, which form a large, communicating network with their cytoplasmic processes, appear to direct bone remodeling. They help maintain the material and structural properties of bone by acting as mechanoreceptors, i.e., identifying sites for remodeling when prevailing physical loads are sensed and require adaptation.

Bisphosphonates

Fosamax (alendronate)

Actonel (risedronate)

Boniva (ibandronate)

Mechanisms of action

- Bisphosphonates (BPs) are analogues of pyrophosphate and tend to concentrate in bone, where they are incorporated into the mineralized matrix.
  - BPs remain in the matrix until the bone is subsequently remodeled, at which time osteoclasts dissolve the mineral matrix and release the BPs.
  - Some of the released BP molecules are internalized by the osteoclasts, leading to osteoclastic apoptosis, and a resultant antiresorptive effect.
  - Apoptosis of osteoclasts leads to reduced synthesis of matrix-derived cytokines and failure to activate osteoblast precursors.

Clinical indications

- Osteopetrosis/osteoporosis
- Paget disease
- Hypercalcemia in malignancies (multiple myeloma, breast, prostate, others)

Principles of Dental Management

An increasing body of literature suggests that BPs may lead to BP-related osteonecrosis of the jaw (BRONJ). Case definition for BRONJ must meet the following criteria: (1) current or previous treatment with BPs; (2) exposed, necrotic bone in the maxillofacial region that has persisted for more than 8 weeks; and (3) no history of radiation therapy to the jaws. The absolute risk of BRONJ following exposure to intravenous BP preparations is quite high (>5 per 100 patients). The absolute risk of BRONJ following exposure to oral BPs is remote, although the long-term effects of oral BP therapy requires further analysis. Most cases of BRONJ occur after a tooth extraction or other dentoalveolar surgery; however, BRONJ can occur spontaneously or following minor trauma.

Medical history

The medical history should seek to identify patients with osteopetrosis, osteoporosis, Paget disease, and/or hypercalcemia in malignancies (e.g., multiple myeloma, breast, prostate, others) who may have been treated or who are now being treated with oral or intravenous (IV) BPs.

Treatment strategies

Treatment strategies should take into consideration the patient's overall health as reflected by the patient's medical history and vital signs, and the patients drug history, i.e., history of oral versus IV BP therapy (Table 6-5).

Preventive strategies

Dental management plans should include appropriate oral hygiene. The use of topical antibacterial agents is useful to combat gingivitis and other

Table 6-5. Risk Stratification and Dental Management of the Patient With a History of Bisphosphonate Use

- At-risk categories
  - Current or previous treatment with oral BPs with no apparent exposed or necrotic bone
    - Treatment strategies
      - Patient education
      - No alteration or delay in planned dental care
  - Current or previous treatment with IV BPs with no apparent exposed or necrotic bone
    - Treatment strategies
      - Patient education
      - Nonrestorable teeth may be treated by removal of the crown followed by endodontic treatment of the remaining roots
- BRONJ
  - Stage 1– Exposed/ necrotic bone with no evidence of infection
    - Treatment strategies
      - Remove mobile segments of bony sequestrum
      - Prescribe an antibacterial mouthrinse
      - Follow-up at least quarterly
      - Patient education
  - Stage 2– Exposed/necrotic bone with pain, and infection with or without purulent exudate in the region.
    - Treatment strategies
      - As in Stage 1
      - Prescribe a broad-spectrum antibacterial agent
      - Pain control
  - Stage 3– Exposed/necrotic bone with pain, infection, and one or more of the following: extraoral sinus tract, extensive osteolysis, or pathologic fracture
    - Treatment strategies
      - As in Stages 1 and 2
      - Surgical debridement/resection for long-term palliation

BP, bisphosphonate; BRONJ, BP-related osteonecrosis of the jaw; IV, intravenous.

periodontal pathoses that result from plaque accumulation. For patients with a high incidence of dental caries, preventive modalities such as dietary analysis and counseling, and prophylaxis combined with over-the-counter home fluoride use should be implemented. A topical fluoride, 1.1% sodium fluoride in the form of a brush-on gel, may be preferred to a topical solution. Patients with xerostomia may also benefit from simple dietary measures such as eating carrots or celery, or by chewing sugarless or xylitol-containing gums. However,

pilocarpine hydrochloride (Salagen) and cevimeline hydrochloride (Evoxac), both muscarinic agonists, may more predictably increase salivary activity.

Potential medical emergencies

Medical emergencies may be anticipated based on the patient's medical history and vital signs. Refer to Chapter 7: *Management of Medical Emergencies in the Oral Health Care Setting*.

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INTRODUCTION

With advances in medicine, oral health care providers are called upon to provide dental care to an ever-increasing number of medically and pharmacologically compromised patients. Consequently, oral health care providers can expect to face situations that may threaten the physical well-being of their patients. Poor preparation for such an eventuality is inexcusable. Being the subject of public censure or accused of negligence is an agony best prevented. This section summarizes common medical emergencies that require immediate response in the dental office. Clinicians must recognize these common disorders and learn to act promptly. The treatment procedures included are those activities a clinician "can't afford not to do" when faced with an unexpected urgent problem.

BEING PREPARED FOR MEDICAL EMERGENCIES

Oral health care providers must be able to assess the physical and emotional ability of a patient to tolerate dental care; identify high-risk patients who may experience a medical emergency; and know how to sustain life with their hands, their breaths, a few basic therapeutic agents, and a great deal of common sense. An awareness of the medical history and the various medications commonly prescribed for patients to self-administer will assist clinicians in anticipating the most commonly encountered medical diagnoses and provide valuable information that will help in identifying high-risk patients who may experience a life-threatening medical emergency.

Never Treat a Stranger

Determine the patient's medical history prior to all therapeutic interventions.

Assess the Patient's Vital Signs

- Blood pressure (all patients)
- Pulse pressure, rate, and character (all patients)
- Rate and character of respiration (patients with respiratory abnormalities)
- Body temperature (patients with infection)

Determine the Patient's Risk Status

Risk status I

- No evidence of overt systemic disease
- No limitation on physical activity
- Excellent functional capacity

Risk status II

- Evidence of systemic disease
- Medically stable
- No limitation on physical activity
- Good functional capacity

Risk status III

- Evidence of systemic disease
- Medically fragile
- Limitation of physical activity
- Moderate functional capacity

Risk status IV

- Evidence of systemic disease
- Condition(s) constant threat to life
- No physical activity
- Poor functional capacity

Know What to Look For

Be familiar with the signs and symptoms of the various medical emergencies that may occur in the oral health care setting.

Be Alert

Monitor the patient's physical well-being during treatment and look for evidence of adverse reactions, particularly when drugs are being administered.

Check Emergency Equipment and Supplies Regularly

Ensure that the equipment is functioning properly and that the emergency drugs are not past their expiration date.

First Do No Harm

Be adequately trained in emergency medicine and practice with staff under simulated emergency conditions.

Develop an Emergency Team

1. The dentist (emergency team supervisor)
    a. Assesses level of consciousness
    b. Performs physical examination
        i. Obtains initial vital signs
    c. Determines the course of treatment
    d. Initiates cardiopulmonary resuscitation (CPR)
2. Second member
    a. Notifies staff
    b. Gathers emergency equipment and supplies
    c. Prepares therapeutic agents for administration by the dentist
        i. Administers oxygen
    d. Assists with cardiopulmonary resuscitation (CPR)
3. Third member
    a. Monitors vital signs
    b. Records information in the patient's chart
    c. Makes phone calls
    d. Assists with CPR
    e. Performs other tasks

BASIC EMERGENCY PROCEDURES

Primary Survey

Five fundamental steps are to be implemented in every emergency situation. Life-threatening problems identified in the primary survey must be treated immediately.

1. Assess responsiveness
    a. Alert
    b. Disoriented
    c. Unresponsive
        i. PERRLA (pupils equal, round, reactive to light, and accommodate)
            1. Constricted, as in drug overdose
            2. Dilated, as in shock
            3. Unequal, as in stroke
2. Check airway
    a. Is the airway open?
        i. Check for movement of air
            1. Look to see whether the chest rises
            2. Listen for airflow
            3. Feel the chest wall for movement
    b. Is the patient properly positioned?
    c. Are respirations effortless or labored with stridor or wheezing?
        i. Check for excessive or frothy saliva and other causes of partial obstruction
    d. Is there complete foreign body obstruction?
        i. If a complete obstruction is suspected, immediately begin procedures to remove obstruction
3. Check breathing
    a. If the patient is responsive and talking, the patient is breathing at this time
    b. Check the rate of respiration
        i. Rates less than 10 or greater that 20 breaths per minute may indicate respiratory distress
            1. In case of respiratory distress, provide positive pressure respiration
4. Check pulse rate
    a. Is there a palpable pulse?
        i. Pulse rates less than 50 beats or greater than 120 beats per minute should be considered a medical emergency
            1. Check for signs of inadequate perfusion (diaphoresis, weakness, dyspnea, chest pain)
        ii. Unresponsiveness and the absence of a palpable pulse must be assumed to be a result of cardiac arrest
            1. Call emergency medical service (EMS)
            2. Immediately begin CPR
5. Check blood pressure
    a. Blood pressure less than 90/50 mmHg
        i. Reliable sign of shock
    b. Blood pressure greater than 180/120 mmHg
        i. Hypertensive syndrome

c. Sudden drop in blood pressure (20/10 mmHg) following abrupt positional change

i. Postural hypotension

Nota bene

Unresponsiveness and the absence of a palpable pulse must be assumed to be a result of sudden cardiac arrest. At least 50% of the patients experiencing sudden cardiac arrest have ventricular fibrillation. Consequently, the clinician should think of defibrillation immediately after completing the primary survey.

1. Early CPR and defibrillation provide the best chance of survival for the patient
   a. Oral health care facilities should have a defibrillator and the emergency team should be trained to use it to determine whether a defibrillator shock should be administered to the patient
2. Patients with cardiac arrest who are not in ventricular fibrillation will require continued CPR until the emergency medical service team arrives

Secondary Survey

If the patient is conscious and is communicative, a focused history and physical examination will assist the clinician in identifying the cause of the acute illness. Review or determine the following:

1. Chief complaint
   a. Signs and symptoms
2. Allergies
3. Medications
4. Past medical history
5. Last oral intake of food
6. Events leading up to this incident

Nota bene

The secondary survey directs the clinician to specific problem areas so that he or she may proceed with the physical examination that focuses only on those organ systems that may be associated with the patient's complaints and/or the primary survey findings. The purpose of the secondary survey is to identify problems that are usually not immediately life threatening but require immediate stabilization.

CARDIOVASCULAR EMERGENCIES

The Patient With Vasopressor Syncope

Vasopressor syncope is defined as a sudden brief loss of consciousness. It is a result of cerebral ischemia caused by dilation of resistance vessels. Because cerebral vascular resistance cannot compensate for the dilation of resistance vessels, cerebral blood flow becomes significantly reduced and precipitates a generalized, progressive, autonomic discharge. The initial appropriate adrenergic response to precipitating factors is overwhelmed by a cholinergic response just before unconsciousness.

Predisposing factors

1. Anxiety
    a. Personal and environmental stress
2. Pain
3. Heat and humidity
4. Cardiovascular disorders
    a. Dysrhythmia
    b. Postural hypotension
5. Cerebrovascular insufficiency

Prevention

1. Identify high-risk patient
    a. Reduce stress
    b. Ensure profound local anesthesia
    c. Treat patient in a supine position
    d. Recognize presyncope

Signs and symptoms

1. Adrenergic component
    a. Feeling of anxiety
    b. Pallor
    c. Pupillary dilation
    d. Hyperventilation
    e. Tachycardia
2. Cholinergic component
    a. Perspiration
    b. Nausea
    c. Salivation
    d. Bradycardia
    e. Hypotension
    f. Loss of consciousness
    g. Convulsion (rarely)

Treatment

1. Place patient in a supine position
    a. Head and chest parallel to the floor
    b. Feet slightly elevated
2. Administer oxygen
    a. 4 to 6 L/minute by nasal cannula
3. Stimulate cutaneous reflexes
    a. Cold towel
    b. Amyl nitrate
4. Evaluate pulse rate, respiratory rate, and blood pressure every 10 minutes

5. If at any time the patient becomes unresponsive with no palpable pulse
    a. Call EMS
    b. Initiate CPR
        i. Automated external defibrillator

Nota bene

Most cases of syncope are benign, especially in young adults who may only require reassurance. Syncope in a patient older than 50 years of age should be regarded as serious. Initiate a medical consultation to determine underlying cause.

The Patient With Postural Hypotension

Postural hypotension is defined as a decline of 20 mmHg or more in the systolic blood pressure, or a decline of 10 mmHg or more in the diastolic blood pressure, or an increase in pulse rate of 20 beats/minute or more, and the presence of accompanying symptoms of cerebral hypoperfusion following postural change from a supine to an upright position. When a patient assumes an upright posture, approximately 500 to 700 mL of blood is pooled in the lower extremities and in splanchnic and pulmonary tissues leading to a decrease in venous blood return to the heart. In susceptible patients, this reduction in blood volume and inadequate cardiovascular compensation for the decline in cardiac preload can lead to postural hypotension.

Predisposing factors

1. Impaired homeostatic mechanisms of blood pressure regulation
    a. Age-related physiological changes
    b. Disease-related physiological changes
    c. Antihypertensive medications
    d. Recent intake of food

Prevention

1. Identify high-risk patients
    a. Schedule dental appointments 30 to 60 minutes after the ingestion of meals and medications
    b. Following treatment, allow susceptible patients to assume an upright position gradually

Signs and symptoms

1. No prodromal signs and symptoms
2. Syncope when the patient assumes an upright position
3. A decline of 20 mmHg or more in the systolic blood pressure

    or

    A decline of 10 mmHg or more in the diastolic blood pressure

    or

    An increase in pulse rate of 20 beats/minute or more

Treatment

1. Return patient to supine position for 5 to 10 minutes
    a. Evaluate pulse rate, blood pressure, and respiratory rate
    b. Administer oxygen
        i. 4 to 6 L/minute by nasal cannula

2. Allow patient to assume a sitting position for at least 2 minutes
    a. Evaluate pulse rate, blood pressure, and respiratory rate
3. Allow patient to stand for 2 minutes
    a. Evaluate pulse rate, blood pressure, and respiratory rate
4. If at any time the patient becomes unresponsive with no palpable pulse
    a. Call EMS
    b. Initiate CPR
        i. Automated external defibrillator

Nota bene

Postural hypotension, often observed in older patients, may result in significant morbidity from associated falls. The lack of prodromal signs and symptoms associated with postural hypotension should prompt oral health care providers to take preemptive action.

1. A systolic blood pressure of less than 90 mmHg is a reliable sign of shock

The Patient With Hypertensive Crisis

Hypertension is defined as a systolic blood pressure greater than 140 mmHg or a diastolic blood pressure greater than 90 mmHg. Hypertensive urgency is defined as a systolic blood pressure greater than 180 mmHg or a diastolic blood pressure greater than 110 mmHg. Hypertensive emergency is defined as a systolic blood pressure greater than 200 mmHg or a diastolic blood pressure greater than 140 mmHg. The mechanisms that lead to hypertensive crises are unclear, but a rise in vascular resistance seems to be a necessary initial step. Increased vasoreactivity can be precipitated by the release of vasoconstrictive substances such as angiotensin II or norepinephrine or can occur as a result of relative hypovolemia.

Predisposing factors

1. Hypertensive emergencies in the oral health care setting are usually associated with patients with unrecognized or undertreated hypertension
    a. Primary hypertension
        i. Hereditary and environmental factors
    b. Secondary hypertension
        i. Renal disease
        ii. Adrenal disease
        iii. Coarctation of the aorta
        iv. Hyperthyroidism
        v. Pregnancy (eclampsia)
        vi. Autonomic hyperactivity
        vii. Central nervous system (CNS) disorders
        viii. Sleep apnea
        ix. Medications (drug-related and drug-induced)

Prevention

1. Identify high-risk patient
    a. Reduce anxiety

b. Determine the patient's functional capacity
    i. Use local anesthetic agents containing a vasoconstrictor with caution but ensure profound local anesthesia

Signs and symptoms

1. Restlessness
2. Flushed face
3. Headache, dizziness, tinnitus
4. Visual disturbances
5. Dyspnea
    a. Pulmonary edema/congestive heart failure
6. A "hammering" pulse
7. Blood pressure greater than 180/110 mmHg
8. Altered mental state
9. Chest pain
    a. Myocardial ischemia, infarction, or aortic dissection
10. Seizure
    a. Hypertensive encephalopathy

Treatment

1. Elevate the patient's head
2. Administer oxygen
    a. 4 to 6 L/minute by nasal cannula
3. Hypertensive urgency (blood pressure greater than 180/110 mmHg)
    a. Blood pressure should be lowered within a few hours
        i. Same day referral to a physician
4. Hypertensive emergency (blood pressure greater than 200/140 mmHg)
    a. Blood pressure should be reduced immediately
        i. Administer nitroglycerin
            1. 0.4 mg, tablet/spray, sublingual (SL)
        ii. Call EMS
        iii. Evaluate pulse rate, blood pressure, and respiratory rate every 5 minutes
        iv. If at any time the patient becomes unresponsive with no palpable pulse
            1. Initiate CPR
                a. Automated external defibrillator

Nota bene

If inadequately treated, a hypertensive syndrome (hypertensive urgency or emergency) can progress to cerebral hemorrhage, coma, and death.

The Patient With Angina Pectoris

Angina pectoris is a clinical syndrome characterized by substernal discomfort or pressure often described as heavy, squeezing, crushing, or tight, associated with transient ischemia to the myocardium. It is in response to increased

cardiac oxygen demand in the presence of decreased perfusion (anoxia or hypoxia) of the myocardium.

Predisposing factors

1. Decreased perfusion of the myocardium
    a. Obstruction of the coronary arteries by fatty deposits (atherosclerosis)
2. Increased myocardial oxygen demand
    a. Physical exertion
    b. Emotional stress
    c. Cold
    d. Meals

Prevention

1. Identify high-risk patient
    a. Reduce anxiety
    b. Determine the patient's functional capacity
        i. Use local anesthetic agents containing a vasoconstrictor with caution but ensure profound local anesthesia

Signs and symptoms

1. Mild-to-moderate substernal pain of sudden onset
    a. Squeezing
    b. Tight
    c. Heavy
    d. Radiates to the left shoulder, arm, and jaw

Treatment

1. Allow patient to assume a comfortable position
2. Note the time and administer nitroglycerin
    a. 0.4 mg, tablet/spray, SL
3. Administer oxygen
    a. 2 to 4 L/minute by nasal cannula
4. Evaluate pulse rate, blood pressure, and respiratory rate
5. If pain is not relieved 5 minutes after the initial dose, repeat nitroglycerin
    a. 0.4 mg, tablet/spray, SL
6. Evaluate pulse rate, blood pressure, and respiratory rate
7. If pain is not relieved 10 minutes after the initial dose, repeat nitroglycerin
    a. 0.4 mg, tablet/spray, SL
8. Chest pain lasting more than 10 minutes must be assumed to be myocardial infarction
    a. Call EMS
9. If at any time the patient becomes unresponsive with no palpable pulse
    a. Initiate CPR
        i. Automated external defibrillator

Nota bene

Rest and nitroglycerin often relieve angina pectoris. Adverse reaction to nitroglycerin includes flushing, headache, dizziness, nausea, and vomiting. Syncope and paradoxical angina pectoris due to nitrate-induced vasodilation has been reported.

The Patient With Myocardial Infarction

Myocardial infarction is caused by abrupt ischemia to a portion of the myocardium resulting in necrosis (myocardial cell death). The ischemia (hypoxia or anoxia) is primarily a result of occlusion of the large and medium-sized arteries of the heart.

Predisposing factors

1. Atherosclerotic plaques and thrombus formation
    a. When the fibrous atherosclerotic plaques are large enough, they become occlusive
    b. In later stages, atherosclerotic plaques may become disrupted and contribute to thrombus formation

Prevention

1. Identify high-risk patients
    a. Reduce anxiety
    b. Determine the patient's functional capacity
        i. Use local anesthetic agents containing a vasoconstrictor with caution, but ensure profound local anesthesia

Signs and symptoms

1. Substernal chest pain
    a. Radiates to the arms, neck, shoulders, or jaw
2. Weakness, dizziness, and palpitation
3. Nausea
4. Dyspnea, tachypnea, or apnea
5. Pallor/cyanosis
6. Diaphoresis
    a. Cool, clammy skin
7. Hypotension
    a. Systolic blood pressure less than 90 mmHg
8. Tachycardia (over 100 beats/minute)

Treatment

1. Call EMS
2. Place patient in a semireclining position
3. Administer oxygen
    a. 6 L/minute by nasal cannula
        i. In case of respiratory distress or altered mental state
            1. Provide positive pressure ventilation

4. Monitor pulse rate, blood pressure, and respiration
5. If at any time the patient becomes unresponsive with no palpable pulse
    a. Initiate CPR
        i. Automated external defibrillator

Nota bene

Signs and symptoms of myocardial infarction vary from mild, vague discomfort to cardiogenic shock, which is a life-threatening emergency with an overall mortality rate to greater than 80%. Furthermore, patient denial may minimize symptoms and elderly and diabetic patients have a higher incidence of silent myocardial infarction characterized by vague symptoms of shortness of breath, epigastric distress, hypotension, and altered mental state.

NEUROLOGICAL EMERGENCIES

The Patient With Cerebrovascular Accident

Cerebrovascular stroke (CVS) is a syndrome associated with an interruption of the blood supply to a portion of the brain resulting in transient, reversible, or irreversible ischemia. Most commonly, a CVS is secondary to an evolving blood clot associated with atherosclerosis, which progressively blocks a cerebral artery. Alternatively, it may be the result of an embolus that lodged in a cerebral artery, obstructing blood flow, or caused by hemorrhage into brain tissue from a ruptured cerebral blood vessel.

Predisposing factors

1. Cardiovascular disease
    a. Atherosclerosis
    b. Valvular disease
    c. Atrial fibrillation
    d. Recent myocardial infarction ($<$ 6 months)
2. Dyslipidemia
3. Hypertension
4. Diabetes mellitus
5. Transient ischemic attacks
6. Drugs
    a. Amphetamines
    b. Cocaine
    c. Oral contraceptives
7. Smoking

Prevention

1. Identify high-risk patient
    a. Reduce anxiety
    b. Determine the patient's functional capacity
        i. Use local anesthetic agents containing a vasoconstrictor with caution, but ensure profound local anesthesia

Sign and symptoms

1. Headache, stiffness in the neck
2. Nausea and vomiting
3. Pupils unequal
4. Slurred speech
5. Motor dysfunction
    a. Facial drooping
    b. Hemiplegia
6. Generalized or focal seizure
7. Altered mentation
8. Blood pressure is often elevated while the heart rate is decreasing

Treatment

1. Call EMS
2. Provide a calm and quiet environment
3. Administer oxygen
    a. 2 to 4 L/minute by nasal cannula
        i. In case of respiratory distress or altered mental state
            1. Provide positive pressure ventilation
4. Monitor vital signs
    a. Blood pressure
        i. If blood pressure is high, elevate head slightly
    b. Heart rate
    c. Respiration
5. Monitor mental state

Nota bene

During the first day of a stroke, neither progression nor outcome can be predicted. Be reassuring to the patient, but do not make exaggerated claims that everything will be all right. About 20% of the patients die. Any neurological deficit noted after 6 months should be considered permanent.

The Patient With Seizure

Seizure is a sudden episode of cerebral dysfunction characterized by altered motor activity, sensory phenomenon, and unconsciousness. It is the result of focal or generalized disturbance of cortical function caused by excessive discharge of cerebral neurons.

Predisposing factors

1. Epilepsy
2. Head trauma
3. Cerebrovascular accident
4. Hypoxia
5. Drug or alcohol overdose or withdrawal
6. Hypoglycemia

7. Psychogenic "hysterical" seizures
8. Exogenous factors
    a. Sensory input (sound, light, touch, smell)
    b. Anxiety
    c. Heat exhaustion (sodium depletion)

Prevention

1. Identify high-risk patient
    a. Eliminate causative or precipitating factors
    b. Confirm compliance with anticonvulsant chemotherapy
    c. Reduce anxiety
    d. Ensure profound local anesthesia

Signs and symptoms

1. Aura phase
    a. Visual and auditory disturbances
    b. Dizziness
2. Sudden loss of consciousness
3. Tonic-clonic phase
    a. Tongue biting
    b. Increased salivation
    c. Incontinence
    d. Hyperventilation
4. Postictal phase
    a. Fatigue, mental confusion, and amnesia

Treatment

1. Protect patient from injury
    a. It may be safer to leave patient in the dental chair
        i. Otherwise, lower patient to the floor
    b. Guide the extremities during seizure, but do not restrain
2. After the seizure is complete
    a. Suction if needed
    b. Position patient on his or her side (recovery position)
    c. Administer oxygen
        i. 4 to 6 L/minute by nasal cannula
            1. In case of respiratory depression or altered mental state
                a. Provide positive pressure ventilation
                b. Call EMS
    d. Monitor vital signs
        i. Blood pressure
        ii. Heart rate
        iii. Rate and character of respiration

Nota bene

In the postictal phase, monitor respiration closely. Respiratory depression can lead to death. Be prepared to initiate CPR. If the patient has a history of diabetes mellitus, rule out hypoglycemia (tachycardia, pallor, and diaphoresis).

RESPIRATORY EMERGENCIES

The Patient With Hyperventilation

Hyperventilation is a state of decreased systemic carbon dioxide concentration. Cerebral hypoxia secondary to cerebral vasoconstriction increases the rate (> 20 breaths/minute) and depth of respiration, which results in low carbon dioxide concentration and an elevated arterial pH (respiratory alkalosis).

Predisposing factors

1. Pain
2. Anxiety (personal and environmental stress)
3. Cardiopulmonary disease (cardiogenic shock, chronic obstructive pulmonary disease, pulmonary edema)
4. Stimulants (drugs, cola, coffee, tea)

Prevention

1. Identify high-risk patient
    a. Reduce anxiety
    b. Ensure profound local anesthesia

Signs and symptoms

1. Frequent, deep, and sighing respiration
2. Light-headedness and dizziness
3. Paresthesia
    a. Burning or prickling feeling of the face and extremities
4. Tonic muscle spasm
5. Tightness in the chest
6. Syncope

Treatment

1. Provide a calm and quiet environment
    a. Allow patient to assume a comfortable position
    b. Reassure the patient with soothing words
2. Instruct the patient to take in a shallow breath and hold it as long as possible
    a. Repeat this sequence 6 to 10 times
3. Alternatively, have patient rebreathe expired air from a paper bag
4. If hyperventilation is secondary to a medical condition other than anxiety
    a. Call EMS

Nota bene

The most common predisposing factor associated with hyperventilation is anxiety. Patients usually give a history of dyspnea and anxiety, often precipitated by personal or environmental stress. These patients respond well to preoperative sedation. However, hyperventilation may also be from hypoxia associated with cardiopulmonary disease. Patients who relate a history of hyperventilation secondary to a medical condition other than anxiety should not receive preoperative sedation.

The Patient With Asthma

Asthma is a clinical syndrome characterized by reversible bronchial constriction and/or excessive mucous secretions leading to too little oxygen in the blood. It is an inflammatory response to a variety of stimuli. Susceptible patients experience bronchial smooth muscle contraction, inflammatory cell infiltration into the alveoli, edema of the airway mucosa, and increased mucous secretions. The alveoli tend to increase in diameter with inhalation but collapse on exhalation, causing a pronounced extended and forced expiratory phase, and may lead to "air-trapping."

Predisposing factors

1. Extrinsic asthma
    a. Pollens and other allergens
2. Intrinsic asthma
    a. Pollutants such as smoke and dust
    b. Physical or emotional stress
    c. Infection

Prevention

1. Identify high-risk patients
    a. Reduce stress
    b. Ensure profound local anesthesia
    c. Avoid respiratory depressants
    d. Use cyclooxygenase-inhibitors with caution

Signs and symptoms

1. Coughing, wheezing, shortness of breath (dyspnea)
2. Anxiety, restlessness, agitation
3. Pallor and/or cyanosis of the lips
4. Noticeable use of the accessory muscles of respiration
5. Patient may become confused and lethargic

Treatment

1. Place patient in a sitting position
2. Provide a calm and quiet environment
    a. Allow patient to assume a comfortable position
    b. Reassure the patient with soothing words

3. Administer oxygen
    a. 2 to 4 L/minute by nasal cannula
4. Administer a short-acting beta$_2$-agonist bronchodilator
    a. Two puffs of albuterol by metered-dose inhaler
5. In case of respiratory depression or altered mental state
    a. Provide positive pressure ventilation
    b. Call EMS

Nota bene

When ventilating an asthmatic patient, squeeze the bag only until resistance is felt or the chest starts to rise and allow time for expiration. Attempting to ventilate with large volumes of air or too rapidly will increase "air-trapping" and may lead to pneumothorax. Patients with a particularly severe ongoing asthma attack (status asthmaticus) who do not respond to usual treatment may progress to acute respiratory failure and death. They must have rapid transport to an advanced life support (ALS) unit.

Acute Respiratory Distress in a Patient With Chronic Obstructive Pulmonary Disease (COPD)

Acute respiratory distress is characterized by either too little oxygen or too much carbon dioxide in the blood secondary to a functional abnormality, which interferes with gas exchange. It may result from oxygenation failure or from ventilation failure. Acute respiratory distress in patients with COPD is a complication of ventilation failure.

Predisposing factors

1. Ventilation failure
    a. COPD
        i. Progressive destruction of lung tissue
            1. Chronic bronchitis
                a. Excess mucus production in response to smoking; exposure to allergens, chemicals, and pollutants; recurrent infections
            2. Emphysema
                a. Decreased elasticity leading to distention of the alveoli, which become filled with trapped air

Prevention

1. Identify high-risk patient
    a. Reduce anxiety
    b. Ensure profound local anesthesia

Signs and symptoms

1. Shallow, labored breathing
    a. Wheezing, gasping, coughing
2. Anxiety, restlessness, agitation

3. Pallor and/or cyanosis of the lips
4. Noticeable use of the accessory muscles of respiration

Treatment

1. Place patient in a sitting position
2. Provide a calm and quiet environment
    c. Allow patient to assume a comfortable position
    d. Reassure the patient with soothing words
3. Administer oxygen
    a. 2 L/minute by nasal cannula
4. Administer a short-acting beta$_2$-agonist bronchodilator
    a. Two puffs of albuterol by metered-dose inhaler
5. In case of respiratory depression or altered mental state
    a. Provide positive pressure ventilation
    b. Call EMS

Nota bene

Patients with COPD in acute respiratory distress need oxygen, despite the possibility that raising the blood oxygen level could reduce the drive to breathe. Never withhold oxygen from a COPD patient in respiratory distress. When ventilating a patient with COPD, squeeze the bag only until resistance is felt or the chest starts to rise and allow time for expiration. Attempting to ventilate with large volumes of air or too rapidly will increase "air-trapping" and may lead to pneumothorax. Patients in severe respiratory distress who do not respond to usual treatment must have rapid transport to an ALS unit.

The Patient With Upper Airway Obstruction

Upper airway obstruction is characterized by inspiratory retractions at supraclavicular and intercostal spaces, and diaphragmatic movements without evidence of airflow.

Predisposing factors

1. Common causes of upper airway obstruction
    a. Blood, mucus, or vomitus
    b. Foreign body
    c. Spasm or edema of the vocal cords
2. In an unconscious person, upper airway obstruction is commonly due to posterior tongue displacement into the oropharynx secondary to loss of muscle tone

Prevention

1. Identify high-risk patient
    a. Medical history
        i. Allergies (latex)
2. High-volume suctioning
3. Oropharyngeal curtain

Signs and symptoms

1. Universal sign of choking distress
2. Ineffective respiratory efforts
3. Agitated patient
4. Cyanosis
5. Loss of consciousness

Treatment

1. Position patient properly
    a. Head tilt with chin or neck lift
        i. Check for movement of air
            1. Look to see whether the chest rises
            2. Listen for airflow
            3. Feel the chest wall for movement
2. Ask the patient to speak
    a. If the patient is responsive and talking, the patient is breathing at this time
        i. If respirations are labored with stridor or wheezing
            1. Check for excessive or frothy saliva and other causes of partial obstruction
        ii. Inspiratory retractions at supraclavicular and intercostal spaces, and diaphragmatic movements without evidence of airflow suggest complete obstruction
            1. Check for evidence of foreign body or other causes of complete obstruction (angioedema)
3. Foreign body obstruction
    a. Call EMS
    b. Immediately begin procedures for the removal of foreign body
        i. Position the patient
            1. Deliver five abdominal thrusts
            2. Use finger sweep
            3. Attempt ventilation
            4. Repeat 1, 2, and 3 until airway is cleared

Nota bene

Complete airway obstruction for more than 5 minutes may lead to cardiac arrest and brain damage. However, CPR is of no value until upper airway obstruction is cleared. If complete obstruction persists for more than 5 minutes, it may be necessary to perform a cricothyroidectomy.

ALLERGIC REACTIONS

The Patient With an Anaphylactic Reaction

In susceptible patients, type I (immediate) hypersensitivity reactions follow initial exposure to an allergen, which result in antigen-specific antibody production dominated by the immunoglobulin E (IgE) isotype.

Predisposing factors

1. Following reexposure to a specific antigen, IgE antibodies bind to mast cells, basophils, and eosinophils associated with mucosal and epithelial tissues
    a. The simultaneous binding of an antigen to adjacent IgE molecules fixed to Fc receptors triggers degranulation of mast cells and basophils resulting in the production and release of histamine, leukotrienes, prostaglandins, chemokines, enzymes, and cytokines in target tissues
        i. Histamine produces peripheral vasodilatation and increased capillary permeability
        ii. Leukotrienes and prostaglandins promote smooth muscle contraction, increased vascular permeability, and increased mucous secretion
        iii. Chemokines attract leukocytes
        iv. Enzymes break down tissue matrix proteins
        v. Cytokines promote inflammatory activities

Prevention

1. Identify high-risk patient
    a. Medical history

Signs and symptoms

1. 1 to 15 minutes following exposure to a specific allergen
    a. Coughing, sneezing, wheezing
    b. Agitation, flushing, palpitation
    c. Pruritus, urticaria, angioedema
    d. Unresponsiveness, convulsion, shock

Treatment

1. Place patient in a recumbent position with legs elevated
2. Immediately treat with epinephrine 1:1000
    a. Adult: epinephrine (EpiPen), 0.3 mg, intramuscular (anterolateral thigh); may be repeated in 20 minutes if necessary
    b. Child: epinephrine (EpiPen Jr), 0.15 mg, intramuscular (anterolateral thigh); may be repeated in 20 minutes if necessary
    c. Maintain the airway and administer 100% oxygen
        i. Provide positive pressure ventilation with 100% oxygen
3. Call EMS
4. If at any time the patient becomes unresponsive with no palpable pulse
    a. Initiate CPR
        i. Automated external defibrillator

Nota bene

While patients taking beta-adrenergic blocking agents may require more epinephrine to reverse the effects of anaphylaxis, for patients with cardiovascular diseases and/or diabetes mellitus, start treatment with smaller doses of epinephrine.

The Patient With Delayed Hypersensitivity Reaction

Type IV (delayed) hypersensitivity reactions are closely related to cellular immunity in that specifically sensitized $CD4^+$ T lymphocytes initiate the reaction. Initial sensitization occurs slowly, over a 10- to 14-day period. Small molecular weight drugs bind covalently to host cell membrane proteins or "hapten-carrier conjugates."

Predisposing factors

1. Following reexposure to a specific antigen, the immunologically committed lymphocytes react with the allergen (antigens) and release cytokines (lymphokines)
    a. Lymphokines activate macrophages resulting in the production and release of histamine, leukotrienes, prostaglandins, chemokines, enzymes, and cytokines in target tissues

Prevention

1. Identify the high-risk patient
    a. Medical history

Signs and symptoms

1. 6 to 48 hours following exposure to a specific antigen
    a. Fever, malaise
    b. Erythema, pruritus, urticaria
    c. Perioral paresthesia, angioedema
    d. Wheezing

Treatment

1. Identify drugs and other potential allergens to which the patient may have been exposed in the clinical process
2. Verify that the onset of signs and symptoms was after the initiation of pharmacological or clinical intervention
    a. Determine the time interval between the initiation of drug therapy or clinical intervention and the onset of signs and symptoms
3. If the patient is still exposed to the suspected allergen, stop its use
4. If the patient relates wheezing, instruct patient or caretaker to call EMS
5. In the absence of respiratory distress
    a. Prescribe diphenhydramine hydrochloride, 25 to 50 mg, orally, 4 times a day
    b. Arrange supervision of the patient for at least 6 hours after the onset of signs and symptoms

Nota bene

Instruct caretaker to call EMS immediately if the patient's status deteriorates.

ENDOCRINE EMERGENCIES

The Patient With Hypoglycemia

Hypoglycemia is defined as an abnormally low plasma glucose level. Because the brain depends on plasma glucose as its major metabolic fuel, the

CNS regulates the plasma glucose level to ensure adequate glucose transport into the brain. Plasma glucose deficiency leads to autonomic nervous system stimulation (epinephrine and glucagon release) and ultimately CNS dysfunction. Hypoglycemia is characterized by acute, rapid onset and may represent a life-threatening situation if unrecognized.

Predisposing factors

1. Most commonly treatment with insulin and an oral hypoglycemic agent
    a. Delayed, decreased, or missed meal
    b. Decreased carbohydrate content of a meal
2. Increased rates of insulin absorption as a result of increased skin temperature owing to high ambient environmental temperatures
3. Heavy exercise
4. Anxiety
5. Infection

Prevention

1. Identify high-risk patients
    a. Medical history
2. Confirm compliance
    a. Insulin
    b. Oral hypoglycemic agents
    c. Food intake
3. Reduce anxiety

Signs and symptoms

1. Weakness, hunger, dizziness, sweating
2. Tachycardia (palpitation)
3. Anxiety, tremor
4. Headaches
5. Visual and mental disturbances
6. Respiration may be normal to shallow
7. The pulse may be full and pounding
8. The blood pressure is usually normal

Treatment

1. If the patient is responsive
    a. Administer a glass of fruit juice
    or
    3 tbsp of sugar with water
2. If the patient is unresponsive
    a. Apply a spread of sucrose paste (cake icing) on oral soft tissues
    or
    Administer glucagon, 1 mg, intramuscularly or SL
    b. Call EMS
    c. Administer oxygen
        i. 4 to 6 L/minute by nasal cannula

Nota bene

Most of the signs and symptoms of hypoglycemia are caused by the hypoglycemia-induced release of epinephrine, which causes glycogenolysis and promotes gluconeogenesis and lipolysis. Visual disturbances and altered mentation are secondary to the inadequate energy supply to the brain. Distress in a patient with diabetes mellitus must always be assumed to be a result of hypoglycemia.

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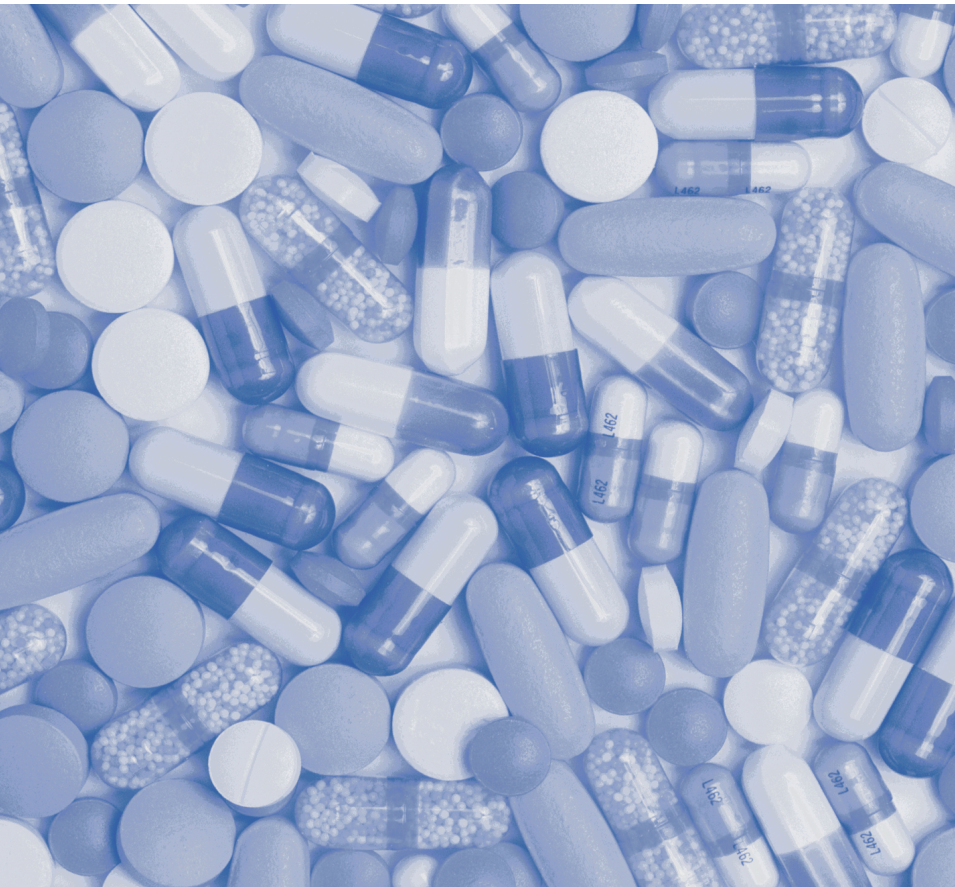
2. Terezhalmy GT, Batizy LG, eds. Urgent Care in the Dental Office. An Essential Handbook. 1st ed. Chicago: Quintessence Publishing Co, Inc, 1998.

A to Z
Listing of Drugs



abacavir sulfate (ab-ah-KAV-ear SULL-fate)

Ziagen

Drug Class: Antiretroviral, nucleoside reverse transcriptase inhibitor

PHARMACOLOGY

Action

Converted by cellular enzymes to carbovir triphosphate, which inhibits HIV-1 reverse transcriptase and interferes with DNA synthesis.

Uses

Treatment of HIV-1 in combination with other antiretroviral agents.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Insomnia and other sleep disorders; headache.

GI: Nausea; vomiting; diarrhea; loss of appetite; anorexia; pancreatitis.

MISC: Hypersensitivity reactions (e.g., fever, rash, fatigue, GI symptoms, malaise, lethargy, myalgia, arthralgia, edema, shortness of breath, paresthesia, hypotension, death); fever.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- Anticipate oral candidiasis when HIV disease is reported.
- If GI side effects occur, consider semisupine chair position.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values improve above this level.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.

Oral Health Education

- Recommend frequent maintenance prophylaxis when immunosuppression is evident.
- Encourage daily plaque control procedures for effective self-care because HIV infection reduces host resistance.

abacavir sulfate/lamivudine (ab-ah-KAV-ear SULL-fate/la-MIH-view-deen)

Epzicom

Drug Class: Nucleoside analog reverse transcriptase inhibitor combination

PHARMACOLOGY

Action

Inhibits replication of HIV by incorporation into HIV DNA and producing incomplete, nonfunctional DNA.

Uses

Treatment of HIV-1 infection in combination with other antiretroviral agents.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

The following adverse reactions were reported during postapproval use of abacavir and lamivudine. Adverse reactions occurring with administration of either abacavir or lamivudine can be found listed in their respective monographs.

⚠ **ORAL:** Stomatitis.

CNS: Paresthesia; peripheral neuropathy; seizures.

RESP: Abnormal breath sounds/wheezing.

MISC: Sensitivity reactions (including anaphylaxis); redistribution/accumulation of body fat; weakness.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- Anticipate oral candidiasis when HIV disease is reported.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values improve above this level.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.

Oral Health Education

- Recommend frequent maintenance prophylaxis when immunosuppression is evident.
- Encourage daily plaque control procedures for effective self-care since HIV infection reduces host resistance.

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abacavir sulfate/lamivudine/zidovudine (ab-ah-KAV-ear SULL-fate/la-MIH-view-deen/zie-DOE-view-DEEN)

Trizivir

Drug Class: Antiretroviral combination

PHARMACOLOGY

Action

Inhibits replication of HIV by incorporation into HIV DNA and producing incomplete, nonfunctional DNA.

Uses

Use alone and in combination with other antiretroviral agents for the treatment of HIV-1 infection.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole: Possible zidovudine toxicity (decreased metabolism)
- Monitor clinical status.

Clarithromycin: Possible decreased zidovudine effect (mechanism unknown)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Stomatitis; oral mucosal pigmentation; candidiasis.

CNS: Loss of appetite; anorexia; insomnia; sleep disorders; headache; malaise; fatigue; neuropathy; dizziness; depression; paresthesia; peripheral neuropathy; seizures.

GI: Nausea; vomiting; diarrhea; pancreatitis; abdominal pain; dyspepsia.

RESP: Cough; abnormal breath sounds; wheezing.

MISC: Hypersensitivity; fever; chills; musculoskeletal pain; myalgia; arthralgia; vasculitis; weakness; muscle weakness; creatine phosphokinase elevation; rhabdomyolysis.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- Anticipate oral candidiasis when HIV disease is reported.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values improve above this level.

Oral Health Education

- Recommend frequent maintenance prophylaxis when immunosuppression is evident.
- Encourage daily plaque control procedures for effective self-care because HIV infection reduces host resistance.

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abatacept (ab-a-TA-sept)

Orencia

Drug Class: Immunologic agent

PHARMACOLOGY

Action

Decreases T-cell proliferation and inhibits the production of the cytokines tumor necrosis factor (TNF) alpha, interferon-γ, and interleukin-2.

Uses

Reducing signs and symptoms, inducing major clinical response, slowing the progression of structural damage, and improving physical function in adult patients with moderately to severely active rheumatoid arthritis who have had an inadequate response to 1 or more disease-modifying antirheumatic drugs (DMARDs). Abatacept may be used as monotherapy or with DMARDs other than TNF antagonists.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Herpes simplex (less than 5%).

CVS: Hypertension (7%).

CNS: Headache (18%); dizziness (9%).

GI: Nausea (at least 10%); dyspepsia (6%).

RESP: Respiratory disorders (including COPD exacerbation, cough, dyspnea, rhonchi [43%]); upper respiratory tract infection (at least 10%); bronchitis, sinusitis (5% to 13%); pneumonia (less than 5%); cough (8%).

MISC: Influenza (5% to 13%); pain in extremity (3%); acute infusion-related events (including dizziness, headache, hypertension [1% to 2%]); malignancies (including melanoma and myelodysplastic syndrome; and bile duct, bladder, breast, cervical, endometrial, lung, ovarian, prostate, renal, skin, thyroid, and uterine cancer) (1%).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse rate) and respiratory function.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education
- If hands are affected, determine need for power toothbrush for self-care.
- Recommend frequent maintenance prophylaxis when immunosuppression is evident.

absorbable gelatin sponge

Gelfoam: Sponges: Size 12: 2 × 6 cm × 3 or 7 mm, Size 50: 8 × 6.25 cm, Size 100: 8 × 12.5 cm, Size 200: 8 × 25 cm; Packs: Size 2: 40 × 2 cm, Size 6: 40 × 6 cm; Dental Pack: Size 4: 2 × 2 cm

Drug Class: Hematological agents, topical

PHARMACOLOGY

Action
Provides a matrix for fibrin deposition and propagation of blood clot to control capillary or venous hemorrhage. When implanted into tissues, it is absorbed completely within 4 to 6 wk without inducing excessive scar tissue formation. When applied to bleeding areas of nasal, rectal, or vaginal mucosa, it completely liquefies within 2 to 5 days.

Uses
For use in surgical procedures as an adjunct to hemostasis when control of bleeding by ligature or conventional procedures is ineffective or impractical. Also used in oral and dental surgery as an aid in providing hemostasis. In open prostatic surgery, insertion into the prostatic cavity provides hemostasis.

Contraindications
Closure of skin incisions (may interfere with the healing of skin edges); control of postpartum bleeding or menorrhalgia.

Usual Dosage
Local bleeding associated with oral surgical procedures

SPONGES, PACKS

ADULTS AND CHILDREN: Apply pack or sponge to bleeding site with moderate pressure (may be placed into a socket).

DRUG INTERACTIONS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Sponge may cause infection and abscess formation.

CNS: Giant cell granuloma in the brain has occurred at implantation site, as well as brain and spinal cord compression due to sterile fluid accumulation.

MISC: Excessive fibrosis and prolonged fixation of the tendon were seen when the sponge was used at a tendon juncture.

CLINICAL IMPLICATIONS

General
- Not recommended in the presence of infection. If signs of infection or abscess develop in the area where the sponge has been placed, reoperation may be necessary to remove the infected material and allow drainage.
- Sponge may expand and impinge on nearby structures. When placing into cavities or closed tissue spaces, use minimal preliminary compression; avoid overpacking.
- Once package is opened, contents are subject to contamination.
- Do not resterilize by heat, since heating may change absorption time. Ethylene oxide is not recommended for resterilization; it may be trapped in the interstices of the foam and trace amounts may cause burns or irritation to tissue.

Pregnancy Risk Category: Category C.

Oral Health Education
- Instruct patient to inform dentist if pain, swelling, or infection develops.

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acarbose (A-car-bose)

Precose

Prandase

Glucobay

Drug Class: Antidiabetic, alpha-glucosidase inhibitor

PHARMACOLOGY

Action
Inhibits intestinal enzymes that digest carbohydrates, thereby reducing carbohydrate digestion after meals. This lowers postprandial glucose elevation in diabetic patients.

Uses
Patients with type 2 diabetes mellitus who have failed dietary therapy. May be used alone or in combination with sulfonylureas, insulin, or metformin.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
GI: Flatulence (74%); diarrhea (31%); abdominal pain (19%).

CLINICAL IMPLICATIONS

General
- *Hypoglycemia:* Acarbose does not produce hypoglycemia; however, hypoglycemia may develop if used together with sulfonylureas or insulin.
- Determine degree of disease control and current blood sugar levels. A_1C levels $\geq$8% indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated.
- Monitor blood pressure, as hypertension and dyslipidemia (i.e., CAD) are prevalent in diabetes mellitus.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is $\geq$180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin or Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Observe for signs of hypoglycemia (e.g., confusion, argumentativeness, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose instead of cane sugar.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education
- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A_1C levels to dental appointments.
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

acebutolol HCl (ass-cee-BYOO-toe-lahl HIGH-droe-KLOR-ide)

Sectral

Apo-Acebutolol, Gen-Acebutolol, Gen-Acebutolol Type S, Monitan, Novo-Acebutolol, Nu-Acebutolol, Rhotral

Drug Class: Beta$_1$-adrenergic blocker

PHARMACOLOGY

Action

Blocks beta$_1$-receptors, primarily affecting heart (slows rate), vascular musculature (decreases BP), and lungs (reduces function).

Uses

Management of hypertension and premature ventricular contractions.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Nonsteroidal anti-inflammatory drugs: Decreased antihypertensive effect (inhibition of prostaglandin synthesis)

- Instruct patient to monitor blood pressure.

Sympathomimetic amines: Decreased antihypertensive effect with epinephrine (pharmacological antagonism)

- Monitor blood pressure. Use local anesthetic agents with vasoconstrictor with caution.

Hypertensive reactions with epinephrine (unopposed alpha-adrenergic stimulation)

- Increased epinephrine dosage may be required in anaphylaxis.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disturbance (rare).

CNS: Insomnia; fatigue; dizziness; depression; lethargy; drowsiness; forgetfulness.

CVS: Bradycardia; orthostatic hypotension (rare).

GI: Nausea; vomiting; diarrhea.

RESP: Bronchospasm; dyspnea; wheezing.

MISC: Thrombocytopenia, leukopenia (both rare).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Beta blockers may mask epinephrine-induced signs and symptoms of hypoglycemia in patients with diabetes.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

acetaminophen (ass-cet-ah-MEE-noe-fen)

Synonym: *n*-acetyl-p-aminophenol; APAP

Acephen, Aceta, Acetaminophen Uniserts, Apacet, Aspirin Free Anacin Maximum Strength, Aspirin Free Pain Relief, Children's Dynafed Jr., Children's Feverall, Children's Genapap, Children's Halenol, Children's Mapap, Children's Panadol, Children's Silapap, Children's Tylenol, Children's Tylenol Soft Chews, Dapacin, Extra Strength Dynafed E.X., Feverall, Feverall Junior Strength, Genapap, Genapap Infants' Drops, Genapap Extra Strength, Genebs, Genebs Extra Strength, Infants' Pain Reliever, Infants' Silapap, Liquiprin Drops for Children, Mapap Extra Strength, Mapap Infant Drops, Mapap Regular Strength, Maranox, Neopap, Oraphen-PD, Panadol, Panadol Infants' Drops, Redutemp, Ridenol, Tapanol Extra Strength, Tapanol Regular Strength, Tempra, Tempra 1, Tempra 2 Syrup, Tempra 3, Tylenol Arthritis, Tylenol Caplets, Tylenol Extended Relief, Tylenol Extra Strength, Tylenol Infants' Drops, Tylenol Junior Strength, Tylenol Regular Strength, Uni-Ace: Tablets: 325, 500 mg; Chewable tablets: 80, 120 mg; Gelcaps: 500 mg; Caplets: 325, 500, 650 mg; Solution: 80 mg/1.66 mL, 100 mg/mL, 160 mg/5 mL, 500 mg/15 mL; Elixir: 80 mg/2.5 mL, 80 mg/5 mL, 120 mg/5 mL, 160 mg/5 mL; Drops: 80 mg/0.8 mL; Suppositories: 80, 120, 125, 325, 650 mg

Abenol, Apo-Acetaminophen, Atasol, Pediatrix

Algitrin, Analphen, Andox, Cilag, Datril, Febrin, Magnidol, Minofen, Neodol, Neodolito, Sedalito, Sinedol, Sinedol 500, Temperal, Tempra, Tylex, Tylex 750, Winasorb

Drug Class: Analgesic; Antipyretic

PHARMACOLOGY

Action

Inhibits prostaglandins in CNS but lacks anti-inflammatory effects in periphery; reduces fever through direct action on hypothalamic heat-regulating center.

Uses

Relief of mild to moderate pain; treatment of fever.

Unlabeled Uses

Pain and fever prophylaxis after vaccination.

Usual Dosage

Oral

Adults: *PO:* 325 to 650 mg prn q 4 to 6 hr or 1 g 3 to 4 times/day. Do not exceed 4 g/day.
Children: *PO:* 10 to 15 mg/kg dose prn q 4 to 6 hr; do not exceed 5 doses/24 hr.

Suppositories

Adults: *PR:* 650 mg q 4 to 6 hr; do not exceed 6 suppositories/24 hr.
Children 3 to 6 yr: *PR:* 120 mg q 4 to 6 hr; do not exceed 720 mg/24 hr.
Children 6 to 12 yr: *PR:* 325 mg q 4 to 6 hr; do not exceed 2.6 g/24 hr.

Pharmacokinetics

ABSORP: Rapid and complete from the GI tract. T_{max} is 0.5 to 2 hr; 4 hr after overdosage.
DIST: Distributed throughout most body fluids. Binding to plasma proteins is variable.
METAB: Primarily metabolized by hepatic conjugation (94%); about 4% is metabolized by CYP450 oxidase to toxic metabolite.

EXCRET: $T_{1/2}$ is about 2 hr; 90% to 100% is recovered in the urine within the first day, primarily as inactive metabolites; 2% is excreted as unchanged drug.
SPECIAL POP: *Cirrhotic patients:* Half-life is slightly prolonged.

DRUG INTERACTIONS

Cholestyramine: Decreased acetaminophen effect (unknown mechanism)
- Administer acetaminophen 1 hr before cholestyramine.

Contraceptives, combination: Possible decreased analgesic effect (increased metabolism)
- Monitor analgesia.

Isoniazid: Acetaminophen toxicity (increase in toxic metabolites)
- Avoid concurrent use.

Phenytoin: Possible increased acetaminophen toxicity (increase in toxic metabolites)
- Avoid concurrent use.

Probenecid: Possible acetaminophen toxicity (decreased metabolism and renal excretion)
- Avoid concurrent use.

Sulfinpyrazone: Possible decreased acetaminophen effect (increased metabolism)
- Monitor analgesia.

ADVERSE EFFECTS

GI: Nausea, vomiting (<1%), hepatotoxicity (high doses).

CLINICAL IMPLICATIONS

General

- *Lactation:* Excreted in breast milk.
- *Hepatic failure:* Patients with chronic alcoholism should not exceed 2 g/day.
- *Persistent pain or fever:* May indicate serious illness. Consult health care provider.
- Obtain patient history, including drug history and any known allergies.
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *If used for arthritis:* Consider patient comfort and need for semisupine chair position.
- COX-1 inhibitors are the indicated analgesics for dental pain; use APAP when those cannot be used.

Pregnancy Risk Category: Category B.

Oral Health Education

- Instruct adult patient not to take drug more than 10 days for pain or 3 days for fever.

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acetaminophen/codeine phosphate (ass-cet-ah-MEE-noe-fen/KOE-deen FOSS-fate)

Synonym: codeine phosphate/acetaminophen

Aceta w/Codeine, Capital w/Codeine, Phenaphen w/Codeine No. 3, Phenaphen w/Codeine No. 4, Tylenol w/Codeine, Tylenol w/Codeine No. 2, Tylenol w/Codeine No. 3, Tylenol w/Codeine No. 4: Tablets: 15, 30, 60 mg codeine phosphate/300 mg APAP; Caplets: 30, 60 mg codeine phosphate/325 mg APAP; Elixir/Suspension: 12 mg codeine phosphate/120 mg APAP

Triatec-30, Tylenol Elixir with Codeine

Tylex CD

Drug Class: Narcotic analgesic combination

DEA Schedule: Schedule III

PHARMACOLOGY

Action

Inhibits synthesis of prostaglandins; binds to opiate receptors in CNS and peripherally blocks pain impulse generation; produces antipyresis by direct action on hypothalamic

heat-regulating center; causes cough suppression by direct central action in medulla; may produce generalized CNS depression; does not have significant anti-inflammatory or antiplatelet effects.

Uses

Relief of mild to moderate pain; analgesic-antipyretic therapy in presence of aspirin allergy, hemostatic disturbances, bleeding diatheses, upper GI disease, and gouty arthritis.

Contraindications

Hypersensitivity to codeine phosphate or similar compounds.

Usual Dosage

Tylenol No. 2 equals 15 mg codeine, 300 mg acetaminophen. Tylenol No. 3 equals 30 mg codeine, 300 mg acetaminophen. Tylenol No. 4 equals 60 mg codeine, 300 mg acetaminophen.

Max adult dose: Codeine equals 360 mg/day; acetaminophen equals 4 g/day.

Orodental Pain

Tablets, Caplets

Adults: *PO:* Usually 1 to 2 tablets q 4 hr (varies according to product).
Children under 12 yr: *PO:* 0.5 to 1 mg codeine/kg/dose q 4 to 6 hr; 10 to 15 mg acetaminophen/kg/dose q 4 hr to max 2.6 g/24 hr.

Elixir/Suspension

Children older than 12 yr: *PO:* 15 mL q 4 hr.
Children 7 to 12 yr: *PO:* 10 mL tid to qid.
Children 3 to 6 yr: *PO:* 5 mL tid to qid.

Pharmacokinetics

Acetaminophen

ABSORP: Rapid and complete from the GI tract. T_{max} is 0.5 to 2 hr; 4 hr after overdosage.

DIST: Distributed throughout most body fluids. Binding to plasma proteins is variable.

METAB: Primarily metabolized by hepatic conjugation (94%); about 4% is metabolized by CYP450 oxidase to toxic metabolite.

EXCRET: $T_{1/2}$ is about 2 hr; 90% to 100% is recovered in the urine within the first day, primarily as inactive metabolites; 2% is excreted as unchanged drug.

Codeine

METAB: Metabolized in the liver by undergoing *O*-demethylation, *N*-demethylation, and partial conjugation.

EXCRET: Excreted in the urine, largely as inactive metabolites, and small amounts of free and conjugated morphine. The $t_{1/2}$ is 3 hr.

ONSET: *Oral/SC*: 15 to 30 min.

PEAK: *Oral*: 60 min.

DURATION: *Oral/SC*: 4 to 6 hr.

DRUG INTERACTIONS

See also: acetaminophen – Drug interactions

Cimetidine: Severe opioid toxicity (decreased metabolism)
- Use with caution.

Bupivacaine: Possible respiratory depression (mechanism unknown)
- Avoid concurrent use.

Paroxetine: Lack of analgesic activity (blocks the conversion of codeine to morphine)
- Avoid concurrent use.

Quinidine: Lack of analgesic activity (blocks the conversion of codeine to morphine)
- Avoid concurrent use.

Rifampin: Possible decreased efficacy of codeine (mechanism unknown)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CVS: Flushing; orthostatic hypotension.

CNS: Lightheadedness; dizziness; sedation; euphoria; insomnia; disorientation; incoordination.

GI: Nausea; vomiting; constipation; abdominal pain.

RESP: Dyspnea; respiratory depression; decreased cough reflex.

MISC: Histamine release.

CLINICAL IMPLICATIONS

General

When prescribed by DDS:

- *Lactation:* Excreted in breast milk.
- *Hepatic failure:* Acetaminophen intake must be limited to 2 g/day or less.
- *Sulfite sensitivity:* Caution is needed with sulfite-sensitive patients; some commercial preparations contain sodium bisulfite.
- *Overdosage:* Blood dyscrasias, respiratory depression, hepatic damage (may occur up to several days after overdose).
- Obtain patient history, including drug history and any known allergies. Note pulmonary or hepatic disease, alcoholism, head injury, Addison disease, hypothyroidism, or previous addiction to narcotic drugs.
- Assess baseline level of pain before prescribing.
- Consider related factors that may lower pain threshold (e.g., anxiety, fear, boredom, environmental stressors).
- Administer scheduled dose before pain becomes severe.

When prescribed by medical facility:

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Pregnancy Risk Category: Category C.

Oral Health Education

When prescribed by DDS:

- Caution patient that drug dependency or tolerance may result from long-term use.
- Caution patient to avoid intake of alcohol and other CNS depressants without consulting health care provider.
- Advise patient that drug may cause drowsiness and to use caution while driving or performing other tasks requiring mental alertness.
- Instruct patient to notify health care provider if the following signs/symptoms occur: persistence or recurrence of pain before next scheduled dose; difficulty breathing; blurred vision; increased drowsiness; severe nausea; vomiting; urinary retention; yellowing of skin, sclera, or gums.
- Warn patient that orthostatic hypotension may occur; instruct patient to change positions slowly and to sit or lie down if symptoms occur.
- Explain that diaphoresis is a common side effect and does not indicate a problem.
- Warn patient that constipation may occur. Advise patient to increase dietary fiber and fluids unless contraindicated.
- Caution patient against taking OTC medications that contain acetaminophen.

When prescribed by medical facility:

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

acetaminophen/hydrocodone bitartrate (ass-eet-ah-MEE-noe-fen/HIGH-droe-KOE-dohn by-TAR-trate)

Synonym: hydrocodone bitartrate/acetaminophen

Anexsia 5/500, Duocet, Duradyne DHC, Hy-Phen, Lortab 5/500, Margesic H, Panacet 5/500, Vicodin: Tablets: 5 mg hydrocodone bitartrate/500 mg acetaminophen
Anexsia 7.5/650, Lorcet Plus: Tablets: 7.5 mg hydrocodone bitartrate/650 mg acetaminophen
Anexsia 10/660, Vicodin HP: Tablets: 10 mg hydrocodone bitartrate/660 acetaminophen
Bancap-HC, Ceta-Plus, Co-Gesic, Dolacet, Hydrocet, Hydrogesic, Lorcet-HD, Stagesic, T-Gesic: Capsules: 5 mg hydrocodone bitartrate/500 mg acetaminophen
Lorcet 10/650: Tablets: 10 mg hydrocodone bitartrate/650 mg acetaminophen
Lortab 7.5/500: Tablets: 7.5 mg hydrocodone bitartrate/500 mg acetaminophen
Lortab 10/500: Tablets: 10 mg hydrocodone bitartrate/500 mg acetaminophen
Norco: Tablets: 10 mg hydrocodone bitartrate/325 mg acetaminophen
Vicodin ES: Tablets: 7.5 mg hydrocodone bitartrate/750 mg acetaminophen
Zydone: Tablets: 7.5 mg hydrocodone bitartrate/400 mg acetaminophen, 10 mg hydrocodone bitartrate/400 mg acetaminophen

Drug Class: Narcotic analgesic

DEA Schedule: Schedule III

PHARMACOLOGY

Action

Inhibits synthesis of prostaglandins and binds to opiate receptors in CNS and peripherally blocks pain impulse generation; produces antipyresis by direct action on hypothalamic heat-regulating center; causes cough suppression by direct central action in medulla; may produce generalized CNS depression.

Uses

Management of mild to moderate pain.

Contraindications

Hypersensitivity to acetaminophen, hydrocodone, or similar compounds.

Usual Dosage

Varies according to product and strength.
ADULTS: *PO:* 1 to 2 tablets or capsules (hydrocodone 2.5 to 10 mg; acetaminophen 500 to 1000 mg) q 4 to 6 hr or 5 to 10 mL (elixir, 15 mL) q 4 to 6 hr.
CHILDREN (YOUNGER THAN 12 YR): *PO:* 10 to 15 mg acetaminophen/kg/dose q 4 hr to max of 2.6 g/24 hr.

Pharmacokinetics

Acetaminophen
ABSORP: Rapid and complete from the GI tract. T_{max} is 0.5 to 2 hr; 4 hr after overdosage.
DIST: Distributed throughout most body fluids. Binding to plasma proteins is variable.
METAB: Primarily metabolized by hepatic conjugation (94%); about 4% is metabolized by CYP450 oxidase to toxic metabolite.
EXCRET: $T_{1/2}$ is about 2 hr; 90% to 100% is recovered in the urine within the first day, primarily as inactive metabolites; 2% is excreted as unchanged drug.

Hydrocodone
ABSORP: Hydrocodone is rapidly absorbed from the GI tract. T_{max} is achieved at 1.7 hr.
DIST: Distributed throughout the body. Not extensively protein bound.

METAB: Extensively metabolized in the liver to hydromorphone by *O*-demethylation by the CYP2D6 isoenzyme.
EXCRET: Hydrocodone and its metabolites are eliminated primarily in the kidneys.
ONSET: 30 min.
PEAK: 1.7 hr.
DURATION: 4.5 hr.
SPECIAL POP: *Severe renal insufficiency:* The effect of renal insufficiency on the pharmacokinetics of hydrocodone has not been determined.

DRUG INTERACTIONS

See also: acetaminophen — Drug Interactions
No specific documented drug-drug interactions with hydrocodone. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CVS: Hypotension; bradycardia.
CNS: Lightheadedness; dizziness; sedation; drowsiness; weakness; anxiety; fear; fatigue; dysphoria; psychological dependence; confusion.
GI: Nausea; vomiting; constipation.
RESP: Dyspnea; respiratory depression; irregular breathing.

CLINICAL IMPLICATIONS

General

When prescribed by DDS:
- *Lactation:* Excreted in breast milk.
- *Children:* Safety and effectiveness in children have not been established.
- *Hepatic failure:* Patients with chronic alcoholism should limit acetaminophen intake to less than 2 g/day.
- *Special risk:* Closely monitor elderly, debilitated patients, and those with conditions accompanied by hypoxia or hypercapnia to avoid decrease in pulmonary ventilation. Also use caution in patients sensitive to CNS depressants. Because of cough suppressant effects, exercise caution when using postoperatively or in patients with pulmonary disease.
- *Sulfite sensitivity:* Use caution in sulfite-sensitive individuals; some commercial preparations contain sodium bisulfite.
- *Overdosage:* Blood dyscrasias, respiratory depression, and hepatic necrosis (all may occur up to several days after overdose); renal tubular necrosis, hypoglycemic coma, nausea, vomiting, diaphoresis, malaise, somnolence, skeletal muscle flaccidity, bradycardia, hypotension, apnea, cardiac arrest.
- Monitor for orthostatic hypotension and supervise ambulation.
- Encourage coughing and deep breathing in patients with pulmonary problems.
- Check for reduced dosage if another CNS depressant medication is being administered concurrently.

When prescribed by medical facility:
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs.

Pregnancy Risk Category: Category C.

Oral Health Education

When prescribed by DDS:
- Instruct patient to take before pain becomes severe.
- Advise patient to take with food or milk.
- When medication is being used for acute pain, advise patient of possible addiction and explain that drug should be used for the short term only.
- Advise patient to change position slowly and to use caution when ambulating and performing other activities requiring mental alertness, such as driving or operating machinery.

- Instruct patient to eat high-fiber diet, maintain adequate fluid intake, and use stool softener or bulk laxative to prevent constipation.
- Advise patient to avoid alcohol and any other drug that causes drowsiness, such as sleeping aids and antihistamines.
- Instruct patient to discontinue drug and notify health care provider if blurred vision, rash, or yellowing of skin occurs.
- If lightheadedness, dizziness, drowsiness, nausea, or vomiting occurs, advise patient to lie down until symptoms subside and to notify health care provider if symptoms persist.

acetaminophen/oxycodone HCl (ass-cet-ah-MEE-noe-fen/OX-ee-KOE-dohn HIGH-droe-KLOR-ide)

Synonym: oxycodone HCl/acetaminophen

Percocet: Tablets: 5 mg oxycodone HCl/325 mg acetaminophen, 7.5 mg oxycodone HCl/500 mg acetaminophen, 10 mg oxycodone HCl/650 mg acetaminophen
Roxicet: Tablets: 5 mg oxycodone HCl/325 mg acetaminophen; Solution, oral: 5 mg oxycodone HCl/325 mg acetaminophen
Roxicet 5/500: Caplets: 5 mg oxycodone/500 mg acetaminophen
Roxilox: Capsules: 5 mg oxycodone HCl/500 mg acetaminophen
Tylox: Capsules: 5 mg oxycodone HCl/500 mg acetaminophen

Percocet-Demi, **ratio-Oxycocet**

Drug Class: Narcotic analgesic combination

DEA Schedule: Schedule II

PHARMACOLOGY

Action

Acetaminophen inhibits synthesis of prostaglandins centrally and peripherally blocks pain impulse generation, whereas oxycodone binds to opiate receptors in the CNS. Combination has synergistic effect in alleviating pain.

Uses

Relief of moderate to moderately severe pain.

Contraindications

Hypersensitivity to acetaminophen, oxycodone, or similar compounds.

Usual Dosage

ADULTS: *PO:* 5 mg (1 tablet, caplet, or teaspoonful) q 6 hr prn.

Pharmacokinetics

Acetaminophen

ABSORP: Rapid and complete from the GI tract. T_{max} is 0.5 to 2 hr; 4 hr after overdosage.

DIST: Distributed throughout most body fluids. Binding to plasma proteins is variable.

METAB: Primarily metabolized by hepatic conjugation (94%); about 4% is metabolized by CYP450 oxidase to toxic metabolite.

EXCRET: $T_{1/2}$ is about 2 hr; 90% to 100% is recovered in the urine within the first day, primarily as inactive metabolites; 2% is excreted as unchanged drug.

Oxycodone

ABSORP: High oral availability due to low presystemic or first-pass metabolism. Exhibits a biphasic absorption pattern. The immediate-release oral bioavailability is 100%. The oral bioavailability is 60% to 87%. Peak plasma concentration increased by 25% with a high-fat meal. Once absorbed, it is distributed to skeletal muscle, liver, intestinal tract, lungs, spleen, and brain.

DIST: The Vd is 2.6 L/kg (IV). It is found in breast milk.

METAB: Extensively metabolized in the liver to noroxycodone (a major metabolite), oxymorphone, and their glucuronides.

EXCRET: Excreted through the urine, with less than 19% as free oxycodone, less than 50% as conjugated oxycodone, and less than 14% as conjugated oxymorphone. The $t_{1/2}$ for immediate release is 0.4 hr. Clearance is 0.8 L/min. Elimination on $t_{1/2}$ is 3.2 hr (immediate release).

ONSET: 15 to 30 min.

PEAK: 1 hr.

DURATION: 4 to 6 hr.

SPECIAL POP: *Severe renal insufficiency:* For less than 60 mL/min, higher peak plasma oxycodone (50%), and noroxycodone (20%), higher AUC for oxycodone (60%), noroxycodone (50%), oxymorphone (40%). There is an increased $t_{1/2}$ of oxycodone elimination of only 1 hr.

Mild to moderate hepatic insufficiency: Peak plasma oxycodone and noroxycodone concentrations 50% and 20% higher; AUC values are 95% and 65% higher, respectively. Oxymorphone peak plasma concentration and AUC values are lower by 30% and 40%. The $t_{1/2}$ elimination for oxycodone is increased by 2.3 hr.

DRUG INTERACTIONS

See also: acetaminophen — Drug Interactions

Sertraline: Possible increased risk of serotonin syndrome (mechanism unknown)

- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CVS: Hypotension; bradycardia; tachycardia.

CNS: Lightheadedness; dizziness; weakness; fatigue; sedation; euphoria; dysphoria; nervousness; headache; confusion.

GI: Nausea; vomiting; constipation; abdominal pain; anorexia; biliary spasm.

RESP: Dyspnea; respiratory depression.

MISC: Malaise; tolerance; psychological and physical dependence with long-term use.

CLINICAL IMPLICATIONS

General

When prescribed by DDS:

- Short-term use only; there is no justification for long-term use in the management of dental pain.
- *Lactation:* Undetermined.
- *Children:* Safety and efficacy not established.
- *Hepatic failure:* Patients with chronic alcoholism should limit acetaminophen intake to less than 2 g/day.
- *Special risk:* Use with caution in elderly, debilitated patients and those with hepatic or kidney failure or conditions accompanied by hypoxia or hypercapnia; monitor carefully to avoid decrease in pulmonary ventilation. Also use cautiously in patients sensitive to CNS depressants, in all patients postoperatively, and in patients with pulmonary disease.
- *Sulfite sensitivity:* Use with caution in patients known to be sensitive, as some products contain bisulfites.
- *Dependence:* Can produce drug dependence; has abuse potential.
- *Overdosage:* Miosis, respiratory depression, CNS depression (somnolence progressing to stupor or coma), hepatic damage, circulatory collapse, cardiopulmonary arrest, death.

When prescribed by medical facility:

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Pregnancy Risk Category: Category C.

Oral Health Education

When prescribed by DDS:

- Instruct patient to take medication before pain becomes severe for greatest effectiveness.
- Teach patient methods to prevent constipation.
- Instruct patient to make position changes slowly if lightheadedness or sedation occurs.
- Advise patient to avoid intake of alcoholic beverages or products containing alcohol while using this medication.
- Advise patient that drug may cause drowsiness, and to use caution while driving or performing other tasks requiring mental alertness.
- Caution patient that physical dependency and withdrawal symptoms may occur following discontinuation of long-term therapy.
- Instruct patient not to take any OTC medications without consulting health care provider.

When prescribed by medical facility:

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

acetaminophen/propoxyphene (ass-cet-ah-MEE-noe-fen/pro-POX-ee-feen)

(acetaminophen/propoxyphene HCl, acetaminophen/propoxyphene napsylate)

Synonym: propoxyphene/acetaminophen; propoxyphene HCl/acetaminophen; propoxyphene napsylate/acetaminophen

Darvocet A500, Darvocet-N 100, Darvocet-N 50

Drug Class: Narcotic analgesic combination

DEA Schedule: Schedule III

PHARMACOLOGY

Action

Propoxyphene relieves pain by stimulating opiate receptors in CNS; causes respiratory depression, peripheral vasodilation, inhibition of intestinal peristalsis, sphincter of hepatopancreatic ampulla spasm, stimulation of receptors that cause vomiting, and increased bladder tone. Acetaminophen inhibits synthesis of prostaglandins; does not have significant anti-inflammatory effects or antiplatelet effects; produces antipyresis by direct action on the hypothalamic heat-regulating center.

Uses

Relief of mild to moderate pain; as analgesic-antipyretic in presence of aspirin allergy, hemostatic disturbances, bleeding diatheses, upper GI disease, and gouty arthritis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Alprazolam: Possible alprazolam toxicity with propoxyphene (decreased metabolism)

- Avoid concurrent use.

Diazepam: Possible diazepam toxicity with acetaminophen (mechanism unknown)

- Avoid concurrent use.

ADVERSE EFFECTS

CNS: Lightheadedness; weakness; fatigue; sedation; dizziness; disorientation; incoordination; paradoxical excitement; euphoria; dysphoria; insomnia; headache; hallucinations.
GI: Nausea; vomiting; constipation; anorexia; abdominal pain; biliary spasm.
RESP: Dyspnea; depression of cough reflex.
MISC: Tolerance; psychological and physical dependence with long-term use; histamine release; skin rashes.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.

- If GI side effects occur, consider semisupine chair position.
- If oral pain requires additional analgesics, consider nonopioid products.

acetaminophen/tramadol HCl (ass-cet-ah-MEE-noe-fen/TRAM-uh-dole HIGH-droe-KLOR-ide)

Synonym: tramadol HCl/acetaminophen

Ultracet: Tablets: 325 mg acetaminophen/37.5 mg tramadol HCl

Drug Class: Nonnarcotic analgesic combination

PHARMACOLOGY

Action

TRAMADOL: Exact mechanism is unknown; however, it binds to certain opioid receptors and inhibits reuptake of norepinephrine and serotonin.

ACETAMINOPHEN: Inhibits prostaglandin in CNS and reduces fever through direct action on hypothalamic heat-regulating center.

Uses

Short-term (≤5 days) management of acute pain.

Contraindications

Any situation in which opioids are contraindicated, including acute intoxication with any of the following: alcohol, hypnotics, narcotics, centrally acting analgesics, opioids, or psychotropic drugs; hypersensitivity to any component of the product or opioids.

Usual Dosage

ADULTS: *PO:* 2 tablets (37.5 mg tramadol/325 mg acetaminophen/tablet) q 4 to 6 hr (max 8 tablets/day). In patients with Ccr less than 30 mL/min, it is recommended that the dosing interval be increased not to exceed 2 tablets q 12 hr.

Pharmacokinetics

ABSORP: The absolute bioavailability of tramadol after administration of a single 100-mg dose is approximately 75%. The mean peak plasma concentration of racemic tramadol occurs at approximately 2 hr. Oral absorption of acetaminophen occurs primarily in the small intestine. Peak concentrations of acetaminophen occur within 1 hr.

DIST: The Vd of tramadol is 2.6 and 2.9 L/kg in men and women, respectively, following IV administration of 100 mg. Tramadol is approximately 20% protein bound. Acetaminophen is widely distributed throughout the body tissue except fat. The Vd is approximately 0.9 L/kg. Less than 20% is bound to plasma protein.

METAB: Tramadol is extensively metabolized in the liver by a number of pathways, including CYP2D6 and 3A4, as well as by conjugation. The *O*-desmethyltramadol metabolite is pharmacologically active. Plasma levels of tramadol are approximately 20% higher in poor metabolizers (CYP2D6) compared with extensive metabolizers. Acetaminophen is primarily metabolized in the liver. In adults, most acetaminophen is conjugated with glucuronic acid and is not active. In premature infants, newborns, and young infants, the predominant metabolite is the sulfate conjugate.

EXCRET: Approximately 30% of the tramadol dose is excreted unchanged in the urine and 60% is excreted as metabolites. The plasma elimination $t_{1/2}$ of tramadol and the active metabolite are approximately 5 to 6 hr and 7 hr, respectively. The apparent $t_{1/2}$ of racemic tramadol increases to 7 to 9 hr with multiple dosing. The $t_{1/2}$ of acetaminophen is approximately 2 to 3 hr in adults and somewhat less in children, while being somewhat longer in neonates and patients with cirrhosis. Acetaminophen is eliminated in the urine, primarily as metabolites (less than 9% excreted unchanged).

SPECIAL POP: Use in patients with hepatic impairment is not recommended. Clearance of tramadol is 20% higher in women compared with men.

DRUG INTERACTIONS

See also: acetaminophen — Drug Interactions

Antidepressants, tricyclic: Increased risk of seizure (additive proconvulsant effect)
- Avoid concurrent use.

Carbamazepine: Decreased tramadol effect (increased metabolism)
- Avoid concurrent use.

Citalopram: Increased risk of seizure (additive proconvulsant effect)
- Avoid concurrent use.

Fluoxetine: Increased risk of seizure (additive proconvulsant effect)
- Avoid concurrent use.

Increased risk of serotonin syndrome (additive serotonin effect)
- Avoid concurrent use.

Fluvoxamine: Increased risk of seizure (additive proconvulsant effect)
- Avoid concurrent use.

Monoamine oxidase inhibitors: Increased risk of serotonin syndrome (reduced uptake of monoamines)
- Avoid concurrent use.

Olanzapine: Possible increased risk of serotonin syndrome (mechanism not established)
- Monitor clinical status.

Ondansetron: Possible decreased tramadol analgesia (serotonin antagonism)
- Monitor clinical status.

Paroxetine: Increased risk of seizure (additive proconvulsant effect)
- Avoid concurrent use.

Increased risk of serotonin syndrome (additive serotonin effect)
- Avoid concurrent use.

Sertraline: Increased risk of serotonin syndrome (additive serotonin effect)
- Avoid concurrent use.

Warfarin: Bleeding into skin (mechanism unknown)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CVS: Hypertension; hypotension; arrhythmia; palpitation; tachycardia.

CNS: Somnolence; anorexia; insomnia; dizziness; headache; tremor; anxiety; confusion; euphoria; nervousness; amnesia; hallucination.

GI: Constipation; diarrhea; nausea; abdominal pain; dyspepsia; flatulence; vomiting.

RESP: Dyspnea.

MISC: Asthenia; fatigue; hot flushes; allergic reactions.

CLINICAL IMPLICATIONS

General

When prescribed by DDS:
- Short-term use only; there is no justification for long-term use in the management of dental pain.
- *Lactation:* Undetermined.
- *Children:* Safety and efficacy not established.
- *Elderly:* Use with caution, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, and concomitant disease and multiple drug therapy.
- *Anaphylactoid reactions:* Serious and rarely fatal anaphylactoid reactions may occur.
- *Dependence:* Morphine-like psychic and physical dependence may occur with tramadol.
- *Hepatic disease:* Use is not recommended in patients with hepatic impairment.
- *Respiratory depression:* Use with caution in patients at risk of respiratory depression.
- *Seizures:* May occur.
- *Withdrawal:* Symptoms (e.g., anxiety, sweating, insomnia, rigors, pain, tremors) may occur if tramadol is discontinued abruptly.

- *Overdosage:* TRAMADOL: Respiratory depression, seizures, lethargy, coma, cardiac arrest, death. ACETAMINOPHEN: Anorexia, nausea, vomiting, malaise, pallor, diaphoresis, hepatic centrilobular necrosis (leading to hepatic failure and death), renal tubular necrosis, hypoglycemia, coagulation defects.

Pregnancy Risk Category: Category C.

Oral Health Education

When prescribed by DDS:

- Explain name, dose, action, and potential side effects of drug.
- Advise patient to take 2 tablets q 4 to 6 hr if needed for pain but not to take more than 8 tablets in 24 hr.
- Advise patient to take without regard to meals but to take with food if GI upset occurs.
- Caution patient to not take more tablets than prescribed or more frequently than prescribed. Serious toxicity may develop if prescribed dose is exceeded or doses are taken too close together.
- Advise patient that medication is for short-term use (≤5 days) only and, if symptoms persist, to contact health care provider regarding other therapies for pain control.
- Instruct patient to avoid taking acetaminophen or other acetaminophen-containing products, tramadol, or other tramadol-containing products.
- Instruct patient to avoid alcoholic beverages and other depressants while taking this medication.
- Advise patient that drug may impair judgment, thinking, or motor skills or cause dizziness and to use caution while driving or performing other tasks requiring mental alertness until tolerance is determined.
- Advise women to inform health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Warn patient not to take any prescription or OTC drugs or dietary supplements without consulting health care provider.
- Advise patient that follow-up visits may be necessary to monitor therapy and to keep appointments.

When prescribed by medical facility:

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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acetazolamide (uh-seet-uh-ZOLE-uh-mide)

Acetazolamide, Diamox, Diamox Sequels, Dazamide

APO-Acetazolamide

Acetadiazol

Drug Class: Anticonvulsant; Carbonic anhydrase inhibitor

PHARMACOLOGY

Action

Inhibits carbonic anhydrase enzyme, reducing rate of aqueous humor formation and thus lowering IOP; produces diuretic effect; retards neuronal conduction in brain.

Uses

Prevention or lessening of symptoms associated with acute mountain sickness (tablet only); adjunctive treatment of chronic simple (open-angle) glaucoma and secondary glaucoma; preoperative treatment of acute congestive (closed-angle) glaucoma; adjunctive treatment of (1) edema caused by CHF or drug-induced edema and (2) centrencephalic epilepsies (e.g., petit mal, generalized seizures).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

Drug Lab

False-positive urinary protein results may occur because of alkalinization of urine.

ADVERSE EFFECTS

⚠ **ORAL:** Metallic taste (<10%).
CNS: Drowsiness; confusion; sensory disturbances, including paresthesia and loss of appetite; convulsions.
GI: Nausea; vomiting; diarrhea; melena.
MISC: Flaccid paralysis; fever; flank or loin pain; severe adverse reactions associated with sulfonamides, including Stevens-Johnson syndrome and toxic epidermal necrolysis; photosensitivity.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Epilepsy:* Determine degree of disease control, type and frequency of seizure, and ensure that medication has been taken.
- Refer to the section entitled "The Patient Taking an Anticonvulsant" in Chapter 6: *Clinical Medicine*.
- *Glaucoma:* Direct dental light out of patient's eyes and offer dark glasses for comfort.

Oral Health Education

- Caution that taste perception may be altered during treatment.
- Inform patient of the danger of severe sunburn with this drug.

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acetohexamide (uh-seet-toe-HEX-uh-mide)

Dymelor

Dimelor

Drug Class: Antidiabetic, sulfonylurea

PHARMACOLOGY

Action

Decreases blood glucose levels by stimulating release of insulin from pancreas.

Uses

Adjunctive therapy, used with dietary modification, in patients with type 2 diabetes mellitus for lowering blood glucose level.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Azole antifungal agents: Severe hypoglycemia (decreased metabolism of acetohexamide)
- Avoid concurrent use.

ADVERSE EFFECTS

CNS: Dizziness; vertigo.
GI: Nausea; epigastric fullness; heartburn; cholestatic jaundice (rare).
MISC: Disulfiram-like reaction; weakness; paresthesia; fatigue; malaise; photosensitivity; hypoglycemia.

CLINICAL IMPLICATIONS

General

- Determine degree of disease control and current blood sugar levels. A_1C levels ≥8% indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of patients with diabetes is not indicated.
- Monitor blood pressure, as hypertension and dyslipidemia (CAD) are prevalent in diabetes mellitus. Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin or Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.

- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Observe for signs of hypoglycemia (e.g., confusion, argumentativeness, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- Prescribe drugs with photosensitization side effect with caution due to additive adverse effects.
- *Elderly:* Particularly susceptible to hypoglycemic effects of drug.
- *Disulfiram-like syndrome:* Alcohol may cause facial flushing and breathlessness.
- *Hypoglycemia:* May be difficult to recognize in elderly patients or in patients receiving beta-blockers.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A_1C levels to dental appointments.
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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acitretin (ASS-ih-TREH-tin)

Soriatane

Drug Class: Retinoid

PHARMACOLOGY

Action

Unknown.

Uses

Treatment of severe psoriasis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Tetracyclines: Increased intracranial pressure (mechanism unknown)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry, chapped lips (>75%); dry mouth (10% to 25%); tongue disorders, stomatitis, ulcerative stomatitis, gingival bleeding, gingivitis, increased salivation, thirst, taste disorder (1% to 10%).

CNS: Rigors (10% to 25%); headache, pain, depression, insomnia, somnolence (1% to 10%); myopathy with peripheral neuropathy, aggressive feelings and/or suicidal thoughts (postmarketing).

GI: Abdominal pain, diarrhea, nausea (1% to 10%).

MISC: Increased triglycerides (50% to 75%); increased CPK, fasting blood glucose (25% to 50%); decreased fasting blood sugar, high occult blood (10% to 25%); anorexia, edema, fatigue, hot flashes, increased appetite, photophobia, infection, decreased and increased iron, flushing (1% to 10%).

CLINICAL IMPLICATIONS

General

- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Advise products for palliative relief of oral manifestations (e.g., stomatitis, cheilitis, xerostomia).
- If GI side effects occur, consider semisupine chair position.
- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

acyclovir (A-SIKE-low-vihr)

Acyclovir: Injection: 50 mg/mL (as sodium); Powder for injection: 500 mg/vial (as sodium); Powder for injection: 1,000 mg/vial (as sodium)
Zovirax: Tablets: 400, 800 mg; Capsules: 200 mg; Suspension: 200 mg per 5 mL; Powder for injection, lyophilized: 500 mg/vial (as sodium), 1,000 mg/vial (as sodium); Ointment: 5%; Cream: 5%

Apo-Acyclovir, Gen-Acyclovir, Nu-Acyclovir

Acifur, Cicloferon, Isavir, Laciken, Opthavir

Drug Class: Anti-infective; Antiviral

PHARMACOLOGY

Action

Inhibits viral DNA replication by interfering with viral DNA polymerase.

Uses

PARENTERAL: Treatment of initial or recurrent mucosal and cutaneous herpes simplex viruses (HSV) and varicella zoster infections (shingles) in immunocompromised patients; treatment of HSV-related encephalitis; treatment of severe initial clinical episodes of genital herpes; and treatment of neonatal herpes infections.
ORAL: Treatment of initial and recurrent episodes of genital herpes in certain patients; acute treatment of shingles and chickenpox.
TOPICAL: Treatment of initial episodes of herpes genitalis and non–life-threatening mucotaneous HSV infections in immunocompromised patients (ointment); recurrent herpes labialis (cold sores) (cream).

Unlabeled Uses

Treatment of cytomegalovirus and HSV infection after bone marrow or renal transplant; treatment of infectious mononucleosis, varicella pneumonia, chickenpox, and other HSV infections.

Contraindications

Hypersensitivity to acyclovir or valacyclovir.

Usual Dosage

PARENTERAL

For IV infusion only; rapid or bolus IV must be avoided.

Herpes simplex infections in immunocompromised patients

ADULTS AND ADOLESCENTS 12 YR OF AGE AND OLDER: *IV:* 5 mg/kg infused at a constant rate over 1 hr q 8 hr for 7 days.
CHILDREN YOUNGER THAN 12 YR OF AGE: *IV:* 10 mg/kg infused at a constant rate over 1 hr q 8 hr for 7 days.

ORAL

Chickenpox

ADULTS AND CHILDREN (GREATER THAN 40 KG): *PO:* 800 mg qid for 5 days.
CHILDREN 2 YR AND OLDER (40 KG OR LESS): *PO:* 20 mg/kg qid for 5 days.

Herpes zoster

ADULTS: *PO:* 800 mg q 4 hr 5 times/day for 7 to 10 days.

TOPICAL

Recurrent herpes labialis (cold sores)

ADULTS AND CHILDREN 12 YR OF AGE AND OLDER: *Cream:* Apply to lesion 5 times/day for 4 days.

Pharmacokinetics

ABSORP: *Oral:* Bioavailability is 10% to 20%. C_{max} is 0.83 to 1.61 mcg/mL (200 to 800 mg at steady state). *IV:* C_{max} is 9.8 mcg/mL (5-mg/kg dose), 22.9 mcg/mL (10 mg/kg). *Topical:* Systemic absorption is minimal.

DIST: 9% to 33% protein bound. *IV:* CSF concentrations are about 50% of plasma values.

METAB: Liver.

EXCRET: The $t_{1/2}$ is 2.5 to 3.3 hr. Cl and $t_{1/2}$ are dependent on renal function.

SPECIAL POP: *Renal failure:* Total body Cl and $t_{1/2}$ are dependent on renal function. Dosage adjustment recommended.
Elderly: Increased plasma concentrations. Dosage adjustment may be required.

DRUG INTERACTIONS

Meperidine: Possible meperidine toxicity (decreased renal excretion)
- Monitor clinical status.

Zidovudine: Severe drowsiness and lethargy (mechanism unknown)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Burning, stinging (>10%); itching (topical cream).

CVS: Phlebitis at injection site (9%); hypotension.

CNS: Headache; agitation; coma; confusion; delirium; dizziness; hallucinations; obtundation; psychosis; seizure; somnolence.

GI: Nausea, vomiting (7%); diarrhea; GI distress; abdominal pain.

MISC: Anaphylaxis; fever; pain; peripheral edema thrombocytopenic purpura (immunocompromised patient).

CLINICAL IMPLICATIONS

General

- *Lactation:* Excreted in breast milk.
- *Children:* ORAL: Safety and efficacy in children younger than 2 yr of age not established. TOPICAL: Safety and efficacy not established in pediatric patients.
- *Elderly:* Use with caution because of the greater frequency of decreased hepatic, renal, or cardiac function, and concomitant diseases or other drug therapy.
- *Renal failure:* Dosage adjustment may be needed. With parenteral use, acyclovir may precipitate as crystals in renal tubules.
- *Cutaneous use:* Care must be taken to avoid getting drug in eyes.
- *Encephalopathic changes:* Patients with underlying neurological abnormalities or severe hypoxia may have increased risk of neurotoxic effects.
- *Thrombotic thrombocytopenic purpura/hemolytic uremic syndrome:* May occur and has resulted in death in immunocompromised patients.
- *Overdosage:* Increased BUN and serum creatinine, renal failure, convulsions, lethargy, acyclovir precipitation, renal tubules, agitation, coma.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Pregnancy Risk Category: Category B.

Oral Health Education

When prescribed by DDS:
- Explain name, dose, action, and potential side effects of drug.

Topical
- Advise patient not to cover the cold sore with a bandage or dressing.
- Advise patient or caregiver using ointment to use finger cot or rubber glove when applying to prevent spread of infection and to wash hands with soap and water after applying ointment.

- Advise patient or caregiver to apply enough ointment to adequately cover all lesions q 3 hr during waking hours (6 times/day) for 7 days. Advise patient or caregiver that a ½-inch ribbon of ointment should cover about 4 square inches.
- Advise patient or caregiver using cream to apply to lesions 5 times/day for 4 days and to wash hands with soap and water after each application.
- Advise patient or caregiver to notify health care provider if lesions do not appear to be improving, are getting worse, or if application site reactions (e.g., burning, stinging, redness, itching) develop.

Tablets, Capsules, or Suspension

- Review dose and appropriate dosing schedule depending on condition being treated (e.g., shingles, chickenpox, recurrent herpes). Instruct patient to take medication exactly as prescribed and not to stop taking or change the dose unless advised by health care provider.
- Advise patient that medication can be taken without regard to meals but to take with food if stomach upset occurs.
- Advise patient or caregiver using suspension to shake it well before measuring dose and to measure and administer prescribed dose using a dosing syringe, dosing dropper, or medicine cup.
- Remind patient using medication for recurrent episodes of herpes to initiate therapy at the first sign or symptom of recurrence and that medication may not be effective if started more than 6 hr after onset of signs or symptoms of recurrence.
- Advise patient with herpes that this drug is not a cure for herpes and does not prevent transmission of virus.
- Advise patient to contact health care provider if medication does not seem to be controlling lesions and/or symptoms or if intolerable side effects develop.
- Advise women to notify health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Instruct patient not to take any prescription or OTC medications, dietary supplements, or herbal preparations unless advised by health care provider.
- Advise patient that follow-up visits may be necessary to monitor therapy and to keep appointments.

adalimumab (ah-dah-LIM-you-mab)

Humira

Drug Class: Immunological agent

PHARMACOLOGY

Action

Blocks interaction of human tumor necrosis factor (TNF)-alpha with receptors and modulates biological responses induced or regulated by TNF.

Uses

Reduce signs and symptoms and inhibit progression of structural damage in patients with moderate to severe active rheumatoid arthritis who have had an inadequate response to one or more disease-modifying antirheumatic drugs.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Headache (≥5%); confusion, multiple sclerosis, paresthesia, subdural hematoma, tremor (<5%).

CVS: Arrhythmia, tachycardia, atrial fibrillation, syncope, palpitation (<5%).

GI: Nausea, abdominal pain (≥5%); cholecystitis, cholelithiasis, gastroenteritis, GI disorder and hemorrhage, vomiting (<5%).

RESP: URI, infection, sinusitis, flu-like syndrome (≥5%); asthma, bronchospasm, dyspnea, lung disorder, decreased lung function, pleural effusion, pneumonia (<5%).

MISC: Accidental injury, back pain (≥5%); fever, infection, pain in extremity, pelvic pain, sepsis, thorax pain, reactivated tuberculosis, lupus erythematosus syndrome, parathyroid disorder, adenoma, carcinoma (including breast, GI, skin, urogenital), lymphoma, malignancies, melanoma; leg thrombosis (<5%); serious infection (0.04%).

CLINICAL IMPLICATIONS

General

- *Immunosuppression:* May affect host defenses against infection and malignancies.
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs.
- *Arthritis:* Consider patient comfort and need for semisupine chair position.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.

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adefovir dipivoxil (Ah-DEF-fah-vihr die-pihv-VOX-ill)

Hepsera

Drug Class: Antiviral Agent

PHARMACOLOGY

Action

Inhibits HBV DNA polymerase (reverse transcriptase) by competing with the natural substrate deoxyadenosine triphosphate and by causing DNA chain termination after its incorporation into viral DNA.

Uses

Treatment of chronic HBV infection in adults with evidence of active viral replication and evidence of persistent elevations in serum aminotransferases (ALT or AST) or histologically active disease.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

Treatment-related adverse events reported in patients before and after transplantation include:

CNS: Headache.

GI: Nausea; vomiting; diarrhea; flatulence.

RESP: Increased cough; sinusitis.

MISC: Asthenia; abdominal pain; fever.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- Anticipate oral candidiasis when HIV disease is reported.
- If GI side effects occur, consider semisupine chair position.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values improve above this level.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.

Oral Health Education

- Recommend frequent maintenance prophylaxis when immunosuppression is evident.
- Encourage daily plaque control procedures for effective self-care since HIV infection reduces host resistance.

albuterol (al-BYOO-ter-ahl)

Proventil: Tablets: 2, 4 mg (as sulfate); Syrup: 2 mg (as sulfate) per 5 mL; Aerosol: Each actuation delivers 90 mcg albuterol; Solution for inhalation: 0.083%, 0.5% (as sulfate)
Proventil HFA: Aerosol: Each actuation delivers 90 mcg albuterol (as sulfate)
Ventolin: Tablets: 2, 4 mg (as sulfate); Syrup: 2 mg (as sulfate) per 5 mL; Solution for inhalation: 0.5% (as sulfate)
Ventolin Nebules: Solution for inhalation: 0.083% (as sulfate)
Ventolin Rotacaps: Capsules for inhalation: 200 mcg microfine (as sulfate)

Airomir, Alti-Salbutamol Sulfate, Apo-Salvent, Gen-Salbutamol Respirator Solution, Gen-Salbutamol Sterinebs P.F., Novo-Salmol, Nu-Salbutamol Solution, PMS-Salbutamol Respirator Solution, ratio-Salbutamol, Rho-Salbutamol, Rhoxal-salbutamol, Ventodisk Disk, Ventolin Diskus, Ventolin Oral Liquid

Inspiryl, Salbulin, Salbutalan, Volmax

Drug Class: Bronchodilator, sympathomimetic

PHARMACOLOGY

Action

Produces bronchodilation by relaxing bronchial smooth muscle through beta-2 receptor stimulation.

Uses

Prevention and treatment of reversible bronchospasm associated with asthma and other obstructive pulmonary diseases.

Unlabeled Uses

Adjunctive treatment of hyperkalemia in patients undergoing dialysis.

Contraindications

Cardiac tachyarrhythmias.

Usual Dosage

Inhalation Aerosol

Adults and Children at least 4 yr (at least 12 yr for Proventil): 1 to 2 inhalations q 4 to 6 hr.

For prevention of exercise-induced bronchospasm
2 inhalations 15 min before exercise.

Inhalation Solution

Adults and Children at least 12 yr: 2.5 mg/dose 3 to 4 times/day by nebulization.
Children 2 to 12 yr (Accuneb): 1.25 mg or 0.63 mg 3 to 4 times/day by nebulization.

Pharmacokinetics

ABSORP: *Tablets:* Rapidly absorbed; T_{max} is 2 hr; C_{max} is about 18 ng/mL. *Inhalation:* Less than 20% absorbed; T_{max} is 0.5 hr; C_{max} is 2.1 ng/mL.
EXCRET: $T_{1/2}$ is 5 to 6 hr. 76% recovered in urine over 3 days with 60% as metabolites; 4% excreted in feces.

ONSET: *Oral:* Within 30 min. *Inhalation:* Within 5 min.
DURATION: *Oral:* 4 to 8 hr. *Inhalation:* 3 to 6 hr.

DRUG INTERACTIONS

Beta-adrenergic blockers: Decreased bronchodilator effect (antagonism)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Taste changes; dry mouth; teeth discoloration.
CVS: Palpitations; tachycardia; elevated BP; chest tightness; angina.
CNS: Tremor; dizziness; hyperactivity; nervousness; headache; insomnia; weakness; drowsiness; restlessness.
GI: Nausea; vomiting; heartburn; diarrhea.
RESP: Cough; bronchospasm; wheezing; dyspnea.
MISC: Flushing; sweating; anorexia; unusual sensory changes.

CLINICAL IMPLICATIONS

General

If prescribed by DDS:
- Monitor vital signs (e.g., BP, pulse rate, respiratory function) before and after administration. Uncontrolled disease characterized by wheezing, coughing.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator available.
- Ensure that bronchodilator inhaler is present at each dental appointment.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Inhalants can dry oral mucosa; anticipate candidiasis, increased calculus and plaque levels, and increased caries.

Pregnancy Risk Category: Category C.

Oral Health Education

If prescribed by DDS:
- Teach patient correct method for using metered-dose inhaler. Have patient demonstrate proper technique, including timing between inhalations.
- Instruct patient in home monitoring of pulse and BP.
- Advise patient to maintain fluid intake of 2000 mL/day and to rinse mouth after each complete dose to prevent dryness.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Instruct patient not to use OTC inhalers without consulting health care provider.
- Instruct patient to contact health care provider if symptoms are not relieved by normal dose.
- Tell patient to report adverse reactions or side effects.

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alefacept (ah-LEE-fah-sept)

Amevive

Drug Class: Antipsoriatic; Immunosuppressant

PHARMACOLOGY

Action

Interferes with lymphocyte activation.

Uses

Treatment of adult patients with moderate to severe chronic plaque psoriasis who are candidates for systemic therapy or phototherapy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

GI: Nausea.

CNS: Dizziness.

RESP: Pharyngitis; increased cough.

MISC: Hypersensitivity reactions (e.g., urticaria, angioedema, anaphylactic reactions); malignancies; serious infections; lymphopenia; myalgia; chills; injection site reactions (e.g., pain, inflammation, bleeding, edema, nonspecific reaction, mass, skin hypersensitivity); accidental injury.

CLINICAL IMPLICATIONS

General

- *Immunosuppressive system:* Because of the risk of excessive immunosuppression, do not use with other immunosuppressive agents.
- *Serious infections:* Because alefacept is an immunosuppressive agent, it may increase the risk of infection and reactivate latent, chronic infections.
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If GI side effects occur, consider semisupine chair position.
- Consider semisupine chair position to assist respiratory function.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.
- Recommend frequent maintenance prophylaxis when immunosuppression is evident.

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alendronate sodium (al-LEN-droe-nate SO-dee-uhm)

Fosamax

Drug Class: Bisphosphonate

PHARMACOLOGY

Action

Inhibits bone resorption and increases bone density.

Uses

Treatment of osteoporosis in postmenopausal women; prevention of osteoporosis in postmenopausal women at risk of developing osteoporosis; increase bone mass in men; treatment of glucocorticoid-induced osteoporosis in men and women; treatment of Paget disease of the bone.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Nonsteroidal anti-inflammatory drugs: Increased gastric ulcers (additive with alendronate)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Osteonecrosis of jaw (rare); oropharyngeal ulceration.

CNS: Headache (3%); malaise (postmarketing).

GI: Abdominal pain (7%); acid regurgitation, flatulence (4%); constipation, diarrhea, dyspepsia, nausea (3%); esophageal ulcer (2%); abdominal distention, dysphagia, gastric ulcer, gastritis (1%); duodenal ulcer, esophagitis, esophageal erosion, esophageal stricture or perforation.

MISC: Fever; musculoskeletal pain.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Patients may be high-risk candidates for pathological fractures or jaw fractures during extractions.
- This drug is used for Paget disease. Be aware of the head and neck manifestations (e.g., macrognathia, alveolar pain, bone warm to touch).
- If GI side effects occur, consider semisupine chair position.
- Osteonecrosis of the jaw is reported; consider this adverse drug effect when osteolytic disease is suspected or when surgical procedures are indicated.

Oral Health Education

- Prevention of oral disease is theorized to prevent osteonecrosis of jaw. Regular oral examination for oral disease is essential.

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alfuzosin HCl (al-FEW-zoe-sin HIGH-droe-KLOR-ide)

Uroxatral

Drug Class: Alpha$_1$-adrenergic blocker

PHARMACOLOGY

Action

Selective blockade for alpha$_1$-adrenergic receptors in the lower urinary tract, which cause smooth muscle relaxation in the bladder neck and prostate, resulting in improved urine flow and reduced symptoms of benign prostatic hyperplasia (BPH).

Uses

Treatment of signs and symptoms of benign prostatic hyperplasia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole or itraconazole: Increased alfuzosin toxicity (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

CNS: Dizziness (6%); headache, fatigue (3%).

GI: Abdominal pain, dyspepsia, constipation, nausea (1% to 2%).

RESP: Upper respiratory tract infection (3%); bronchitis (1% to 2%).

MISC: Pain (1% to 2%); chest pain.

CLINICAL IMPLICATIONS

General

- If GI or respiratory side effects occur, consider semisupine chair position.

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aliskiren (a-LIS-KYE-ren)

Tekturna

Drug Class: Renin-angiotensin antagonist

PHARMACOLOGY

Action

Direct renin inhibitor, decreasing plasma renin activity and inhibiting conversion of angiotensinogen to angiotensin I.

All agents that inhibit the renin-angiotensin system suppress the negative feedback loop, leading to a compensatory rise in plasma renin concentration. Aliskiren blocks the clinical effect of increased renin levels.

Uses
Treatment of hypertension, either alone or in combination with other antihypertensive agents.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
GI: Diarrhea (2%).
RESP: Increased cough (1%).
CVS: Hypertension (<1%).
MISC: Angioedema (0.06%).

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use cardiac dose of vasoconstrictor (no more than 2 cartridges of 1:100,000 or 4 cartridges of 1:200,000). Use aspirating technique to prevent intravascular injection.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care in patients with cardiovascular disease.

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aliskiren/hydrochlorothiazide (a-LIS-kir-EN/high-droe-klor-oh-THIGH-uh-zide)

Synonym: hydrochlorothiazide/aliskiren

Tekturna HCT

Drug Class: Renin inhibitor/thiazide diuretic

PHARMACOLOGY
Action
Direct renin inhibitor decreasing plasma renin activity and inhibiting conversion of angiotensinogen to angiotensin 1.

Uses
For the treatment of hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Angioedema.
CNS: Dizziness; lightheadedness; vertigo; headache; paresthesias; weakness; restlessness; insomnia; giddiness; fatigue.
CVS: Orthostatic hypotension; arrhythmia.
GI: Anorexia, gastric irritation; nausea, vomiting, abdominal pain; diarrhea; constipation; pancreatitis.

RESP: Respiratory distress, cough; pneumonitis; pulmonary edema; flu-like symptoms.
MISC: Muscle cramps or spasm; photosensitivity; electrolyte imbalance; blood dyscrasias (e.g., leukopenia, thrombocytopenia, agranulocytosis, aplastic and hemolytic anemias); rash.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Monitor pulse rhythm to assess for electrolyte imbalance.
- Postural hypotension: Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several minutes at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care in patients with cardiovascular disease.

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alitretinoin (al-ih-TRET-ih-no-in)

Panretin

Drug Class: Retinoid

PHARMACOLOGY

Action

Binds to and activates all known intracellular retinoid receptor substrates. Once activated, these receptors function as transcription factors that regulate the expression of genes that control the process of cellular differentiation and proliferation of both normal and neoplastic cells.

Uses

Topical treatment of cutaneous lesions of AIDS-related Kaposi sarcoma (KS).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

MISC: Rash, pain, pruritus, edema, crusting at application site.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- Anticipate oral candidiasis when HIV disease is reported.

Oral Health Education

- Recommend frequent maintenance prophylaxis when immunosuppression is evident.
- Encourage daily plaque control procedures for effective self-care.

allopurinol (AL-oh-PURE-ee-nahl)

Aloprim, Zyloprim

Apo-Allopurinol, Novo-Purol

Atisuril, Unizuric 300, Zyloprim

Drug Class: Analgesic, Gout, Cytoprotective

PHARMACOLOGY

Action

Inhibits xanthine oxidase, the enzyme responsible for conversion of hypoxanthine to xanthine and then to uric acid.

Uses

TABLETS: Treatment of primary or secondary gout, hyperuricemia resulting from chemotherapy for malignancies, recurrent calcium oxalate renal calculi.

TABLETS AND INJECTIONS: Management of patients with leukemia, lymphoma, and solid tumor malignancies when concurrently receiving cancer therapy that causes elevations of serum and urinary uric acid levels. Injection used in patients who cannot tolerate oral therapy.

Unlabeled Uses

Prevention of fluorouracil-induced stomatitis and fluorouracil-induced granulocyte suppression.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Penicillins: Increased incidence of rash (mechanism unknown)

- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Taste loss; stomatitis, tongue edema, salivary gland swelling (<1%); lichenoid drug reaction (rare).

CNS: Drowsiness; headache; neuritis; paresthesias; peripheral neuropathy.

GI: Abdominal pain; diarrhea; dyspepsia; gastritis; granulomatous changes; nausea; vomiting.

MISC: Acute gouty attacks; arthralgia; fever; myopathy; necrotizing angiitis; maculopapular skin rash, thrombocytopenia (rare).

CLINICAL IMPLICATIONS

General

- If GI side effects occur, consider semisupine chair position.
- Patient may experience unilateral or bilateral TMJ pain (gouty arthritis) associated with acute exacerbation of gout.

Oral Health Education

- Gouty arthritis may affect fingers. Determine relevance to performing self-care procedures.
- Determine need for power toothbrush for self-care.

almotriptan malate (al-moe-TRIP-tan MAL-ate)

Axert

Drug Class: Analgesic, Migraine

PHARMACOLOGY

Action

Selective agonist for vascular serotonin (5-HT) receptor subtype, causing vasoconstriction of cranial arteries.

Uses
Acute treatment of migraine with or without aura.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth (1%).
CNS: Somnolence; headache; paresthesia; dizziness (≥1%).
CVS: Chest pain; tachycardia; hypertension (rare).
GI: Nausea (2%).

CLINICAL IMPLICATIONS
General
- This drug is used for an acute migraine attack. Patient is unlikely to come for dental treatment.
- Monitor vital signs (BP and pulse). Drugs for prevention are sympatholytic; drugs for treatment of acute attack are sympathomimetic.

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alosetron (al-OH-seh-trahn)
Lotronex

Drug Class: $5HT_3$ receptor antagonist

PHARMACOLOGY
Action
Selective serotonin ($5HT_3$) receptor antagonist that inhibits serotonin receptors in the GI tract.

Uses
Treatment of irritable bowel syndrome (IBS) in women whose predominant bowel syndrome is diarrhea.

Unlabeled Uses
Treatment of IBS in men; carcinoid diarrhea.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
CNS: Sleep disorders; depressive disorders.
GI: Constipation; nausea; GI discomfort and pain; abdominal discomfort and pain; GI gaseous symptoms; viral GI infections; dyspeptic symptoms; abdominal distention; hemorrhoids.
RESP: Allergic rhinitis; throat and tonsil discomfort and pain; bacterial ear, nose, and throat infections.

CLINICAL IMPLICATIONS
General
- This drug was removed from the market in 2000; only physicians who have completed training in monitoring adverse drug effects associated with the product may prescribe it.
- If GI side effects occur, consider semisupine chair position.

alprazolam (al-PRAY-zoe-lam)

Alprazolam Intensol: Oral solution: 1 mg/mL
Niravam: Orally disintegrating tablets: 0.25, 0.5, 1, 2 mg
Xanax: Tablets: 0.25, 0.5, 1, 2 mg
Xanax XR: Tablets, extended-release: 0.5, 1, 2, 3 mg

Apo-Alpraz, Apo-Alpraz TS, Gen-Alprazolam, Novo-Alprazol, Nu-Alpraz, ratio-Alprazolam, Xanax TS

Tafil

Drug Class: Antianxiety, benzodiazepine

DEA Schedule: Schedule IV

PHARMACOLOGY

Action

Potentiates action of GABA, an inhibitory neurotransmitter, resulting in increased neuronal inhibition and CNS depression, especially in limbic system and reticular formation.

Uses

Treatment of panic disorders with or without agoraphobia (Niravam, Xanax, Xanax XR); management of anxiety disorders or for short-term relief of symptoms of anxiety, including anxiety associated with depression (Niravam, immediate-release tablets and oral solution).

Unlabeled Uses

Treatment of irritable bowel syndrome, depression, premenstrual syndrome.

Contraindications

Hypersensitivity to other benzodiazepines; acute narrow-angle glaucoma; patients receiving itraconazole or ketoconazole.

Usual Dosage

Anxiety disorder

IMMEDIATE-RELEASE TABLETS AND ORAL SOLUTION

ADULTS: *PO:* Immediate-release tablets and oral solution: 0.25 to 0.5 mg tid (max, 4 mg/day in divided doses). Extended-release tablets: Start with 0.5 mg daily and gradually increase if needed (suggested total daily dose range 3 to 6 mg/day).

Pharmacokinetics

ABSORP: Readily absorbed; T_{max} is 1 to 2 hr; C_{max} is 8 to 37 ng/mL (0.5 to 3 mg doses).
DIST: 80% protein bound. Crosses the placenta and is excreted in breast milk.
METAB: Metabolized in the liver to alpha-hydroxy-alprazolam (activity is approximately 50% that of alprazolam) and a benzophenone derivative (inactive).
EXCRET: The $t_{1/2}$ is approximately 16.3 hr. Excreted in the urine.
SPECIAL POP: *Hepatic failure*: The $t_{1/2}$ is approximately 19.7 hr in those with alcoholic liver disease.
Elderly: The $t_{1/2}$ is approximately 16.3 hr.
Obese: The $t_{1/2}$ is approximately 21.8 hr.

DRUG INTERACTIONS

Alcohol: Increased CNS depression (additive and decreased metabolism of alprazolam)
- Avoid concurrent use.

Ketoconazole and itraconazole: Possible alprazolam toxicity (decreased metabolism)
- Monitor clinical status.

Fluoxetine: Possible increased impairment of skills related to driving (decreased metabolism)
- Warn patients of the risk.

Propoxyphene: Possible alprazolam toxicity (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (15%); increased salivation (6%).
CVS: Tachycardia (15%); hypotension (5%); palpitation (≥1%).
CNS: Drowsiness (77%); fatigue/tiredness (49%); sedation (45%); irritability, memory impairment (33%); cognitive disorder (29%); somnolence (23%); light-headedness (21%); de-

creased libido (14%); depression (12%); dysarthria (11%); confusional state (10%); abnormal coordination (9%); ataxia, mental impairment (7%); disturbed attention, impaired balance, disinhibition (3%); disorientation, paresthesia, dyskinesia, talkativeness, derealization, abnormal dreams, lethargy (2%); anxiety, hypesthesia, hypersomnia, fear, warm feeling (1%); malaise, weakness, headache, dizziness, tremor, irritability, insomnia, nervousness, increased libido, restlessness, agitation, depersonalization, nightmare (≥1%).

GI: Constipation (26%); nausea/vomiting (22%); diarrhea (21%); abdominal distress (18%); dry mouth (15%); increased salivation (6%); dyspepsia, abdominal pain (≥1%).

RESP: URI (4%); dyspnea (2%); hyperventilation (≥1%).

MISC: Chest pain (≥1%); hyperprolactinemia.

CLINICAL IMPLICATIONS

General

When prescribed by DDS:

- *Lactation:* Excreted in breast milk.
- *Children:* Safety and efficacy in children younger than 18 yr of age not established.
- *Elderly:* Use smallest effective dose to preclude development of ataxia or overdosage.
- *Renal failure:* Caution is needed to avoid accumulation of drug.
- *Hepatic failure:* Caution is needed to avoid accumulation of drug.
- *Dependence:* Prolonged use can lead to physical and psychological dependence. Withdrawal syndrome has occurred within 4 to 6 wk of treatment, especially if abruptly discontinued. Cautious use and tapering of dosage are necessary.
- *Fetal harm:* There is a risk of fetal harm (e.g., congenital abnormalities) when used during pregnancy.
- *Impaired pulmonary function:* Death has been reported in patients with pulmonary disease shortly after starting alprazolam treatment.
- *Interdose symptoms:* Early morning anxiety and emergence of anxiety symptoms between doses have been reported in patients with panic disorder.
- *Mania:* Hypomania and mania have been reported.
- *Psychiatric disorders:* Not intended for patients with primary depressive disorder, psychoses, or disorders in which anxiety is not prominent.
- *Seizures:* May occur during abrupt drug discontinuation or dose reduction.
- *Suicide:* Use with caution in patients with suicidal tendencies; do not allow access to large quantities of drug.
- *Overdosage:* Somnolence, confusion, impaired coordination, diminished reflexes, coma, death.

When prescribed by medical provider:

- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.

Pregnancy Risk Category: Category D.

Oral Health Education

When prescribed by DDS:

- Explain name, dose, action, and potential side effects of drug.
- Advise patient or caregiver to read the *Patient Information* leaflet before starting therapy and with each refill.
- Advise patient that medication is usually started at a low dose and then gradually increased until maximum benefit is obtained.
- Caution patient that medication may be habit forming and to take as prescribed and not to increase the dose or frequency of use unless advised by health care provider.
- Advise patient to take each dose without regard to meals but to take with food if stomach upset occurs.
- Advise patient using extended-release tablets to take prescribed dose once daily, prefera-

bly in the morning. Caution patient to swallow tablets whole and not to crush, chew, divide, or break the tablet.
- Advise patient or caregiver using oral solution to measure prescribed dose using calibrated dropper and then add solution to a liquid (e.g., juice, water, soda) or semisolid food (e.g., applesauce, pudding), stir for a few sec then immediately take (give) the entire mixture. Caution patient or caregiver not to prepare mixtures ahead of time and store.
- Advise patient using orally disintegrating tablet to remove tablet from bottle immediately before administration using dry hands and to place the tablet on top of tongue where it will disintegrate and be swallowed with saliva. Advise patient that administration with liquid is not required. Instruct patient to discard any cotton that was included in the bottle and to reseal the bottle tightly after removing tablet(s) to prevent introducing moisture into bottle (which can cause the tablets to disintegrate).
- Caution patient using half of a scored orally disintegrating tablet to discard the unused portion of the tablet and not to save for future use, because the remaining tablet portion may not be stable.
- Advise patient that if a dose is missed to skip that dose and take the next one at the regularly scheduled time. Caution patient to never take two doses at the same time.
- Advise patient that if medication needs to be discontinued it will be slowly withdrawn for a period of 2 wk or more unless safety concerns (e.g., rash) require a more rapid withdrawal. Caution patient not to stop taking the medication abruptly or decrease the dose unless advised by health care provider because of the risk of withdrawal symptoms occurring.
- Instruct patient to avoid alcoholic beverages and other depressants while taking this medication.
- Advise patient with anxiety to take as needed and to seek alternative methods for controlling or preventing anxiety (e.g., stress reduction, counseling).
- Instruct patient to contact health care provider if symptoms do not appear to be getting better, worsen, or if bothersome side effects (e.g., drowsiness, memory impairment) occur.
- Advise patient that drug may cause drowsiness or impair judgment, thinking, or reflexes and to use caution while driving or performing other tasks requiring mental alertness until tolerance is determined.
- Advise women to notify health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Warn patient not to take any prescription or OTC drugs, herbal preparations, or dietary supplements without consulting health care provider.
- Advise patient that follow-up visits may be necessary to monitor therapy and to keep appointments.

When prescribed by medical provider:
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care.

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amantadine HCl (uh-MAN-tuh-deen HIGH-droe-KLOR-ide)

Amantadine HCl, Symmetrel

Endantadine, Gen-Amantadine, Symmetrel

Drug Class: Antiparkinson; Antiviral

PHARMACOLOGY

Action

Exact mechanism is unknown; thought to facilitate dopamine release from intact dopaminergic terminals, increasing dopamine concentration at dopaminergic terminals. Exhibits antiviral activity against influenza A virus by inhibiting entry of virus into host cell.

Uses

Symptomatic treatment of several forms of Parkinson disease or syndrome and drug-induced extrapyramidal reactions; prevention and treatment of influenza A viral respiratory illness, especially in high-risk patients.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (10%).

CNS: Dizziness, lightheadedness, insomnia (5% to 10%); depression, anxiety, irritability, hallucinations, confusion, headache, somnolence, nervousness, abnormal dreams, agitation (1% to 5%); coma; stupor; delusions; aggressive behavior; paranoid reaction; manic reaction; involuntary muscle contractions; abnormal gait; paresthesia; EEG changes; tremor.

CVS: Orthostatic hypotension (infrequent); tachycardia; mild bradycardia.

GI: Nausea (5% to 10%); constipation, diarrhea (1% to 5%); dysphagia.

RESP: Acute respiratory failure; pulmonary edema; tachypnea.

MISC: Ataxia, livedo reticularis, peripheral edema, fatigue (1% to 5%); allergic reactions (including anaphylactic reactions, edema, and fever); neuroleptic malignant syndrome.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Prolonged use can lead to significant xerostomia. Anticipate increased caries, candidiasis, and oral discomfort.
- Monitor vital signs due to potential CV side effects.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Parkinson disease can cause tremors and neuromuscular problems. Determine need for power toothbrush for self-care.

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ambenonium Cl (am-be-NOE-nee-um)

Mytelase

Drug Class: cholinesterase inhibitor

PHARMACOLOGY

Action

Inhibits destruction of acetylcholinesterase, which facilitates transmission of impulses across the myoneural junction.

Uses

Cholinergic for treatment of myasthenia gravis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Increased salivation; dysphagia.

CNS: Dizziness; loss of consciousness; convulsions; drowsiness; speech disturbances.

CVS: Arrhythmia; bradycardia; hypotension; tachycardia (uncommon); cardiac arrest; syncope.

GI: Nausea; vomiting; diarrhea; abdominal cramps.

RESP: Increased bronchial secretions; laryngospasm; dyspnea; respiratory arrest.

MISC: Muscle weakness; muscle cramps; diaphoresis; flushing.

CLINICAL IMPLICATIONS

General

- Excessive salivation may complicate crown and bridge impression procedures; anticipate need for suction control. Avoid drugs that reduce salivary flow, as they may antagonize this drug.
- Disease may cause patient to be unable to keep mouth open for long periods; anticipate need for short appointments.
- Monitor vital signs. Follow protocol to avoid postural hypotension at end of appointment.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Determine need for power toothbrush for self-care.

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amifostine (am-ih-FOSS-teen)

Ethyol: Powder for injection, lyophilized: 500 mg (anhydrous basis)

Ethyol

Drug Class: Cytoprotective agent

PHARMACOLOGY

Action

Organic thiophosphate cytoprotective agent that can reduce the toxicity of cisplatin. It binds to, and thereby detoxifies, reactive metabolites of cisplatin. It scavenges reactive oxygen species generated by exposure to cisplatin radiation.

Uses

Prevent or reduce renal damage in patients receiving repeated cisplatin doses for advanced ovarian or non–small cell lung cancer; reduce incidence of moderate to severe xerostomia in patients undergoing radiation of the parotid gland for head and neck cancer.

Unlabeled Uses

Prevent or reduce cisplatin-induced neurotoxicity and cyclophosphamide-induced granulocytopenia; prevent or reduce toxicity of radiation therapy to other areas; reduce toxicity of paclitaxel.

Contraindications

Sensitivity to amifostine and aminothiol.

Usual Dosage

Reduction of cumulative renal toxicity with chemotherapy

ADULTS: IV Amifostine 910 mg/m² once daily as a 15-min IV infusion, 30 min before chemotherapy.

Reduction of moderate to severe xerostomia from radiation of the head and neck

ADULTS: IV Amifostine 200 mg/m² once daily as a 3-min IV infusion, 15 to 30 min prior to standard fraction radiation therapy (1.8 to 2.5 Gy).

Pharmacokinetics

ABSORP: Immediate following IV administration.

DIST: Distribution $t_{1/2}$ is less than 1 min.

METAB: Amifostine is a prodrug that is dephosphorylated by alkaline phosphatase in tissues to the active free thiol metabolite. A disulfide metabolite is then subsequently produced.

EXCRET: Rapidly cleared from plasma; elimination $t_{1/2}$ is about 8 min. Renal excretion is 0.69% to 2.64% (parent compound and metabolites).

DRUG INTERACTIONS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Erythema multiforme, Stevens-Johnson syndrome.

CVS: Hypotension (all grades 61%); hypotension (associated with apnea, dyspnea, hypoxia, tachycardia, bradycardia, extrasystoles, chest pain, MI, and respiratory and cardiac arrest); arrhythmias (including atrial fibrillation/flutter and supraventricular tachycardia); cardiac arrest; transient hypertension; exacerbation of preexisting hypertension; syncope.

CNS: Dizziness; somnolence; seizures.

GI: Nausea and vomiting (all grades 96%).

RESP: Sneezing; hiccoughs.

MISC: Flushing; feeling of warmth; chills, feeling of coldness, fever; allergic reactions (including hypotension, fever, chills, rigors, dyspnea, hypoxia, chest tightness, cutaneous eruption, urticaria, laryngeal edema); anaphylactoid reactions.

CLINICAL IMPLICATIONS

General

- *Malignancy:* Seek medical consultation to determine WBC and platelet count before invasive dental procedures, including periodontal debridement.
- This drug is a hospital-use drug, and is therefore unlikely to cause adverse effects at a dental appointment.
- Apply lubricant to dry lips for patient comfort before oral procedures if lips are dry.
- Dental treatment may be provided during chemotherapy and treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several minutes at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Avoid prescribing opioids for dental pain. Acetaminophen is appropriate if GI bleeding is present.
- Advise products for palliative relief of oral manifestations (stomatitis, mucositis, xerostomia, etc.) of chemotherapy, as needed.

Oral Health Education

- Encourage client to follow daily plaque control procedures for nontraumatic and effective self-care.

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amiloride HCl (uh-MILL-oh-ride HIGH-droe-KLOR-ide)

Midamor

Drug Class: Potassium-sparing diuretic

PHARMACOLOGY

Action

Interferes with sodium reabsorption at distal tubule, resulting in increased excretion of water and sodium and decreased excretion of potassium.

Uses

Treatment of CHF or hypertension (in combination with thiazide or loop diuretics) and diuretic-induced hypokalemia.

Unlabeled Uses

Reduction of lithium-induced polyuria; slowed reduction of pulmonary function in patients with cystic fibrosis (aerosol form).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; thirst.

CNS: Headache; dizziness; encephalopathy; paresthesia; tremors; vertigo; nervousness; mental confusion; insomnia; decreased libido; depression.

CVS: Irregular heartbeat (hyperkalemia); orthostatic hypotension, angina pectoris, palpitation (<1%).

GI: Nausea; anorexia; diarrhea; vomiting; abdominal pain; gas pain; appetite changes; constipation; GI bleeding; abdominal fullness; heartburn; flatulence.

RESP: Cough; dyspnea.

MISC: Musculoskeletal (e.g., weakness; fatigue; muscle cramps; joint/back/chest pain; neck or shoulder ache).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions.
- Monitor pulse rhythm to assess for electrolyte imbalance.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible. Anticipate increased caries, candidiasis, and lichenoid mucositis.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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aminocaproic acid (uh-mee-no-kuh-PRO-ik AS-id)

Amicar

Drug Class: Hemostatic

PHARMACOLOGY

Action

Inhibits fibrinolysis to stop bleeding.

Uses

Treatment of excessive bleeding from systemic hyperfibrinolysis and urinary fibrinolysis.

Unlabeled Uses

Prevention of recurrence of subarachnoid hemorrhage; management of amegakaryocytic thrombocytopenia; abortion; or prevention of attacks of hereditary angioneurotic edema.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions of significance to dentistry. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CVS: Bradycardia; hypotension; peripheral ischemia; thrombosis intracranial hypertension; stroke; syncope.

CNS: Dizziness; headache; delirium; hallucinations; confusion.

GI: Nausea; diarrhea; abdominal pain; vomiting.

RESP: Dyspnea; nasal congestion; pulmonary embolism.

MISC: Injection site reaction; pain and necrosis; myalgia; myositis; myopathy (characterized by muscle weakness, fatigue, elevated creatinine phosphokinase, rhabdomyolysis associated with myoglobinuria and renal failure); edema; allergic and anaphylactic reactions; anaphylaxis; malaise.

CLINICAL IMPLICATIONS

Oral Health Education

When used by DDS:

- Caution patient to avoid sudden position changes to prevent orthostatic hypotension.
- Advise patient to use soft toothbrush or sponge for dental care.
- Instruct patient to report the following symptoms to health care provider: gingival bleeding, epistaxis, hematuria, skin changes (e.g., ecchymosis, petechiae), difficulty in urination, reddish-brown urine, chest or leg pain, or difficulty breathing.

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aminophylline (am-in-AHF-ih-lin)

Synonym: theophylline ethylenediamine

Phyllocontin, Truphylline

 **Phyllocontin, Phyllocontin-350**

 **Drafilyn**

Drug Class: Bronchodilator; Xanthine derivative

PHARMACOLOGY

Action

Relaxes bronchial smooth muscle and pulmonary blood vessels; stimulates central respiratory drive; increases diaphragmatic contractility.

Uses

Prevention or treatment of reversible bronchospasm associated with asthma or COPD.

Unlabeled Uses

Treatment of apnea and bradycardia of prematurity.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Diazepam, alprazolam, or midazolam: Decreased effect with aminophylline (mechanism unknown)

- Avoid concurrent use.

Erythromycin, clarithromycin, or azithromycin: Possible aminophylline toxicity (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

CNS: Irritability; headache; insomnia; muscle twitching; seizures.

CVS: Hypotension; tachycardia; ventricular arrhythmia (i.e., toxicity).

GI: Nausea; vomiting; anorexia, diarrhea; gastroesophageal reflux; epigastric pain.

RESP: Tachypnea; respiratory arrest.

MISC: Fever; flushing; hyperglycemia; inappropriate antidiuretic hormone secretion; sensitivity reactions (e.g., exfoliative dermatitis, urticaria).

CLINICAL IMPLICATIONS

General

- *Toxicity:* Patients with liver impairment or cardiac failure and those older than 55 yr are at greatest risk.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function. Uncontrolled disease characterized by wheezing, coughing.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Ensure that bronchodilator inhaler is present at each dental appointment.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Therapeutic doses may induce GERD while in supine position, increasing risk of aspiration and bronchospasm. Use semisupine chair position.

Oral Health Education

- Advise patient not to smoke. If patient changes smoking habits or stops smoking, dosage adjustment may be necessary.

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aminosalicylate sodium (uh-MEE-no-suh-LIS-ih-late SO-dee-uhm)

Synonym: para-aminosalicylate sodium; PAS

Paser

Drug Class: Anti-infective; Antitubercular

PHARMACOLOGY

Action

Competitively antagonizes metabolism of para-aminobenzoic acid, resulting in bacteriostatic activity against *Mycobacterium tuberculosis*.

Uses

Treatment of tuberculosis (in combination with other antituberculous drugs) caused by susceptible strains of tubercle bacilli.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

GI: Nausea; vomiting; diarrhea; abdominal pain.

MISC: Hypersensitivity (e.g., fever, skin eruptions, infectious mononucleosis–like syndrome, leukopenia, agranulocytosis, thrombocytopenia, hemolytic anemia, jaundice, hepatitis, encephalopathy, Löffler syndrome, vasculitis).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken (prevention or treatment). Consider implications of condition on dental treatment.
- Complete medical consultation to ensure noninfectious state exists before providing dental treatment. For dental emergencies, follow special precautions to minimize disease transmission (particulate respirators) or refer patient to a hospital-based dental facility.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Monitor patient for signs of active disease (e.g., cough, blood in sputum, night sweats, fever). If positive for signs, refer for medical evaluation.

- *CDC advises to ensure noninfectiousness by these criteria:* Anti-TB drugs have been taken for >3 wk and culture confirmed susceptibility to TB organism; patient is not coughing; two consecutive sputum smears were negative for TB organism.

amiodarone (uh-MEE-oh-duh-rone)

Cordarone, Pacerone

Gen-Amiodarone, Novo-Amiodarone, ratio-Amiodarone, Rhoxal-amiodarone

Braxan, Cardiorona, Cordarone

Drug Class: Antiarrhythmic

PHARMACOLOGY

Action

Prolongs action potential duration and refractory period in myocardial cells; acts as noncompetitive inhibitor of alpha- and beta-adrenergic receptors.

Uses

ORAL: Treatment of life-threatening recurrent ventricular arrhythmias (i.e., ventricular fibrillation and hemodynamically unstable ventricular tachycardia) that do not respond to other antiarrhythmic agents. Use only in patients with the indicated life-threatening arrhythmias because its use is accompanied by substantial toxicity.

PARENTERAL: Initiation of treatment and prophylaxis of frequently recurring ventricular fibrillation and hemodynamically unstable ventricular tachycardia in patients refractory to other therapy; treatment of ventricular tachycardia and fibrillation when oral amiodarone is indicated but patient is unable to take oral medication.

Unlabeled Uses

Conversion of atrial fibrillation and maintenance of sinus rhythm; treatment of supraventricular tachycardia; IV amiodarone has been used to treat AV nodal reentry tachycardia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fentanyl: Increased cardiotoxicity with amiodarone (mechanism unknown)

- Monitor vital signs.

ADVERSE EFFECTS

⚠ **ORAL:** Abnormal salivation (1% to 3%); bitter or metallic taste.

CNS: Fatigue; malaise; tremor/abnormal involuntary movements; lack of coordination; abnormal gait/ataxia; dizziness; paresthesias; decreased libido; insomnia; headache; sleep disturbances; abnormal sense of smell.

CVS: Bradycardia; arrhythmia; hypotension (<1%).

GI: Nausea, vomiting, constipation, anorexia, abdominal pain, abnormal salivation (oral); diarrhea (parenteral).

RESP: Pulmonary inflammation or fibrosis, progressive dyspnea, pulmonary toxicosis, and death (oral); lung edema, respiratory disorder (parenteral).

MISC: Edema, photosensitivity (10%); photophobia, hyperthyroidism, or hypothyroidism (oral); fever (parenteral).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions.
- Patients taking this drug have significant CV disease. Medical consult to determine patient's ability to withstand stress of dental treatment is recommended.
- If GI or respiratory side effects occur, consider semisupine chair position.

- As needed for photophobia, direct dental light out of patient's eyes and offer dark glasses for comfort.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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amitriptyline HCl (am-ee-TRIP-tih-leen HIGH-droe-KLOR-ide)

Amitriptyline

APO-Amitriptyline

Anapsique, Tryptanol

Drug Class: Tricyclic antidepressant

PHARMACOLOGY

Action

Inhibits presynaptic reuptake of norepinephrine and serotonin in CNS.

Uses

Relief of depression. Endogenous depression is more likely to be alleviated than are other depressive states.

Unlabeled Uses

Management of chronic pain associated with migraine, tension headache, phantom limb syndrome pain, tic douloureux, diabetic neuropathy, peripheral neuropathy, cancer, or arthritis; treatment of panic and eating disorders.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole: Possible amitriptyline toxicity (decreased metabolism)
- Monitor clinical status.

Diazepam: Increased impairment of skills related to driving (additive)
- Warn patients of the risk of driving.

Propoxyphene: Possible amitriptyline toxicity (decreased metabolism)
- Avoid concurrent use.

Pentazocine: Possible respiratory depression (additive)
- Monitor clinical status.

Tramadol: Increased risk of seizure (additive)
- Avoid concurrent use.

Sympathomimetic amines: Hypertension or hypertensive crisis (inhibition of epinephrine/norepinephrine uptake)
- Use local anesthetic agents with a vasoconstrictor with caution while monitoring vital signs.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (>10%); taste disturbance.
CNS: Confusion; hallucinations; disturbed concentration; decreased memory; delusions; nervousness; restlessness; agitation; panic; insomnia; nightmares; mania; exacerbation of psychosis; drowsiness; dizziness; weakness; emotional lability; numbness; tremors; extrapyramidal symptoms (e.g., pseudoparkinsonism, movement disorders, akathisia); seizures.
CVS: Orthostatic hypotension.
GI: Nausea; vomiting; anorexia; GI distress; diarrhea; flatulence; constipation.
RESP: Pharyngitis; rhinitis; sinusitis; cough.
MISC: Breast enlargement agranulocytosis, blood dyscrasias (rare).

CLINICAL IMPLICATIONS

General

- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.

- Chronic dry mouth is possible; anticipate increased caries and candidiasis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- If GI side effects occur, consider semisupine chair position.
- Avoid using epinephrine-impregnated gingival reaction cord concurrently.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Evaluate manual dexterity; consider need for power toothbrush.

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amlexanox (am-LEX-an-ox)

Aphthasol: Oral Paste: 5% (5-g tube)

Drug Class: Topical antiinflammatory agent

PHARMACOLOGY

Action

The mechanism of action by which amlexanox accelerates healing of aphthous ulcers is unknown. In vitro studies have demonstrated amlexanox to be a potent inhibitor of the formation or release of inflammatory mediators (histamine and leukotrienes) from mast cells, neutrophils, and mononuclear cells. Given orally to animals, amlexanox has demonstrated antiallergenic and antiinflammatory activities and has been shown to suppress both immediate- and delayed-type hypersensitivity reactions. The relevance of these activities of amlexanox to its effects on aphthous ulcers has not been established.

Uses

For the treatment of aphthous ulcers in people with normal immune systems.

Contraindications

Hypersensitivity to amlexanox (contains benzyl alcohol).

Usual Dosage

Aphthous ulcers

Oral paste

Adults and Children: The paste should be applied as soon as possible after noticing the symptoms of an aphthous ulcer and should be used 4 times daily, preferably following oral hygiene after breakfast, lunch, dinner, and at bedtime. Squeeze a dab of paste approximately 0.25 inch (0.5 cm) onto a fingertip. With gentle pressure, dab the paste onto each ulcer in the mouth. Use of the medication should be continued until the ulcer heals. If significant healing or pain reduction has not occurred in 10 days, consult your dentist or physician.

Pharmacokinetics

Systemic absorption directly through the active ulcer is minimal; most of the systemic absorption is via the GI tract; however, no systemic accumulation was noted with up to 4 weeks of use.

DRUG INTERACTIONS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Transient stinging and burning on application, contact mucositis.

GI: Nausea.

CLINICAL IMPLICATIONS

General

- Aphthous ulcerations can be associated with systemic conditions; evaluate as needed for etiology if healing has not occurred after 10 days.
- Ensure patient knows how to take the drug, how long it should be taken, and to immediately report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset). See Chapter 5: *Medical Management of Selected Oral Conditions*.
- *Lactation:* Caution should be exercised when administering amlexanox oral paste during lactation.
- *Local irritation:* Wash hands immediately after applying amlexanox oral paste directly to ulcers with the fingertips. In the event that a rash or contact mucositis occurs, discontinue use.
- *Carcinogenesis:* Amlexanox was not carcinogenic when administered orally to rats for 2 years and to mice for 18 months.
- *Mutagenesis:* In vitro (Ames) and in vivo (mouse micronucleus) mutagenicity tests of amlexanox were negative.
- *Fertility impairment:* Amlexanox at doses up to 200 times the projected human daily dose, on a mg/m² basis, did not significantly affect fertility or general reproductive performance in rats.
- *Children:* Safety and effectiveness of amlexanox oral paste in pediatric patients have not been established.
- *Elderly:* Clinical studies of amlexanox oral paste did not include sufficient numbers of subjects aged 65 and older to determine whether they respond differently from younger subjects. Other reported clinical experience has not identified differences in responses between the elderly and younger patients. In general, dose selection for an elderly patient should be cautious, usually starting at the low end of the dosing range, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or other drug therapy.

Pregnancy Risk Category: Category B.

Oral Health Education

- Apply the paste as soon as possible after noticing the symptoms of an aphthous ulcer. Continue to use the paste 4 times daily, preferably following oral hygiene after breakfast, lunch, dinner, and at bedtime.
- Dry the ulcer(s) by gently patting it with a soft, clean cloth.
- Wash your hands before applying amlexanox oral paste.
- Moisten the tip of your index finger.
- Squeeze a dab of paste approximately 0.25 inch (0.5 cm) onto a fingertip.
- Gently dab the amlexanox oral paste onto the ulcer. Repeat the process if you have more than one ulcer.
- Wash hands immediately after applying amlexanox oral paste.
- Wash eyes promptly if they should come in contact with the paste.
- Use the paste until the ulcer heals. If significant healing or pain reduction has not occurred in 10 days, consult your dentist or physician.
- Keep out of the reach of children.

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amlodipine (am-LOW-dih-PEEN)

Norvasc

Norvas

Drug Class: Calcium channel blocker

PHARMACOLOGY

Action

Inhibits movement of calcium ions across cell membrane in systemic and coronary vascular smooth muscle.

Uses

Hypertension; chronic stable angina; vasospastic (Prinzmetal or variant) angina.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, thirst, gingival hyperplasia (<1%).
CNS: Headache; dizziness; lightheadedness; fatigue; lethargy; somnolence.
CVS: Edema (14.5%); palpitations (4.5%); postural hypotension (<1%); flushing (4.5%).
GI: Nausea; abdominal discomfort; cramps; dyspepsia.
RESP: Shortness of breath; dyspnea; wheezing.
MISC: Flushing; sexual difficulties; muscle cramps, pain, or inflammation.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Chronic dry mouth is possible; anticipate increased caries activity, candidiasis, and lichenoid mucositis.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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amlodipine/benazepril HCl (am-LOW-dih-PEEN/ben-AZE-uh-pril HIGH-droe-CLOR-ide)

Synonym: benazepril HCl/amlodipine

Lotrel

Drug Class: Calcium channel blocker; Antihypertensive; ACE inhibitor

PHARMACOLOGY

Action

AMLODIPINE: Inhibits movement of calcium ions across cell membrane in systemic and coronary vascular smooth muscle.

BENAZEPRIL: Competitively inhibits angiotensin I–converting enzyme, resulting in the prevention of angiotensin I conversion to angiotensin II, a potent vasoconstrictor that stimulates aldosterone secretion. This action results in a decrease in sodium and fluid retention, an increase in diuresis, and a decrease in blood pressure.

Uses

Treatment of hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

See *amlodipine:* Drug Interactions Related to Dental Therapeutics
See *benazepril:* Drug Interactions Related to Dental Therapeutics

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.
CNS: Headache; dizziness; somnolence; fatigue; insomnia; nervousness; anxiety; tremor; decreased libido.
CVS: Palpitations; flushing; dizziness; hypotension.
GI: Nausea; abdominal pain; constipation; diarrhea; dyspepsia.
RESP: Cough; pharyngitis.
MISC: Edema; flushing; hot flashes; angioedema; asthenia; back pain; other musculoskeletal pain; cramps; muscle cramps; neutropenia, agranulocytosis (rare).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient, and use aspirating technique to prevent intravascular injection.
- If coughing is problematic, consider semisupine chair position for treatment.
- Susceptible patient with DM may experience severe recurrent hypoglycemia.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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amlodipine besylate/atorvastatin calcium (am-LOW-duh-PEEN BEH-sih-LATE/ah-TORE-vah-STAT-in KAL-see-uhm)

Caduet

Drug Class: Antihyperlipidemic combination

PHARMACOLOGY

Action

Amlodipine: Inhibits movement of calcium ions across cell membrane in systemic and coronary vascular smooth muscle.
Atorvastatin: Increases rate at which body removes cholesterol from blood and reduces production of cholesterol in body by inhibiting enzyme that catalyzes early rate-limiting step in cholesterol synthesis; increases HDL; reduces LDL, VLDL, and triglycerides (TG).

Uses

Amlodipine: Treatment of hypertension; chronic stable angina; confirmed or suspected vasospastic angina (Prinzmetal or Variant angina).
Atorvastatin: As an adjunct to diet to reduce elevated total cholesterol (C), LDL-C, apo B, and TG levels in patients with primary hypercholesterolemia and mixed dyslipidemia; adjunct to diet for treatment of elevated serum TG levels (Fredrickson Type IV); treatment of primary dysbetalipoproteinemia (Fredrickson Type III); reduce total-C and LDL-C in patients

with homozygous familial hypercholesterolemia, and apo B levels in boys and postmenarchal girls, 10 to 17 years of age, with heterozygous familial hypercholesterolemia if after an adequate trial of diet therapy the following are present: LDL-C remains at 190 mg/dL or higher; LDL-C remains at 160 mg/dL or higher and there is positive family history of premature cardiovascular disease (CVD) or 2 or more CVD risk factors are present in children.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole: increased atorvastatin toxicity, including rhabdomyolysis (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** *Atorvastatin:* Dry mouth, glossitis, mouth ulceration, ulcerative stomatitis, gum hemorrhage.

CVS: Amlodipine: Palpitation (5%); vasodilation, syncope, migraine, postural hypotension, phlebitis, arrhythmia, angina pectoris, hypertension (less than 2%).

CNS: *Amlodipine:* Fatigue (5%); dizziness (3%); somnolence (2%).
Atorvastatin: Headache (17%); asthenia (4%); insomnia, dizziness (more than 2%); paresthesia, somnolence, amnesia, abnormal dreams, decreased libido, emotional lability, incoordination, peripheral neuropathy, torticollis, facial paralysis, hyperkinesia, depression, hypesthesia, hypertonia (less than 2%).

GI: *Amlodipine:* Nausea (3%); abdominal pain (2%).
Atorvastatin: Abdominal pain, diarrhea, dyspepsia (4%); constipation, flatulence (3%); nausea (more than 2%); gastroenteritis, colitis, vomiting, gastritis, rectal hemorrhage, esophagitis, eructation, anorexia, increased appetite, biliary pain, cheilitis, duodenal ulcer, dysphagia, enteritis, melena, stomach ulcer, tenesmus.

RESP: *Atorvastatin:* Sinusitis (6%); pharyngitis (3%); bronchitis (more than 2%); pneumonia, dyspnea, asthma, epistaxis (less than 2%).

MISC: *Amlodipine:* Edema (15%); flushing (5%).
Atorvastatin: Infection (10%); accidental injury (4%); flu syndrome, allergic reaction (3%); chest pain (at least 2%); face edema, fever, malaise (less than 2%); angioneurotic edema (postmarketing).

CLINICAL IMPLICATIONS

General

- High LDL cholesterol concentration is the major cause of atherosclerosis, which leads to CAD (angina, MI); determine degree of CV health and ability to withstand stress of dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Postural hypotension: Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several minutes at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Use cardiac dose of vasoconstrictor (no more than 2 cartridges of 1:100,000 or 4 cartridges of 1:200,000). Use aspirating technique to prevent intravascular injection.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Advise products for palliative relief of oral manifestations (stomatitis, xerostomia, etc.).

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients with cardiovascular disease.

- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.

amoxicillin (uh-MOX-ih-sil-in)

Amoxil: Tablets, chewable: 200, 400 mg (as trihydrate); Tablets: 500, 875 mg (as trihydrate); Powder for oral suspension: 125 mg/5 mL, 200 mg/5 mL, 250 mg/5 mL, 400 mg/5 mL (as trihydrate) when reconstituted
Amoxil Pediatric Drops: Powder for oral suspension: 50 mg/mL (as trihydrate) when reconstituted
Moxatag: Tablets, extended-release: 775 mg
Trimox: Tablets, chewable: 125, 250 mg (as trihydrate); Capsules: 250, 500 mg (as trihydrate); Powder for oral suspension: 125 mg/5 mL, 250 mg/5 mL (as trihydrate) when reconstituted

APO-Amoxi, Gen-Amoxicillin, Lin-Amox, Novamoxin, Nu-Amoxi

Acimox, Aclimafel, Acroxil, Amoxifur, Amoxinovag, Amoxisol, Amoxivet, Ampliron, Ardine, Eumetinex, Flemoxon, Gimalxina, Grunicina, Hidramox, Moxlin, Penamox, Polymox, Servamox, Solciclina, Xalyn-Or

Drug Class: Antibiotic, penicillin

PHARMACOLOGY

Action

Inhibits bacterial cell wall mucopeptide synthesis.

Uses

Treatment of ear, nose, throat, GU, skin and skin structure, lower respiratory tract, and acute uncomplicated gonorrhea infections caused by susceptible strains of specific organisms.

Contraindications

Hypersensitivity to penicillins, cephalosporins, or imipenem. Not used to treat severe pneumonia, empyema, bacteremia, pericarditis, meningitis, and purulent or septic arthritis during acute stage.

Usual Dosage

Orodental infections

Adults and Children weighing at least 40 kg:
Mild to Moderate Infections: *PO:* 500 mg q 12 hr or 250 mg q 8 hr.
Severe Infections: *PO:* 875 mg q 12 hr or 500 mg q 8 hr.

Children (older than 3 mo and weighing less than 40 kg):
Mild to Moderate Infections: *PO:* 25 mg/kg/day in divided doses q 12 hr or 20 mg/kg/day in divided doses q 8 hr.
Severe Infections: *PO:* 45 mg/kg/day in divided doses q 12 hr or 40 mg/kg/day in divided doses q 8 hr.

Moxatag Extended-Release Tablets

Adults and Children 12 yr of age and older: 775 mg qd with meals for 10 days.

Pharmacokinetics

ABSORP: Rapidly absorbed. T_{max} is 1 to 2 hr; C_{max} is 3.5 mcg/mL (250-mg dose), 5 mcg/mL (500-mg dose), and approximately 13.8 mcg/mL (875-mg dose).
DIST: Diffuses into most body tissues and fluids; penetration in CNS is poor unless meninges are inflamed. Approximately 20% protein bound.
METAB: Liver.

EXCRETE: $T_{1/2}$ is 61.3 min; approximately 60% excreted in the urine within 6 to 8 hr as unchanged drug.
PEAK: 1 to 2 hr.
DURATION: 6 to 8 hr.

DRUG INTERACTIONS

Warfarin or acenocoumarol: Increased anticoagulant effect (decreased metabolism)
- Avoid concurrent use.

Methotrexate: Possible methotrexate toxicity (decreased excretion)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Glossitis; stomatitis; discolored tongue; taste disturbance; dry mouth.
CNS: Dizziness; fatigue; insomnia; reversible hyperactivity.
CVS: Tachycardia; hypotension; syncope; palpitations; vasodilation.
GI: Gastritis; anorexia; nausea; vomiting; abdominal pain or cramps; epigastric distress; diarrhea or bloody diarrhea; rectal bleeding; flatulence; enterocolitis; pseudomembranous colitis.
MISC: Hyperthermia.

CLINICAL IMPLICATIONS

General

When prescribed by DDS:
- *Lactation:* Excreted in breast milk.
- *Hypersensitivity:* Reactions range from mild to life threatening. Use cautiously in cephalosporin-sensitive patients because of possible cross-allergenicity.
- *Superinfection:* May result in overgrowth of nonsusceptible bacterial or fungal organisms.
- *Overdosage:* Hyperexcitability, convulsions.
- Ensure patient knows how to take the drug, how long it should be taken, and to immediately report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset).
- Antibiotic-associated diarrhea can occur. Have patient contact DDS immediately if signs develop.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.

When prescribed by medical facility:
- Determine why drug is being taken. If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs.

Pregnancy Risk Category: Category B.

Oral Health Education

When prescribed by DDS:
- Instruct patient to time doses evenly over a 24-hr period.
- Inform patient that the medication works best on empty stomach but may be taken with food if there is GI upset.
- Instruct patient to increase fluid intake to 2,000 to 3,000 mL/day unless contraindicated.
- Advise patient to discard oral liquid preparations that are more than 14 days old.
- If therapy is changed because of allergic reaction, explain significance of penicillin allergy and inform patient of potential sensitivity to cephalosporins.
- Instruct patient to report the following symptoms to health care provider: rash, difficulty breathing.

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amoxicillin/clavulanate potassium (uh-MOX-ih-sil-in/CLAV-you-lah-nate poe-TASS-ee-uhm)

Synonym: clavulanate potassium/amoxicillin

Augmentin: Tablets: 250, 500, 875 mg amoxicillin and 125 mg clavulanic acid; Chewable tablets: 125 mg amoxicillin and 31.25 mg clavulanic acid, 200 mg

amoxicillin and 28.5 mg clavulanic acid, 250 mg amoxicillin and 62.5 mg clavulanic acid, 400 mg amoxicillin and 57 mg clavulanic acid; Powder for oral suspension: 125 mg amoxicillin and 31.25 mg clavulanic acid per 5 mL, 200 mg amoxicillin and 28.5 mg clavulanic acid per 5 mL, 250 mg amoxicillin and 62.5 mg clavulanic acid per 5 mL, 400 mg amoxicillin and 57 mg clavulanic acid per 5 mL

Augmentin ES-600: Powder for oral suspension: 600 mg amoxicillin (as trihydrate) and 42.9 mg clavulanic acid per 5 mL (as the potassium salt)

Augmentin XR: Tablets: 1,000 mg amoxicillin and 62.5 mg clavulanic acid

Apo-Amoxi-Clav, Clavulin, ratio-Amoxi Clav

Amoxiclav, Clavulin, Servamox Clv

Drug Class: Antibiotic, aminopenicillin

PHARMACOLOGY

Action

Amoxicillin inhibits bacterial cell wall mucopeptide synthesis. Clavulanic acid inactivates a wide range of beta-lactam enzymes found in bacteria resistant to penicillins and cephalosporins.

Uses

Treatment of infections of lower respiratory tract, otitis media, sinusitis, skin and skin structure infections, UTIs, and community-acquired pneumonia caused by susceptible microorganisms.

Contraindications

History of penicillin allergy; history of amoxicillin and clavulanate-associated cholestatic jaundice or liver disease. AUGMENTIN XR: Severe renal impairment (Ccr less than 30 mL/min); hemodialysis patients.

Usual Dosage

Strengths listed below are based on amoxicillin content.

AUGMENTIN TABLETS

Warning: Because 250- and 500-mg tablets contain the same amount of clavulanate, two 250-mg tablets are not equivalent to one 500-mg tablet.

ADULTS AND CHILDREN WEIGHING 40 KG OR MORE: *PO:* One 500-mg tablet q 12 hr or one 250-mg tablet q 8 hr. For more severe infections and infections of the respiratory tract, give one 875-mg tablet q 12 hr or one 500-mg tablet q 8 hr.

Adult patients with severely impaired renal function (glomerular filtration rate [GFR] 10 to 30 mL/min) should receive 500 mg or 250 mg q 12 hr, depending on severity of infection. Patients with GFR less than 10 mL/min should receive 500 mg or 250 mg q 24 hr, depending on severity of infection. Hemodialysis patients should receive 500 mg or 250 mg q 24 hr, depending on severity of infection. They should receive an additional dose during and at the end of dialysis.

AUGMENTIN EXTENDED-RELEASE TABLETS (XR)

Warning: Because Augmentin XR contains 62.5 mg of clavulanate, Augmentin tablets cannot be used to provide the same dosages as Augmentin XR.

ADULTS AND CHILDREN 16 YR OF AGE AND OLDER: *PO:* Recommended daily dose is 4,000 mg amoxicillin and 250 mg clavulanate potassium daily.

AUGMENTIN ORAL SUSPENSION AND CHEWABLE TABLETS

Warning: Augmentin ES-600 (5 mL) does not contain the same amount of clavulanic acid as any of the other Augmentin suspensions (5 mL). Therefore, Augmentin ES-600 and Augmentin are not interchangeable. Because Augmentin 250-mg chewable tablets and Augmentin 250-mg tablets do not contain the same amount of clavulanic acid, they are not interchangeable and should not be substituted for each other.

ADULTS: *PO:* See dose for Augmentin tablets.
Adults who have trouble swallowing may be given 125 mg per 5 mL or 250 mg per 5 mL suspension in place of the 500-mg tablet. The 200 mg per 5 mL suspension or the 400 mg per 5 mL suspension may be used in place of the 875-mg tablet.
CHILDREN WEIGHING 40 KG OR MORE: *PO:* Should be dosed according to the adult recommendations.

Pharmacokinetics

ABSORP: Rapidly absorbed. T_{max} is 1 to 2 hr; C_{max} is 3.5 mcg/mL (250 mg dose), 5 mcg/mL (500 mg dose), and approximately 13.8 mcg/mL (875 mg dose).
DIST: Diffuses into most body tissues and fluids; penetration in CNS is poor unless meninges are inflamed. Approximately 20% protein bound.
METAB: Liver.
EXCRET: $T_{1/2}$ is 61.3 min; approximately 60% excreted in the urine within 6 to 8 hr as unchanged drug.
PEAK: 1–2 hr.
DURATION: 6–8 hr.

DRUG INTERACTIONS

Anticoagulants, oral: Increased anticoagulant effect (decreased metabolism)
- Avoid concurrent use or monitor INR.

Contraceptives, oral: Possible decrease in effectiveness of contraceptive (mechanism unknown)
- Advise patient to use additional form of birth control.

ADVERSE EFFECTS

⚠ **ORAL:** Oral candidiasis.
CNS: Agitation; anxiety; behavioral changes; confusion; convulsions; dizziness; fatigue; headache; insomnia; reversible hyperactivity.
GI: Diarrhea/loose stools (9%); nausea (3%); vomiting (1%); abdominal pain or cramps; anorexia; bloody diarrhea; enterocolitis; epigastric distress; flatulence; gastritis; pseudomembranous colitis; rectal bleeding.
MISC: Hyperthermia; superinfection.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.

When prescribed by DDS:
- Ensure patient knows how to take the drug, how long it should be taken, and to immediately report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset). See Chapter 4: *Medical Management of Odontogenic Infections*.
- Antibiotic-associated diarrhea can occur. Have patient contact DDS immediately if signs develop.
- *Lactation:* Secreted into breast milk.
- *Children:* AUGMENTIN TABLETS: Safety and efficacy of 250-mg tablet not established in children weighing less than 40 kg. AUGMENTIN XR TABLETS: Safety and efficacy not established in children younger than 16 yr of age. AUGMENTIN ES-600: Safety and efficacy not established in children younger than 3 mo of age. Safety and efficacy has not been established for treatment of otitis media in infants and children 3 mo to 12 yr of age. AUGMENTIN ORAL SUSPENSION AND CHEWABLE TABLETS: Modify dosage for children younger than 12 wk of age.
- *Hypersensitivity:* Serious and sometimes fatal reactions have been reported in patients on penicillin therapy. Also, there are reports of severe reactions in patients treated with a cephalosporin who have a history of penicillin hypersensitivity.
- *Renal failure:* Dose reduction or q 12 hr recommended with severe impairment.

- *Hepatic failure:* Use with caution.
- *Superinfection:* May result in overgrowth of nonsusceptible bacterial or fungal organisms.
- *Adults:* Safety and efficacy of Augmentin ES-600 not established.
- *Mononucleosis patients:* Increased risk of skin rash. Use not recommended.
- *Phenylalanine:* Contains phenylalanine in 200- and 400-mg chewable tablets, 200 mg per 5 mL, 400 mg per 5 mL, and 600 mg per 5 mL oral suspensions.
- *Pseudomembranous colitis:* Consider the possibility in patients who develop diarrhea.
- *Overdosage:* Stomach and abdominal pain; vomiting; diarrhea; rash; hyperactivity; drowsiness; interstitial nephritis, resulting in oliguric renal failure; crystalluria, which may lead to renal failure.

Pregnancy Risk Category: Category B.

Oral Health Education

When prescribed by DDS:

- Inform patient that antibacterial drug regimens must be followed to completion.
- Explain name, dose, action, and potential side effects of drug.
- Review dosing schedule (q 8 or 12 hr) and prescribed length of therapy with patient or caregiver. Advise patient or caregiver that dose, dosing frequency, and duration of therapy are dependent on the site and cause of infection and strength of antibiotic being used.
- Reinforce to patient or caregiver the need to take exactly as prescribed and to complete the entire course of therapy, even if symptoms of infection have disappeared. Caution patient or caregiver that skipping doses or not completing the full course of therapy may allow the infection to worsen and increase the possibility that the bacteria will become resistant to the antibiotic and may cause infections that will not be treatable in the future.
- Instruct patient to take each dose at the start of a meal or snack to minimize intestinal side effects.
- Advise patient using the nonscored extended-release tablet to swallow tablet whole. Caution patient not to break, crush, or chew the tablet.
- Advise patient using the scored extended-release tablet that the tablet may be split and taken as 2 halves. Advise patient that half tablets should be swallowed whole. Caution patient not to crush, chew, or break half tablets.
- Instruct patient or caregiver administering suspension to do the following: keep suspension refrigerated; shake well before each use; use dosing syringe, dosing spoon, or dosing cup when measuring and administering dose; and discard any unused suspension at end of treatment period.
- Advise patient or caregiver using chewable tablets to swallow whole or crush or chew before swallowing. Advise patient or caregiver to follow each dose with water.
- Instruct patient to notify health care provider if infection does not appear to be improving or is worsening.
- Advise patient or caregiver to notify health care provider if severe diarrhea or diarrhea lasting 2 or 3 days occurs.
- Warn patient that diarrhea containing blood or pus may be a sign of a serious disorder and to seek medical care if noted and not try to treat at home.
- Advise patient or caregiver to report signs of superinfection to health care provider: black "furry" tongue, white patches in mouth, foul-smelling stools, or vaginal itching or discharge.
- Advise patient, family, or caregiver to discontinue therapy and contact health care provider immediately if skin rash, hives, itching, or shortness of breath occurs.
- Advise women to notify health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Instruct patient not to take any prescription or OTC medications, herbal preparations, or dietary supplements unless advised by health care provider.
- Caution women taking oral contraceptives that amoxicillin may make birth control pills less effective and to use nonhormonal forms of contraception during treatment and for several weeks following last dose.
- Advise patient or caregiver that follow-up examinations and laboratory tests may be required to monitor therapy and to keep appointments.

amphetamine and dextroamphetamine (am-FET-uh-meen DEX-troe-am-FET-uh-meen)

Synonym: amphetamine sulfate, aspartate; dextroamphetamine and amphetamine

Adderall, Adderall XR

Drug Class: CNS stimulant; Amphetamine

DEA Schedule: Schedule II

PHARMACOLOGY

Action

Activates noradrenergic neurons, causing CNS and respiratory stimulation; stimulates satiety center in brain, causing appetite suppression.

Uses

Narcolepsy; attention deficit hyperactivity disorder; short-term (i.e., no longer than a few weeks) exogenous obesity adjunct used only when alternative therapy has been ineffective.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; unpleasant taste.

CNS: Hyperactivity; dizziness; restlessness; tremors; insomnia; euphoria; headache.

CVS: Palpitations, hypertension, tachycardia, arrhythmia (high doses).

GI: Diarrhea; constipation; anorexia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Use local anesthetic agents with vasoconstrictors with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Patients with ADHD may have short attention spans; consider short appointment.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

ampicillin (am-pih-SILL-in)

Ampicillin Sodium: Powder for injection: 250 mg, 500 mg, 1 g, 2 g
Principen: Capsules: 250, 500 mg (as trihydrate); Powder for oral suspension: 125 mg/5 mL, 259 mg/5mL (as trihydrate) when reconstituted

APO-Ampi, Novo Ampicillin, Nu-Ampi

Anglopen, Binotal, Dibacilina, Flamicina, Lampicin, Marovilina, Omnipen, Pentrexyl, Sinaplin

Drug Class: Antibiotic, penicillin

PHARMACOLOGY

Action
Inhibits bacterial cell wall mucopeptide synthesis.

Uses
Treatment of respiratory, GI, and GU tract and soft tissue infections, bacterial meningitis and enterococcal endocarditis, septicemia and gonococcal infections caused by susceptible microorganisms.

Unlabeled Uses
Prophylaxis during cesarean section in certain high-risk patients.

Contraindications
Hypersensitivity to penicillins, cephalosporins, or imipenem. Oral form not used to treat severe pneumonia, empyema, bacteremia, pericarditis, meningitis, and purulent or septic arthritis during acute stage.

Pharmacokinetics
ABSORP: Well absorbed from GI tract. C_{max} is approximately 3 mcg/mL (500-mg capsules) and 3.4 mcg/mL (500-mg oral suspension). Food affects absorption; take on empty stomach.

DIST: Diffuses readily into most body tissues and fluids; penetrates into the cerebrospinal fluid and brain only when meninges are inflamed. Approximately 20% protein bound; excreted in breast milk.

EXCRET: Excreted largely unchanged in the urine.

SPECIAL POP: *Renal failure:* $T_{1/2}$ may be prolonged. Dosing interval adjustments may be necessary.

DRUG INTERACTIONS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Discolored tongue; glossitis; stomatitis; dry mouth; taste disturbance.

CVS: Thrombophlebitis at injection site; tachycardia; hypotension; syncope.

CNS: Dizziness; fatigue; insomnia; reversible hyperactivity; neurotoxicity (e.g., lethargy, neuromuscular irritability, hallucinations, convulsions, seizures).

GI: Diarrhea; pseudomembranous colitis.

MISC: Pain at injection site; hyperthermia.

CLINICAL IMPLICATIONS

General
- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs.
- Anticipate oral candidiasis when long-term use is reported.

Pregnancy Risk Category: Category B.

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amyl nitrite (A-mill NYE-trite)

Amyl Nitrite Aspirols, Amyl Nitrite Vaporole: Inhalant: 0.3 mL

Drug Class: Antianginal

PHARMACOLOGY

Action
Relaxes smooth muscle of venous and arterial vasculature.

Uses
Relief of angina pectoris.

Contraindications
Hypersensitivity to nitrates; pregnancy; severe anemia; closed-angle glaucoma; orthostatic hypotension; head trauma; cerebral hemorrhage.

Usual Dosage
ADULT: Inhalation 0.3 mL prn; 1 to 6 inhalations from 1 capsule are usually sufficient. May be repeated in 3 to 5 min.

Pharmacokinetics
EXCRET: Approximately 33% excreted in the urine.
ONSET: 0.5 min
DURATION: 3 to 5 min.

DRUG INTERACTIONS
Diazoxide: Severe hypotension (additive)
- Monitor clinical status.

Diltiazem: Hypotension (additive)
- Monitor clinical status.

ADVERSE EFFECTS
⚠ **ORAL:** Stinging of nasal mucosa.
CVS: Tachycardia; palpitations; hypotension; orthostatic hypotension; syncope; arrhythmias; edema.
CNS: Headache; apprehension; weakness; vertigo; dizziness; agitation; insomnia.
GI: Nausea; vomiting; diarrhea; dyspepsia.
RESP: Bronchitis; pneumonia.
MISC: Arthralgia; perspiration; pallor; cold sweat.

CLINICAL IMPLICATIONS

General
- This drug is used for emergency procedures related to unconsciousness in the dental office.
- *Children:* Safety and efficacy not established.
- *Angina:* May aggravate angina caused by hypertrophic cardiomyopathy.
- *Drug abuse:* May be abused for sexual stimulation or for effects of lightheadedness, dizziness, and euphoria.
- *Glaucoma:* May increase intraocular pressure.
- *Orthostatic hypotension:* May occur even with small doses; alcohol accentuates this reaction.
- *Withdrawal:* Dose is gradually reduced to prevent withdrawal reaction.
- *Overdosage:* Severe headache, severe hypotension, flushing, tachycardia, vertigo, confusion, syncope, nausea, slow breathing or dyspnea, cyanosis, metabolic acidosis, convulsions, coma, death.

Pregnancy Risk Category: Category X.

Oral Health Education
- Caution patient to avoid sudden position changes to prevent orthostatic hypotension.
- Instruct patient to avoid intake of alcoholic beverages or other CNS depressants and aspirin.

aprepitant (ap-REH-pih-tant)

Emend

Drug Class: Antiemetic; Antivertigo agent

PHARMACOLOGY

Action

Selective high-affinity antagonist of human substance P/neurokinin 1 receptors.

Uses

In combination with other antiemetic agents for the prevention of acute and delayed nausea and vomiting associated with initial and repeat courses of highly emetogenic cancer chemotherapy, including high-dose cisplatin; prevention of nausea and vomiting associated with initial and repeat courses of moderately emetogenic cancer chemotherapy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Benzodiazepines: Possible increased oral midazolam and probably alprazolam and triazolam toxicity (decreased metabolism)

- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Stomatitis (5%); mucous membrane disorder (3%).
CNS: Asthenia/fatigue (18%); headache (9%); dizziness (7%); insomnia (3%).
GI: Nausea (13%); anorexia, constipation, diarrhea (10%); dyspepsia, vomiting (8%); heartburn; epigastric discomfort, gastritis (4%).
RESP: Hiccups (11%).
MISC: Abdominal pain (5%); fever.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Malignancy*: Seek medical consultation to determine WBC and platelet count before invasive dental procedures, including periodontal debridement.
- If GI side effects occur, consider semisupine chair position.
- Advise products for palliative relief of oral manifestations (stomatitis, mucositis, xerostomia, etc.)
- Avoid prescribing opioids for dental pain. Acetaminophen is appropriate if GI bleeding is present.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.
- Teach patient importance of updating health and drug history if physician makes any changes in evaluation/drug regimens.

arformoterol tartrate (ar-for-MOE-ter-ole TAR-trate)

Brovana

Drug Class: Sympathomimetic

PHARMACOLOGY

Action

Relaxes bronchial smooth muscles.

Uses

Long-term maintenance treatment of bronchoconstriction in COPD, including bronchitis and emphysema.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Oral moniliasis, periodontal abscess.
CVS: Arteriosclerosis, atrial flutter, AV block, CHF, heart block, inverted T-wave, MI, QT interval prolongation, supraventricular tachycardia (less than 2%).
CNS: Agitation, cerebral infarct, circumoral paresthesia, hypokinesia, paralysis, somnolence, tremor (less than 2%).
GI: Diarrhea (6%); constipation, gastritis, melena, rectal hemorrhage (less than 2%).
RESP: Sinusitis (5%); dyspnea (4%); lung disorder, primarily pulmonary or chest congestion (2%); lung carcinoma, respiratory disorder, voice alteration (less than 2%).
MISC: Pain (8%); chest pain (7%); flu syndrome, peripheral edema (3%); abscess, allergic reaction, digitalis intoxication, fever, hernia, neoplasm, retroperitoneal hemorrhage (less than 2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Respiratory disease often involves use of a combination of inhalational drugs and orally administered drugs. Inhalation propellants may dry oral tissues when used chronically.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function. Uncontrolled disease is characterized by wheezing, coughing.
- Acute bronchoconstriction can occur during dental treatment, have bronchodilator inhaler available.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Chronic dry mouth is possible; anticipate candidiasis.

Oral Health Education

- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.
- Encourage patient to follow daily plaque control procedures for effective self-care.

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aripiprazole (A-rih-PIP-ray-zole)

Abilify

Drug Class: Atypical antipsychotic

PHARMACOLOGY

Action

Partial agonist at dopamine D_2 and serotonin 5-HT_{1A} receptors, and antagonist at serotonin 5-HT_{2A} receptors.

Uses

Treatment of schizophrenia; treatment of acute manic and mixed episodes associated with bipolar disorder.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Increased salivation (>1%).
CNS: Headache (32%); anxiety, agitation (25%); insomnia (24%); akathisia, somnolence (12%); lightheadedness (11%); extrapyramidal syndrome (6%); tremor (4%); depression,

nervousness, hostility, suicidal thought, manic reaction, abnormal gait, confusion, cogwheel rigidity (≥1%).

GI: Nausea (16%); dyspepsia (15%); vomiting (12%); constipation (11%); anorexia (≥1%).

RESP: Coughing (3%); dyspnea, pneumonia (≥1%).

MISC: Asthenia (8%); accidental injury (5%); myalgia (4%); fever (2%); flu-like symptoms, peripheral edema, chest pain, neck pain, neck rigidity, muscle cramp (≥1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage patient to follow daily plaque control procedures for effective self-care.
- Evaluate manual dexterity; consider need for power toothbrush.

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armodafinil (ar-moe-DAF-in-il)

Nuvigil

Drug Class: Analeptic

PHARMACOLOGY

Action

Wakefulness-promoting agent; however, the precise mechanism is unknown.

Uses

Improve wakefulness in patients with excessive sleepiness associated with obstructive sleep apnea/hypopnea syndrome, narcolepsy, and shift work sleep disorder.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (7%).

CVS: Palpitations (2%); increased heart rate (1%).

CNS: Headache (23%); insomnia (6%); dizziness (5%); anxiety (4%); depression (3%); fatigue (2%); agitation, attention disturbance, decreased appetite, depressed mood, migraine, nervousness, paresthesia, pyrexia, thirst, tremor (1%).

GI: Nausea (9%); diarrhea (4%); dyspepsia, upper abdominal pain (2%); anorexia, constipation, loose stools, vomiting (1%).

RESP: Dyspnea (1%).

MISC: Influenza-like illness, pain, seasonal allergy (1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.

articaine HCl (AR-ti-kane HIGH-droe-KLOR-ide)

Septocaine, Zorcaine 4%: Injection: 4% with 1:100,000 epinephrine
Ultracaine DS Forte: Injection: 4% with 1:200,000 epinephrine

Astracaine, Astracaine Forte, Ultracaine-DS

PHARMACOLOGY

Action

Inhibits sodium ion fluxes across membrane to block nerve action potential.

Uses

For local, infiltrative, or conductive anesthesia in simple and complex dental and periodontal procedures.

Contraindications

Hypersensitivity to local anesthetics or any components of the products, para-aminobenzoic acid (esters only) or parabens; congenital or idiopathic methemoglobinemia.

Usual Dosage

To prevent pain during dental procedures

INJECTION

ADULTS: The dose of local anesthetic administered varies with the procedure, vascularity of the tissues, depth of anesthesia, degree of required muscle relaxation, duration of anesthesia desired, and the physical condition of the patient. Not to exceed 7 mg/kg of body weight.

CHILDREN: Articaine is not indicated in children younger than 4 yr of age. For children older than 4 yr, not to exceed 7 mg/kg of body weight.

Pharmacokinetics

METAB: Plasma carboxylesterase and liver (P450 enzymes 5% to 10%).

EXCRET: Urinary.

ONSET: 1 to 6 min.

DURATION: 1 hr.

SPECIAL POP: Repeated doses may cause accumulation of the drug or its metabolites or slow metabolic degradation. Give reduced doses. Use anesthetics with caution in patients with severe disturbances of cardiac rhythm, hypotension, shock, or heart block. Also, use local anesthetics with caution in patients with impaired cardiovascular function because they may be less able to compensate for functional changes associated with the prolongation of AV conduction produced by these drugs.

Elderly: Repeated doses may cause accumulation of the drug or its metabolites or slow metabolic degradation; give reduced doses.

Hepatic failure: Because amide-type local anesthetics are metabolized primarily in the liver and ester-type local anesthetics are hydrolyzed by plasma cholinesterase produced by the liver, patients with hepatic disease, especially severe hepatic disease, may be more susceptible to potential toxicity. Use cautiously in such patients.

DRUG INTERACTIONS

No documented drug-drug interactions significant to dentistry. The absence of evidence is not evidence of safety.

Intercurrent use: Mixtures of local anesthetics are sometimes employed to compensate for the slower onset of one drug and the shorter duration of action of the second drug. Toxicity is probably additive with mixtures of local anesthetics, but some experiments suggest

synergy. Exercise caution regarding toxic equivalence when mixtures of local anesthetics are employed. Some preparations contain vasoconstrictors. Keep this in mind when using concurrently with other drugs that may interact with vasoconstrictors.

Sedatives: If employed to reduce patient apprehension during dental procedures, use reduced doses, since local anesthetics used in combination with CNS depressants may have additive effects. Give young children minimal doses of each agent.

ADVERSE EFFECTS

⚠ **ORAL:** Injection site reactions; dry mouth; increased salivation; glossitis; gingival hemorrhage; mouth ulceration; stomatitis; tongue edema; tooth disorder.

CNS: Dizziness; facial paralysis; hyperesthesia; nervousness; neuropathy; paresthesia; somnolence.

CVS: Hemorrhage; migraine; syncope; tachycardia.

GI: Abdominal pain; constipation; diarrhea; dyspepsia; nausea; vomiting.

RESP: Pharyngitis; rhinitis.

MISC: Accidental injury; asthenia; back pain; dysmenorrhea; injection site pain; malaise; neck pain.

CLINICAL IMPLICATIONS

General

- *Dosage:* Use the lowest dosage that results in effective anesthesia to avoid high plasma levels and serious adverse effects. Inject slowly, with frequent aspirations before and during the injection, to avoid intravascular injection. Perform syringe aspirations before and during each supplemental injection in continuous (intermittent) catheter techniques. During the administration of epidural anesthesia, it is recommended that a test dose be administered initially and that the patient be monitored for CNS toxicity and cardiovascular toxicity, as well as for signs of unintended intrathecal administration, before proceeding.
- *Inflammation or sepsis:* Use local anesthetic procedures with caution when there is inflammation or sepsis in the region of proposed injection.
- *CNS toxicity:* Monitor cardiovascular and respiratory vital signs and state of consciousness after each injection. Restlessness, anxiety, incoherent speech, lightheadedness, numbness, and tingling of the mouth and lips, metallic taste, tinnitus, dizziness, blurred vision, tremors, twitching, depression, or drowsiness may be early signs of CNS toxicity.
- *Malignant hyperthermia:* Many drugs used during anesthesia are considered potential triggering agents for familial malignant hyperthermia. It is not known whether local anesthetics may trigger this reaction and the need for supplemental general anesthesia cannot be predicted in advance; therefore, have a standard protocol for management available.
- *Vasoconstrictors:* Use solutions containing a vasoconstrictor with caution and in carefully circumscribed quantities in areas of the body supplied by end arteries or having otherwise compromised blood supply (e.g., digits, nose, external ear, penis). Use with extreme caution in patients whose medical history and physical evaluation suggest the existence of hypertension, peripheral vascular disease, arteriosclerotic heart disease, cerebral vascular insufficiency, or heart block; these individuals may exhibit exaggerated vasoconstrictor response. Serious dose-related cardiac arrhythmias may occur if preparations containing a vasoconstrictor such as epinephrine are employed in patients during or following the administration of potent inhalation agents.
- *Lactation:* Safety for use in the nursing mother has not been established.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) prior to using vasoconstrictor to assess CV status. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.

Pregnancy Risk Category: Category C. Safety for use in pregnant women, other than those in labor, has not been established. Local anesthetics rapidly cross the placenta.

Oral Health Education

- Advise the patient to exert caution to avoid inadvertent trauma to the lips, tongue, cheek, mucosae, or soft palate when these structures are anesthetized. The ingestion of food should therefore be postponed until normal function returns.
- Advise the patient to consult the dentist if anesthesia persists or a rash develops.

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aspirin (ASS-pihr-in)

Synonym: acetylsalicylic acid; ASA

Arthritis Foundation Pain Reliever, Aspergum, Bayer Children's Aspirin, Bayer Low Adult Strength, Easprin, Ecotrin, Ecotrin Adult Low Strength, Ecotrin Maximum Strength, Empirin, Extended Release Bayer 8-Hour, Extra Strength Bayer Enteric 500 Aspirin, Genprin, Genuine Bayer, 1/2 Halfprin, Halfprin 81, Heartline, Maximum Bayer, Norwich Extra-Strength, St. Joseph Adult Chewable Aspirin, ZORprin: Tablets: 325, 500 mg; Chewable tablets: 81 mg; Enteric-coated tablets: 81, 165, 325, 500 mg; Delayed-release tablets: 81 mg; Controlled-release tablets: 800 mg; Gum: 227.5 mg

Alka-Seltzer Flavoured, Asaphen, Asaphen E.C., Entrophen, MSD Enteric Coated ASA, Novasen

ASA 500, Aspirina Protect

Drug Class: Analgesic; Salicylate

PHARMACOLOGY

Action

Inhibits prostaglandin synthesis, resulting in analgesia, anti-inflammatory activity, and platelet aggregation inhibition; reduces fever by acting on the brain's heat-regulating center to promote vasodilation and sweating.

Uses

Treatment of mild to moderate pain; fever; various inflammatory conditions; reduction of risk of death or MI in patients with previous infarction or unstable angina pectoris or recurrent transient ischemia attacks or stroke in men who have had transient brain ischemia caused by platelet emboli.

Unlabeled Uses

Prevention of cataract formation; prevention of toxemia of pregnancy; improvement of inadequate uteroplacental blood flow in pregnancy.

Contraindications

Hypersensitivity to salicylates or NSAIDs; hemophilia, bleeding ulcers, or hemorrhagic states.

Usual Dosage

Analgesic/antipyretic

ADULTS: *PO:* 325 to 650 mg q 4 hr; 500 mg q 3 hr; 1000 mg q 6 hr.
CHILDREN (2 TO 12 YR): *PO:* 10 to 15 mg/kg/dose q 4 hr (up to 80 mg/kg/day).

Pharmacokinetics

ABSORP: Rapidly and completely absorbed. T_{max} is 1 to 2 hr (salicylic acid).
DIST: Widely distributed to all tissues and fluids including CNS, breast milk, and fetal tissues. Approximately 90% of salicylate is protein bound at concentrations of less than 100 mcg/mL and approximately 75% is bound at concentrations of more than 400 mcg/mL.
METAB: Rapidly hydrolyzed to salicylic acid (active). Salicylic acid is conjugated in the liver to the metabolites.

EXCRET: Salicylic acid plasma $t_{1/2}$ is approximately 6 hr but may exceed 20 hr in higher doses. $T_{1/2}$ is approximately 15 to 20 min for aspirin. Elimination follows zero-order kinetics. Renal elimination of unchanged drug depends on urine pH. A pH of more than 6.5 increases renal clearance of free salicylate from less than 5% to more than 80%.

DRUG INTERACTIONS

Angiotensin-converting enzyme inhibitors: Decreased antihypertensive effect (inhibition of prostaglandin synthesis)
- Monitor blood pressure.

Anticoagulants, oral: Increased bleeding (platelet inhibition)
- Avoid concurrent use.

Cimetidine or nizatidine: Possible salicylate toxicity (decreased metabolism)
- Avoid concurrent use.

Clopidogrel: Increased gastrointestinal bleeding (additive effect on platelet function)
- Avoid concurrent use.

Heparin: Increased bleeding (platelet inhibition)
- Avoid concurrent use.

Ibuprofen: Inhibition of antiplatelet effect of aspirin (blocks access to active site on platelets)
- Avoid concurrent use.

Lithium: Lithium toxicity (decreased renal excretion)
- Avoid concurrent use.

Methotrexate: Possible methotrexate toxicity (decreased renal clearance)
- Avoid concurrent use.

Quinidine: Increased bleeding (additive antiplatelet effect)
- Avoid concurrent use.

Spironolactone: Decreased antihypertensive effect (inhibition of prostaglandin synthesis)
- Monitor blood pressure.

Valproate: Possible valproate toxicity (displacement from binding site)
- Avoid concurrent use.

Zafirlukast: Possible zafirlukast toxicity (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Increased bleeding.

GI: Nausea; dyspepsia; heartburn; bleeding.

MISC: Hypersensitivity reactions may include urticaria, hives, rashes, angioedema, and anaphylactic shock.

CLINICAL IMPLICATIONS

General

When recommended by DDS:
- *Lactation:* Excreted in breast milk.
- *Children:* Reye syndrome has been associated with aspirin administration to children (including teenagers) with acute febrile (viral) illness.
- *Hypersensitivity:* Reaction may include bronchospasm and generalized urticaria or angioedema; patients with asthma or nasal polyps have greatest risk.
- *Renal failure:* May decrease renal function or aggravate kidney diseases.
- *Hepatic failure:* May cause hepatotoxicity in patients with impaired liver function.
- *GI disorders:* Can cause gastric irritation and bleeding.
- *Surgical patients:* Aspirin may increase risk of postoperative bleeding. If possible, avoid use 1 wk before surgery. No significantly increased risk of hemorrhage after oral surgery.
- *Overdosage:* Nausea, vomiting, tinnitus, dizziness, respiratory alkalosis, metabolic acidosis, hemorrhage, convulsions.

Pregnancy Risk Category: Category D.

Oral Health Education

When recommended by DDS:

- Instruct patient to take drug with food or after meals and with full glass of water. Explain that antacids should be avoided within 1 to 2 hr after ingestion of enteric-coated tablets.
- Instruct patient to report ringing in ears or unusual bleeding, bruising, or persistent GI pain.
- Tell patient on sodium-restricted diet to limit use of effervescent or buffered aspirin preparations.
- Caution parents to avoid giving aspirin to children or teenagers with flu-like symptoms or chickenpox without first consulting health care provider.
- Instruct patient to avoid intake of alcoholic beverages or other CNS depressants.

aspirin/codeine phosphate (ASS-pihr-in/KOE-deen FOSS-fate)

Synonym: ASA/codeine phosphate; codeine phosphate/ASA; codeine phosphate/aspirin

Empirin with Codeine #2: Tablet: Aspirin 325 mg and codeine 15 mg
Empirin with Codeine #3: Tablet: Aspirin 325 mg and codeine 30 mg
Empirin with Codeine #4: Tablet: Aspirin 325 mg and codeine 60 mg

Drug Class: Narcotic analgesic combined with nonsteroidal anti-inflammatory analgesic

DEA Schedule: Schedule III

PHARMACOLOGY

Uses

Relief of mild to moderate pain.

Contraindications

Hypersensitivity to local anesthetics or any components of the products, para-aminobenzoic acid (esters only), or parabens; congenital or idiopathic methemoglobinemia; spinal and caudal anesthesia in septicemia; existing neurologic disease; spinal deformities; severe hypertension; hemorrhage; shock; or heart block.

Usual Dosage

Mild to moderate pain

ADULTS: One to 2 tablets every 4 to 6 hr; not to exceed 12 tablets in a 24-hr period.
CHILDREN: Not recommended for pediatric use.

Pharmacokinetics

Aspirin

ABSORP: Rapidly and completely absorbed. T_{max} is 1 to 2 hr (salicylic acid).
DIST: Widely distributed to all tissues and fluids including CNS, breast milk, and fetal tissues. Approximately 90% of salicylate is protein bound at concentrations of less than 100 mcg/mL and approximately 75% is bound at concentrations of more than 400 mcg/mL.
METAB: Rapidly hydrolyzed to salicylic acid (active). Salicylic acid is conjugated in the liver to the metabolites.
EXCRET: Salicylic acid plasma $t_{1/2}$ is approximately 6 hr but may exceed 20 hr in higher doses. $T_{1/2}$ is approximately 15 to 20 min for aspirin. Elimination follows zero order kinetics. Renal elimination of unchanged drug depends on urine pH. A pH of more than 6.5 increases renal clearance of free salicylate from less than 5% to more than 80%.

Codeine

METAB: Metabolized in the liver by undergoing *O*-demethylation, *N*-demethylation, and partial conjugation.
EXCRET: Excreted in the urine, largely as inactive metabolites, and small amounts of free and conjugated morphine. The $t_{1/2}$ is 3 hr.

ONSET: *Oral/SC*: 15 to 30 min.
PEAK: *Oral*: 60 min.
DURATION: *Oral/SC*: 4 to 6 hr.

DRUG INTERACTIONS

See also: aspirin — Drug Interactions
Codeine is additive with other CNS depressants
Bupivacaine: Possible respiratory depression (mechanism unknown)
- Use bupivacaine with caution.

ADVERSE EFFECTS

⚠ **ORAL:** Taste alteration, dry mouth, dysphagia (codeine); gingival bleeding (ASA).
CNS: Lightheadedness; dizziness; sedation; disorientation; incoordination; euphoria; delirium.
CVS: Bradycardia; postural hypotension; arrhythmia.
GI: Nausea, vomiting, abdominal pain, constipation, anorexia, biliary tract spasm (codeine); nausea, dyspepsia, abdominal pain, bleeding (ASA).
MISC: Tolerance; psychological and physical dependence with chronic use (codeine); hypersensitivity skin reactions such as rash, edema, urticaria, anaphylaxis, angioedema (ASA).

CLINICAL IMPLICATIONS

General

- *Lactation:* Undetermined.
- Assess patient for GI and general side effects. Inform health care provider if noted and significant.
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If oral pain requires additional analgesics, consider nonopioid products.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- *When prescribed by DDS:* Short-term use only; there is no justification for long-term use in the management of dental pain.
- *Geriatric patients:* Use lower dose of opioid.

Pregnancy Risk Category: Category C (codeine); category D (ASA).

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- *When prescribed by DDS:* Warn patient not to drive, sign important papers, or operate mechanical equipment.

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aspirin/dipyridamole (ASS-pihr-in/dye-peer-ID-a-mole)

Synonym: dipyridamole/aspirin

Aggrenox

Drug Class: Antiplatelet

PHARMACOLOGY

Action

Antithrombotic action resulting from additive antiplatelet effects.

Uses

Reduces the risk of stroke in patients who have had transient ischemia of the brain or complete ischemic stroke caused by thrombosis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ibuprofen: Inhibits the antiplatelet effect of aspirin (blocks receptor site)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Taste loss.

CNS: Headache; amnesia; convulsions; anorexia; somnolence; confusion; coma; cerebral, subarachnoid, and intracranial hemorrhage; fatigue (5.8%).

CVS: Hypotension, tachycardia, palpitation, arrhythmia (<1%); syncope.

GI: Abdominal pain; dyspepsia; nausea; vomiting; diarrhea; melena; rectal hemorrhage; GI hemorrhage; hemorrhoids; perforation; Reye syndrome.

RESP: Coughing; URI.

MISC: Arthralgia; arthritis; myalgia; arthrosis; pain; back pain; asthenia; neoplasm; malaise; anaphylaxis; laryngeal edema; rhabdomyolysis; hemorrhage (3.2%), epistaxis (2.4%), thrombocytopenia, purpura, prolonged PT.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine bleeding time before completing procedures that may result in significant bleeding. Safe levels are <20 min.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Monitor vital signs.
- If GI side effects or back pain occur, consider semisupine chair position.
- If uncontrolled bleeding develops, use hemostatic agents and positive pressure to induce hemostasis. Do not dismiss patient until bleeding is controlled.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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aspirin/hydrocodone bitartrate (ASS-pihr-in/HIGH-droe-KOE-dohn by-TAR-TRATE)

Synonym: hydrocodone bitartrate/aspirin

Alor 5/500, Lortab ASA, Panasol 5/500: Tablets: 5 mg hydrocodone bitartrate, 500 mg ASA

Drug Class: Opioid Analgesic Combination

DEA Schedule: Schedule III

Usual Dosage

Odontogenic pain

TABLETS

ADULTS: Two tablets every four to six hr (maximum 8 tablets in 24 hr).

Pharmacokinetics

Aspirin

ABSORP: Rapidly and completely absorbed. T_{max} is 1 to 2 hr (salicylic acid).

DIST: Widely distributed to all tissues and fluids including CNS, breast milk, and fetal tissues. Approximately 90% of salicylate is protein bound at concentrations of less than 100 mcg/mL and approximately 75% is bound at concentrations of more than 400 mcg/mL.

METAB: Rapidly hydrolyzed to salicylic acid (active). Salicylic acid is conjugated in the liver to the metabolites.

EXCRET: Salicylic acid plasma $t_{1/2}$ is approximately 6 hr but may exceed 20 hr in higher doses. $T_{1/2}$ is approximately 15 to 20 min for aspirin. Elimination follows zero-order kinetics. Renal elimination of unchanged drug depends on urine pH. A pH of more than 6.5 increases renal clearance of free salicylate from less than 5% to more than 80%.

Hydrocodone

ABSORP: Hydrocodone is rapidly absorbed from the GI tract. T_{max} is achieved at 1.7 hr.
DIST: Distributed throughout the body. Not extensively protein bound.
METAB: Extensively metabolized in the liver to hydromorphone by *O*-demethylation by the CYP2D6 isoenzyme.
EXCRET: Hydrocodone and its metabolites are eliminated primarily in the kidneys.
ONSET: 30 min.
PEAK: 1.7 hr.
DURATION: 4.5 hr.
SPECIAL POP: *Severe renal insufficiency:* The effect of renal insufficiency on the pharmacokinetics of hydrocodone has not been determined.

DRUG INTERACTIONS

See also: acetaminophen – Drug Interactions

No specific documented drug-drug interactions with hydrocodone. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; bleeding.
CNS: Dizziness; lightheadedness; euphoria; dysphoria; convulsions (overdose).
CVS: Circulatory depression; palpitations; changes in blood pressure.
GI: Nausea; vomiting.
RESP: Respiratory depression.
MISC: Tinnitus; blurred vision; miosis.

CLINICAL IMPLICATIONS

General

- Monitor vital signs.
- *Elderly:* Use lower dose of opioid.
- *When prescribed by DDS:* Short-term use only; there is no justification for long-term use in the management of dental pain.

Pregnancy Risk Category: Category C.

Oral Health Education

- *When prescribed by DDS:* Warn patient not to drive, sign important papers, or operate mechanical equipment.

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aspirin/oxycodone HCl (ASS-pihr-in/OX-ee-KOE-dohn HIGH-droe-KLOR-ide)

Synonym: oxycodone HCl/aspirin

Percodan: Tablets: 4.5 mg oxycodone HCl/ 0.38 mg oxycodone terephthalate/ 325 mg aspirin

ratio-Oxycodan

Drug Class: Narcotic analgesic
DEA Schedule: Schedule II

PHARMACOLOGY

Action

OXYCODONE: Relieves pain by stimulating opiate receptors in CNS.
ASPIRIN: Inhibits prostaglandin synthesis, resulting in analgesia, anti-inflammatory activity, and inhibition of platelet aggregation.

Uses
For the relief of moderate to moderately severe pain.

Contraindications
Hypersensitivity to any component of the product.

Usual Dosage
ADULTS: *PO:* Usual dose is 1 tablet q 6 hr prn for pain (max, 12 tablets [4 g aspirin] q 24 hr).

Pharmacokinetics
Aspirin
ABSORP: Rapidly and completely absorbed. T_{max} is 1 to 2 hr (salicylic acid).
DIST: Widely distributed to all tissues and fluids including CNS, breast milk, and fetal tissues. Approximately 90% of salicylate is protein bound at concentrations of less than 100 mcg/mL and approximately 75% is bound at concentrations of more than 400 mcg/mL.
METAB: Rapidly hydrolyzed to salicylic acid (active). Salicylic acid is conjugated in the liver to the metabolites.
EXCRET: Salicylic acid plasma $t_{1/2}$ is approximately 6 hr but may exceed 20 hr in higher doses. $T_{1/2}$ is approximately 15 to 20 min for aspirin. Elimination follows zero order kinetics. Renal elimination of unchanged drug depends on urine pH. A pH of more than 6.5 increases renal clearance of free salicylate from less than 5% to more than 80%.

Oxycodone
ABSORP: High oral availability due to low presystemic or first-pass metabolism. Exhibits a biphasic absorption pattern. The immediate-release oral bioavailability is 100%. The oral bioavailability is 60% to 87%. Peak plasma concentration increased by 25% with a high-fat meal. Once absorbed, it is distributed to skeletal muscle, liver, intestinal tract, lungs, spleen, and brain.
DIST: The Vd is 2.6 L/kg (IV). It is found in breast milk.
METAB: Extensively metabolized in the liver to noroxycodone (a major metabolite), oxymorphone, and their glucuronides.
EXCRET: Excreted through the urine, with less than 19% as free oxycodone, less than 50% as conjugated oxycodone, and less than 14% as conjugated oxymorphone. The $t_{1/2}$ for immediate release is 0.4 hr. Clearance is 0.8 L/min. Elimination on $t_{1/2}$ is 3.2 hr (immediate release).
ONSET: 15 to 30 min.
PEAK: 1 hr.
DURATION: 4 to 6 hr.
SPECIAL POP: *Severe renal insufficiency:* For less than 60 mL/min, higher peak plasma oxycodone (50%), and noroxycodone (20%), higher AUC for oxycodone (60%), noroxycodone (50%), oxymorphone (40%). There is an increased $t_{1/2}$ of oxycodone elimination of only 1 hr.
Mild to moderate hepatic insufficiency: Peak plasma oxycodone and noroxycodone concentrations 50% and 20% higher; AUC values are 95% and 65% higher, respectively. Oxymorphone peak plasma concentration and AUC values are lower by 30% and 40%. The $t_{1/2}$ elimination for oxycodone is increased by 2.3 hr.

DRUG INTERACTIONS
See also: aspirin — Drug Interactions
Sertraline: Possible increased risk of serotonin syndrome (mechanism unknown)
- Monitor clinical status.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth, increased bleeding.
CNS: Lightheadedness; dizziness; sedation; euphoria; dysphoria.
CVS: Hypotension; bradycardia; tachycardia.
GI: Nausea; vomiting; constipation.
RESP: Dyspnea; respiratory depression.
MISC: Malaise; tolerance; psychological and physical dependence with chronic use.

CLINICAL IMPLICATIONS

General

When prescribed by DDS:

- Short-term use only; there is no justification for long-term use in the management of dental pain.
- If oral pain requires additional analgesics, consider nonopioid products.
- *Children:* Safety and efficacy not established. Reye syndrome has been associated with aspirin administration to children (including teenagers) with acute febrile illness.
- *Special risk:* Use with caution in the elderly or debilitated and in patients with severe impairment of hepatic or renal function, peptic ulcers, hypothyroidism, Addison disease, and prostatic hypertrophy or urethral stricture.
- *Acute abdominal conditions:* Diagnosis or clinical course may be obscured.
- *Ambulatory patients:* Mental and physical abilities may be impaired.
- *Dependency:* Oxycodone has abuse potential.
- *Peptic ulcers:* Use with caution in the presence of peptic ulcer.
- *Overdosage:* Respiratory depression, extreme somnolence progressing to stupor or coma, skeletal muscle flaccidity, cold and clammy skin, bradycardia, hypotension, apnea, circulatory collapse, cardiac arrest, death.

When prescribed by medical facility:

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Pregnancy Risk Category: Category B. Category D if used for prolonged periods.

Oral Health Education

When prescribed by DDS:

- Explain name, dose, action, and potential side effects of drug.
- Advise patient to take 1 tablet q 6 hr or as prescribed if needed for pain but to not take more than 12 tablets in 24 hr.
- Advise patient to take without regard to meals but to take with food if GI upset occurs.
- Instruct patient to avoid alcoholic beverages and other depressants while taking this medication.
- Advise patient that drug may impair judgment, thinking, or motor skills or cause drowsiness, and to use caution while driving or performing other tasks requiring mental alertness until tolerance is determined.
- Advise patient to stop taking the drug and notify health care provider if any of the following occurs: allergic reaction; unusual bleeding or bruising; shortness of breath; black or tarry stools; vomiting of blood or coffee grounds–like material; excessive sedation.
- Advise women to notify health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Warn patient not to take any prescription or OTC drugs or dietary supplements without consulting health care provider.
- Advise patient that follow-up visits may be necessary to monitor therapy and to keep appointments.

When prescribed by medical facility:

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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atazanavir sulfate (At-ah-zah-NAH-veer SULL-fate)

Reyataz

Drug Class: Antiviral

PHARMACOLOGY

Action

Inhibits human immunodeficiency virus (HIV) protease, the enzyme required to form functional proteins in HIV-infected cells.

Uses
In combination with other antiretroviral agents for the treatment of HIV-1 infection.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Aphthous stomatitis; dental pain (unspecified); esophageal ulcer; esophagitis.
CNS: Headache (14%); depression (4%); dizziness, insomnia (3%); peripheral neurological symptoms (1%); abnormal dreams; abnormal gait; agitation; amnesia; anxiety; confusion; convulsion; decreased libido; emotional lability; hallucination; hostility; hyperkinesia; hypesthesia; increased reflexes; nervousness; psychosis; sleep disorder; somnolence; suicide attempt; twitch.
GI: Nausea (16%); vomiting, abdominal pain, diarrhea (6%); acholia; anorexia; colitis; constipation; dyspepsia; enlarged abdomen; flatulence; gastritis; gastroenteritis; GI disorder; hepatitis; hepatomegaly; hepatosplenomegaly, increased appetite; liver damage; liver fatty deposit; pancreatitis; peptic ulcer.
RESP: Increased cough; dyspnea; hiccup; hypoxia.
MISC: Rash (9%); fever (4%); increased cough, pain (3%); back pain, fatigue (2%); lipodystrophy (1%); bone pain; extremity pain; muscle atrophy; myalgia; myasthenia; myopathy; allergic reactions; angioedema; asthenia; burning sensation; chest pain; dysplasia; ecchymosis; edema; facial atrophy; generalized edema; heat sensitivity; infection; malaise; pallor; peripheral edema; photosensitivity; purpura; substernal chest pain; sweating.

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- Anticipate oral candidiasis when HIV disease is reported.
- If GI side effects occur, consider semisupine chair position.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values improve above this level.

Oral Health Education
- Recommend frequent maintenance prophylaxis when immunosuppression is evident.
- Encourage daily plaque control procedures for effective self-care since HIV infection reduces host resistance.

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atenolol (ah-TEN-oh-lahl)
Tenormin

Apo-Atenol, Gen-Atenolol, Med-Atenolol, Novo-Atenol, Nu-Atenol, PMS-Atenolol, ratio-Atenolol, Rhoxal-atenolol

Blokium, Tenormin

Drug Class: Beta$_1$-adrenergic blocker

PHARMACOLOGY
Action
Blocks beta$_1$ receptors, primarily affecting heart (slows rate), vascular system (decreases BP), and, to a lesser extent, lungs (reduces function).

Uses
Treatment of hypertension (used alone or in combination with other drugs), angina pectoris resulting from coronary atherosclerosis, acute MI.

Unlabeled Uses

Migraine prophylaxis; alcohol withdrawal syndrome; ventricular arrhythmias; supraventricular arrhythmias or tachycardias; esophageal varices rebleeding; anxiety.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Nonsteroidal anti-inflammatory drugs: Decreased antihypertensive effect (inhibition of prostaglandin synthesis)

- Monitor blood pressure.

Sympathomimetic amines: Decreased antihypertensive effect with epinephrine (pharmacological antagonism)

- Monitor blood pressure. Use local anesthetic agents with vasoconstrictor with caution.

Hypertensive reactions with epinephrine (unopposed alpha-adrenergic stimulation)

- Monitor blood pressure. Use local anesthetic agents with vasoconstrictor with caution.

Decreased antianaphylactic effect of epinephrine (beta blockade)

- Increase epinephrine dosage may be required in anaphylaxis.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disturbance; taste loss.

CNS: Insomnia; fatigue; dizziness; depression; lethargy; drowsiness; forgetfulness; slurred speech.

CVS: Hypotension; bradycardia; arrhythmia; postural hypotension.

GI: Nausea; vomiting; diarrhea.

RESP: Bronchospasm; dyspnea; wheezing.

MISC: Weight changes; facial swelling; muscle weakness; hyperglycemia; hypoglycemia; antinuclear antibodies; hyperlipidemia.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions.
- Chronic dry mouth is possible. Anticipate increased caries, candidiasis, and lichenoid mucositis.
- If GI side effects occur, consider semisupine chair position.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Beta blockers may mask epinephrine-induced signs and symptoms of hypoglycemia in patient with diabetes.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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atomoxetine (AT-oh-MOX-ah-teen)

Strattera

Drug Class: Psychotherapeutic

PHARMACOLOGY

Action

Selective inhibition of the presynaptic norepinephrine transporter is suspected.

Uses

Treatment of attention deficit hyperactivity disorder (ADHD).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.
CNS: Aggression; irritability; somnolence; fatigue; dizziness; mood swings; headache; crying; fatigue; insomnia; sedation; depression; decreased libido; abnormal dreams; paresthesia; sleep disorder; sinus headache; lethargy.
GI: Vomiting; dyspepsia; nausea; abdominal pain; decreased appetite; constipation; diarrhea; anorexia; viral gastroenteritis; flatulence.
RESP: Cough; rhinorrhea; sinus congestion; upper respiratory tract infection.
MISC: Allergic hypersensitivity (e.g., angioneurotic edema, urticaria, rash); influenza; early morning awakening; tearfulness; arthralgia; tremor; myalgia; pyrexia; rigors; peripheral coldness.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Patients with ADHD may have a short attention span; consider short appointment.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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atorvastatin calcium (ah-TORE-vah-STAT-in KAL-see-uhm)

Lipitor

Drug Class: Antihyperlipidemic, HMG-CoA reductase inhibitor

PHARMACOLOGY

Action

Increases rate at which body removes cholesterol from blood and reduces production of cholesterol by inhibiting enzyme that catalyzes early rate-limiting step in cholesterol synthesis; increases HDL; reduces LDL, VLDL, and triglycerides.

Uses

Elevated serum triglyceride, heterozygous familial hypercholesterolemia in pediatric patients, homozygous familial hypercholesterolemia, hypercholesterolemia, type III familial hyperlipoproteinemia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Itraconazole: Possible atorvastatin toxicity (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

CNS: Headache (17%); insomnia, dizziness (≥2%).
GI: Diarrhea (4%); abdominal pain (4%); constipation (3%); nausea (≥2%).
RESP: Bronchitis (≥2%).
MISC: Back pain, asthenia, myalgia (4%); flu-like symptoms (3%); chest pain (≥2%); anaphylaxis, angioneurotic edema, bullous rashes (including erythema multiforme, Stevens-Johnson syndrome, toxic epidermal necrolysis), rhabdomyolysis.

CLINICAL IMPLICATIONS

General

- High LDL cholesterol concentration is the major cause of atherosclerosis that leads to CAD (angina, MI); determine degree of CV health and ability to withstand stress of dental treatment.

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

atovaquone (uh-TOE-vuh-KWONE)

Mepron

Drug Class: Anti-infective; Antiprotozoal

PHARMACOLOGY

Action

Inhibits mitochondrial electron transport in metabolic enzymes of microorganisms. This may cause inhibition of nucleic acid and adenosine triphosphate synthesis.

Uses

Treatment of mild to moderate *Pneumocystis carinii* pneumonia (PCP) in patients who are intolerant of trimethoprim-sulfamethoxazole and acute oral treatment of mild to moderate PCP in patients who are intolerant to trimethoprim-sulfamethoxazole (TMP-SMZ).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Candidiasis.

CNS: Headache; insomnia; dizziness; anxiety.

GI: Nausea; diarrhea; vomiting; abdominal pain; constipation; anorexia; dyspepsia.

RESP: Cough increased.

MISC: Fever; sweating; weakness; decreased sodium concentration; elevated amylase; allergic reaction; rhinitis; asthenia; infection; dyspnea.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If GI side effects occur, consider semisupine chair position.
- Anticipate oral candidiasis when HIV disease is reported.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Antibiotic prophylaxis should be considered when <500 PMN/mm³ are reported; elective dental treatment should be delayed until blood values improve above this level.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care since HIV infection reduces host resistance.

atropine (AT-troe-peen)

Sal-Tropine: Dental Tablets: 0.4 mg

AtroPen, Atropine-1, Atropine Sulfate, Atropine Sulfate Ophthalmic, Isopto Atropine

Atropine, Atropine Injection, Atropine Ointment, Minims Atropine

Drug Class: Anticholinergic; Antispasmodic

PHARMACOLOGY

Action

Inhibits action of acetylcholine or other cholinergic stimuli at postganglionic cholinergic receptors, including smooth muscles, secretory glands, and CNS sites.

Uses

Antisialagogue.

Contraindications

Hypersensitivity to anticholinergics; narrow-angle glaucoma; primary glaucoma or tendency toward glaucoma (ophthalmic); adhesions between iris and lens; prostatic hypertrophy; obstructive uropathy; myocardial ischemia; unstable cardiac status caused by hemorrhage; tachycardia; myasthenia gravis; pyloric or intestinal obstruction; asthma; hyperthyroidism; renal disease; hepatic disease; toxic megacolon; intestinal atony; or paralytic ileus.

Usual Dosage

Reduced oral secretions

ADULTS: 0.4 to 0.6 mg (usually single-dose use by DDS).
CHILDREN: *PO:* Use lowest effective dose.
7 to 16 lb: 0.1 mg
17 to 24 lb: 0.15 mg
24 to 40 lb: 0.2 mg
40 to 65 lb: 0.3 mg
65 to 90 lb: 0.4 mg
Over 90 lb: 0.4 mg

Pharmacokinetics

ABSORP: Rapidly absorbed after oral administration.
DIST: Readily crosses blood-brain barrier.
EXCRET: The $t_{1/2}$ is 3 hr (IV); 94% of dose is eliminated through urine in 24 hr.

DRUG INTERACTIONS

Sympathomimetic amines: Tachyarrhythmia (autonomic imbalance)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, excessive thirst; tongue chewing.
CVS: Altered ST-T waves; systole; atrial arrhythmia; atrial ectopic beats; atrial fibrillation; bigeminal beats; bradycardia; cardiac dilation; cardiac syncope; decreased BP; flattening of T wave; increased BP; intermittent nodal rhythm (no P wave); labile BP; left ventricular failure; MI; nodal extrasystole; palpitations; prolongation of sinus node recovery time; prolonged P wave; prolonged QT interval; retrograde conduction; R on T phenomenon; shortened PR segment; shortened RT duration; supraventricular extrasystole; tachycardia (sinus, supraventricular, junctional); transient AV dissociation; trigeminal beats; ventricular arrhythmia; ventricular extrasystole; ventricular fibrillation; ventricular flutter; ventricular premature contractions; weak or impalpable pulses; widening and flattening of QRS complex.
CNS: Abnormal movements; agitation; amnesia; anxiety; ataxia; Babinski reflex/Chaddock reflex; behavioral changes; coma; confusion; delirium; depression; difficulty concentrating; diminished tendon reflex; dizziness; dysarthria; dysmetria; fatigue; hallucinations; headache; hyperreflexia; hypertonia; insomnia; lethargy; locomotor difficulties; loss of libido; mania; mental disorder; muscle clonus; muscle twitching; opisthotonos; paranoia; restlessness; seizures; sensation of intoxication; somnolence; stupor; tremor; vertigo; weakness; withdrawal behavior.
GI: Abdominal distention; abdominal pain; constipation; decreased bowel sounds; decreased food absorption; delayed gastric emptying; distended abdomen; dysphagia; nausea; paralytic ileus; vomiting.

RESP: Breathing difficulty; inspiratory stridor; labored respirations; laryngospasm; pulmonary edema; respiratory failure; shallow respiration; slow respiration; subcostal recession; syncope; tachypnea.
MISC: Chest pain; feeling hot; heat intolerance; hyperpyrexia.

CLINICAL IMPLICATIONS

General

When prescribed by DDS:

- *Lactation:* Excreted in breast milk.
- *Special risk:* Use with caution in the elderly, in patients with Down syndrome, brain damage, spastic paralysis, disorders of heart rhythm (e.g., atrial flutter), severe narrow angle glaucoma, pyloric stenosis, prostatic hypertrophy, significant renal failure, or who have suffered a recent MI.
- *Anticholinergic psychosis:* Has occurred in sensitive patients.
- *Overdosage:* Dry mouth, thirst, vomiting, nausea, abdominal distention, CNS stimulation, delirium, drowsiness, restlessness, stupor, fever, seizures, hallucinations, convulsions, coma, circulatory failure, tachycardia, weak pulse, hypertension, hypotension, respiratory depression, palpitations, urinary urgency, blurred vision, dilated pupils, photophobia, rash, dry and hot skin.
- Dim room lights or provide sunglasses if patient experiences photophobia.

Pregnancy Risk Category: Category C.

Oral Health Education

- *When prescribed by DDS:* Explain name, dose, action, and potential side effects of drug.

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auranofin (or-RAIN-oh-fin)

Ridaura

Drug Class: Analgesic; Antirheumatic, Gold compound

PHARMACOLOGY

Action

Gold compounds relieve symptoms of arthritis but do not cure this disease; decreases rheumatoid factor concentrations and immunoglobulins.

Uses

Relief of symptoms of active adult rheumatoid arthritis poorly controlled with other therapies.

Unlabeled Uses

Treatment of pemphigus and psoriatic arthritis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

Reactions can occur months after therapy is discontinued.
⚠ **ORAL:** Stomatitis (13%).
CNS: Confusion; hallucinations; seizures.
GI: Diarrhea; abdominal pain; anorexia; dyspepsia; flatulence; GI bleeding; enterocolitis; gastritis; colitis; tracheitis.
RESP: Interstitial pneumonitis; pulmonary fibrosis.
MISC: Vaginitis; glossitis; leukopenia, thrombocytopenia (1%).

CLINICAL IMPLICATIONS

General

- *Arthritis:* Consider patient comfort and need for semisupine chair position.
- If GI side effects occur, consider semisupine chair position.

- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Be aware that patient may be taking COX inhibitors and other analgesics.

Oral Health Education

- Review oral hygiene, including use of soft toothbrush; daily flossing; and avoidance of strong, commercial mouthwashes. If mild stomatitis develops, an isotonic NaCl and sodium bicarbonate solution may be used.

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azathioprine (AZE-uh-THIGH-oh-preen)

Azasan, Imuran

Apo-Azathioprine, Gen-Azathioprine, ratio-Azathioprine

Azatrilem, Imuran

Drug Class: Immunosuppressive

PHARMACOLOGY

Action

Suppresses cell-mediated hypersensitivities; alters antibody production and may reduce inflammation.

Uses

Adjunct for prevention of rejection in renal homotransplantation; treatment in adults for severe, active, erosive rheumatoid arthritis not responsive to conventional management.

Unlabeled Uses

Treatment of chronic ulcerative colitis, Crohn disease, myasthenia gravis, and Behçet syndrome.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

GI: Nausea; vomiting (>10%).
CNS: Fever, chills (>10%).
MISC: Serious infections; neoplasias; thrombocytopenia, leukopenia, anemia (>10%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Serious infections are a potential complication of chronic immunosuppression; oral infection should be treated aggressively with antibiotic therapy.
- Medical consultation for CBC, including platelet count, should be completed.
- Blood dyscrasias are reported; anticipate increased bleeding, infection, and poor healing.
- This drug may be used with corticosteroids for additive effect.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.

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azelastine HCl (ah-ZELL-ass-teen HIGH-droe-KLOR-ide)

Astelin, Optivar

Drug Class: Antihistamine, H1

PHARMACOLOGY

Action

Competitively antagonizes histamine at H_1 receptor sites.

Uses

Treatment of symptoms of seasonal allergic rhinitis, such as rhinorrhea, sneezing, and nasal pruritus; treatment of symptoms of vasomotor rhinitis, such as rhinorrhea, nasal congestion, and postnasal drip (nasal inhalation); treatment of ocular itching associated with allergic conjunctivitis (ophthalmic).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Bitter taste, dry mouth (3%); aphthous stomatitis, taste loss (<2%).

CNS: Headache (15%); somnolence (12%); fatigue, dizziness (2%); hyperkinesias, hypoesthesia, vertigo, anxiety, depersonalization, depression, nervousness, sleep disturbances, abnormal thinking (<2%); confusion.
OPHTHALMIC: Headache (15%); fatigue (1% to 10%).

CVS: Flushing, hypertension, tachycardia (<2%).

GI: Nausea (3%); constipation, gastroenteritis, ulcerative stomatitis, vomiting, abdominal pain (<2%); diarrhea.

RESP: Cough (11%); asthma (5%); bronchospasm (<2%); dyspnea (postmarketing).
OPHTHALMIC: Asthma, dyspnea (1% to 10%).

MISC: Dysesthesia (8%); myalgia, cold symptoms, temporomandibular dislocation, allergic reaction, back pain, herpes simplex, viral infection, pain in extremities, malaise (<2%); anaphylactoid reaction, chest pain, facial edema, involuntary muscle contractions, paresthesia, tolerance.
OPHTHALMIC: Influenza-like symptoms (1% to 10%).

CLINICAL IMPLICATIONS

General

- Consider semisupine chair position to control effects of postnasal drainage.
- Be aware that patients with multiple allergies are at increased risk for allergy to dental drugs.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function. Uncontrolled disease characterized by wheezing, coughing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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azithromycin (UHZ-ith-row-MY-sin)

Zithromax: Tablets: 250, 500, 600 mg (as dihydrate); Powder for injection, lyophilized: 500 mg; Powder for oral suspension: 100 mg per 5 mL, 200 mg per 5 mL, 1 g/packet (as dihydrate)
Zmax: Tablets, extended release: 2 g

Z-Pak

Azitrocin

Drug Class: Antibiotic, macrolide

PHARMACOLOGY

Action

Interferes with microbial protein synthesis.

Uses

ADULTS: Treatment of infections of the respiratory tract, acute bacterial sinusitis, acute bacterial exacerbations of COPD, community-acquired pneumonia, *Mycobacterium avium* complex, pelvic inflammatory disease, pharyngitis/tonsillitis, skin and skin structure infections, and sexually transmitted diseases caused by susceptible organisms; extended release form single dose treatment for mild to moderate acute bacterial sinusitis or community-acquired pneumonia.

CHILDREN: Treatment of acute bacterial sinusitis, acute otitis media caused by susceptible organisms, community-acquired pneumonia, pharyngitis/tonsillitis caused by *Streptococcus pyogenes* in patients who cannot use first-line therapy.

Contraindications

Hypersensitivity to azithromycin, erythromycin, or to any macrolide antibiotic.

Usual Dosage

Bacterial infections

ADULTS: *PO:* 500 mg as single dose on first day, then 250 mg/day on days 2 through 5.

Pharmacokinetics

ABSORP: *Oral:* Rapidly absorbed. *IV:* C_{max} is approximately 3.63 mcg/mL; C_{min} is approximately 0.2 mcg/mL (at 24 hr), AUC_{24} is approximately 9.6 mcg hr/mL.

DIST: Widely distributed into body (skin, lung, sputum, cervix, tonsils) but distributes poorly in the cerebrospinal fluid. Higher concentrations in tissues than in plasma or serum. V_d is 31.1 L/kg (oral) and 33.3 L/kg (IV). Protein binding is 7% to 50% (concentration dependent).

EXCRET: The $t_{1/2}$ is approximately 68 hr. Plasma Cl is 630 mL/min (oral) and 10.18 mL/min/kg (IV). Excreted primarily in bile, predominantly as unchanged drug. Approximately 6% is excreted in urine as unchanged drug (oral); approximately 11% is excreted in the urine after first dose and 14% after fifth dose (IV).

DRUG INTERACTIONS

Digitoxin: Possible digitoxin toxicity (mechanism unknown)
- Avoid concurrent use.

Nelfinavir: Possible increased azithromycin toxicity (inhibition of P-glycoprotein)
- Avoid concurrent use.

Theophylline: Possible theophylline toxicity (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Oral candidiasis; tongue discoloration.

CVS: Palpitations; chest pain; arrhythmias; hypotension; QT prolongation; torsades de pointes.

CNS: Dizziness; headache; vertigo; somnolence; fatigue; agitation; aggressive behavior; anxiety; asthenia; convulsions; hyperactivity; malaise; nervousness; paresthesia; syncope.

GI: Diarrhea; nausea; vomiting; abdominal pain; dyspepsia; flatulence; melena; anorexia; constipation; pseudomembranous colitis; pancreatitis.

MISC: Angioedema; anaphylaxis; edema.

CLINICAL IMPLICATIONS

General

When prescribed by DDS:
- *Lactation:* Undetermined.
- *Hypersensitivity:* Serious reactions, including anaphylaxis, have occurred.
- *Renal failure:* Use cautiously.

- *Hepatic failure:* Use cautiously.
- *Cardiac effects:* Serious CV events have occurred with other macrolide antibiotics, including prolonged cardiac repolarization and QT interval.
- *Pneumonia:* Only effective for mild community-acquired pneumonia.
- *Pseudomembranous colitis:* May be factor in patients who develop diarrhea.
- *Superinfection:* Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms.
- Ensure patient knows how to take the drug, how long it should be taken, and to report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset) immediately.
- Antibiotic-associated diarrhea can occur. Have patient contact DDS immediately if signs develop.

When prescribed by medical facility:

- Determine why drug is being taken. If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- If GI side effects occur, consider semisupine chair position.

Pregnancy Risk Category: Category B.

Oral Health Education

When prescribed by DDS:

- Explain name, dose, action, and potential side effects of drug.
- Review dosing schedule and prescribed length of therapy with patient. Advise patient that dose, dosing frequency, and duration of therapy are dependent on site and cause of infection.
- Instruct patient using tablet form to take prescribed dose with a full glass of water.
- Instruct patient or caregiver using oral suspension to shake suspension well and then measure and administer prescribed dose using dosing spoon, dosing syringe, or medicine cup.
- Advise patient to take prescribed dose without regard to meals but to take with food if stomach upset occurs.
- Advise patient to take 2 hr before or after antacids containing aluminum or magnesium.
- Instruct patient to complete entire course of therapy, even if symptoms of infection have disappeared.
- Advise patient to discontinue therapy and contact health care provider immediately if skin rash, hives, itching, or shortness of breath occurs.
- Advise women to notify health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Advise patient to report signs of superinfection to health care provider: black "furry" tongue, white patches in mouth, foul-smelling stools, or vaginal itching or discharge.
- Warn patient that diarrhea containing blood or pus may be a sign of a serious disorder and to seek medical care if noted and not treat at home.
- Caution patient not to take any prescription or OTC medications, herbal preparations, or dietary supplements unless advised by health care provider.
- Advise patient that follow-up examinations and lab tests may be required to monitor therapy and to keep appointments.

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beclomethasone dipropionate (BEK-low-METH-uh-zone die-PRO-pee-oh-NATE)

QVAR, Vanceril, Beconase, Vancenase Pockethaler

Apo-Beclomethasone, Gen-Beclo Aq., Nu-Beclomethasone, Rivanase AQ

Aerobec, Beconase Aqua, Becotide

Drug Class: Corticosteroid

PHARMACOLOGY

Action

Has potent anti-inflammatory effect on respiratory tract and in nasal passages.

Uses

ORAL/NASAL INHALATION: Maintenance prophylactic treatment of asthma in patients 5 yr and older; asthma patients requiring systemic corticosteroid administration in which adding an inhaled corticosteroid may reduce or eliminate need for systemic corticosteroids.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Aspirin: Decreased aspirin effect (mechanism unknown)
- Avoid concurrent use.

Metronidazole: Decreased metronidazole effect (increased metabolism)
- Avoid concurrent use.

COX-1 inhibitors: Increased risk of peptic ulcer disease (additive)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; facial and tongue edema.

CNS: Headache; lightheadedness; agitation; depression; mental disturbances.
QVAR: Headache (≥3%).

GI: Dyspepsia; nausea; vomiting.
QVAR: Nausea (≥3%).

RESP: Coughing; wheezing; pulmonary infiltrates.
QVAR: Upper respiratory tract infections (≥3%); coughing (1% to 3%).

MISC: Hypersensitivity reaction with rash, urticaria, angioedema, and bronchospasm; pruritus; wheezing; dyspnea; acneiform lesions; atrophy; bruising; localized *Candida* or *Aspergillus* infections; cushingoid features; growth velocity reduction in children; weight gain.
QVAR: Increased asthma symptoms, oral symptoms (inhalation route), pain, back pain, dysphonia (≥3%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Acute bronchoconstriction can occur during dental treatment, have bronchodilator inhaler available.
- Ensure that bronchodilator inhaler is present at each dental appointment.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Inhalants can dry oral mucosa; anticipate candidiasis, increased calculus and plaque levels, and increased caries.
- Because of the anticipated perioperative physiological stress in patients undergoing dental care (minor surgical stress) under local anesthesia, such patients should take only their usual daily glucocorticoid dose before dental intervention. No supplementation is justified.

Oral Health Education

- Rinse mouth with water after bronchodilator use to prevent dryness.

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benazepril HCl (BEN-AZE-uh-prill HIGH-droe-KLOR-ide)

Lotensin

Drug Class: ACE inhibitor; Antihypertensive

PHARMACOLOGY

Action

Competitively inhibits angiotensin I–converting enzyme, resulting in the prevention of angiotensin I conversion to angiotensin II, a potent vasoconstrictor that stimulates aldoste-

rone secretion. Results in decrease in sodium and fluid retention, decrease in BP, and increase in diuresis.

Uses
Treatment of hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

ADVERSE EFFECTS
CNS: Headache (6%); dizziness (4%); fatigue (3%), somnolence.

CVS: Postural dizziness (2%); hypotension.

GI: Nausea (1%).

RESP: Chronic dry cough (1%).

MISC: Anaphylactoid reactions; angioedema.

CLINICAL IMPLICATIONS
General
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictors with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- If coughing is problematic, consider semisupine chair position for treatment.
- Susceptible patient with DM may experience severe recurrent hypoglycemia.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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benzocaine (BEN-zoe-kane)

Benzocaine: Cream: Benzocaine 5%
Hurricaine: Gel: Benzocaine 20%; Spray: Benzocaine 20%
Orajel Mouth-Aid: Liquid: Benzocaine 20%; Gel: Benzocaine 20%
Solarcaine Medicated First-Aid Spray: Spray: Benzocaine 20% with 0.13% triclosan, alcohol

Drug Class: Local anesthetic, topical

PHARMACOLOGY
Action
Blocks the influx of sodium ions into axons preventing depolarization.

Uses
For local anesthesia of accessible mucous membranes, including oral, nasal, and laryngeal mucous membranes, and respiratory or urinary tracts. Also for the treatment of pruritus ani, pruritus vulvae, and hemorrhoids.
For topical anesthesia in local skin disorders, including pruritus and pain due to minor burns, skin manifestations of systemic disease (e.g., chickenpox), prickly heat, abrasions, sunburn, plant poisoning, insect bites, eczema.

Contraindications
Hypersensitivity to any component of these products; ophthalmic use.

Usual Dosage
Topical anesthesia in the oral health care setting

Gel, 20%

Adults and Children older than 2 yr: Dosage varies depending on the area to be anesthetized and the vascularity of the area; do not use in children for more than 2 days.
Children younger than 2 yr: Do not administer to children younger than 2 yr of age.

Pharmacokinetics
PEAK: Less than 5 min.
DURATION: 15 to 45 min.

DRUG INTERACTIONS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Numbness, tingling.
MISC: Urethritis with and without bleeding. In a few case reports, methemoglobinemia characterized by cyanosis has followed topical application of benzocaine.

CLINICAL IMPLICATIONS
General
- Use the lowest dose effective for anesthesia to avoid high plasma levels and serious adverse effects.
- Benzocaine should not be used in those rare patients with congenital or idiopathic methemoglobinemia and in infants younger than 12 mo of age who are receiving treatment with methemoglobin-inducing agents. Very young patients or patients with glucose-6–phosphate deficiencies are more susceptible to methemoglobinemia.
- Do not use benzocaine in infants younger than 2 yr of age.
- *Lactation:* Exercise caution when administering during lactation.
- Use cautiously in patients with known drug sensitivities or in patients with severely traumatized mucosa and sepsis in the region of the application. If irritation or rash occurs, discontinue treatment and institute appropriate therapy.
- Topical anesthetics may impair swallowing and enhance danger of aspiration. Do not ingest food for 1 hr after anesthetic use in mouth or throat. This is particularly important in children because of their frequency of eating.
- Do not use for topical anesthesia if medical history reveals allergy to procaine, p-aminobenzoic acid (PABA), parabens, or other ester-type local anesthetics.
- Avoid applying to large areas of mucosa to prevent excessive systemic absorption and potential toxicity.

Pregnancy Risk Category: Category C.

Oral Health Education
- Do not ingest food for 1 hr following use of oral topical anesthetic preparations in the mouth or throat. Topical anesthesia may impair swallowing, thus enhancing the danger of aspiration.
- Numbness of the tongue or buccal mucosa may increase the danger of biting trauma. Do not eat or chew gum while the mouth or throat area is anesthetized.

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benztropine mesylate (BENZ-troe-peen MEH-sih-LATE)
Cogentin

Apo-Benztropine, Benztropine Omega

Drug Class: Anticholinergic

PHARMACOLOGY

Action

Thought to act by competitively antagonizing acetylcholine receptors in corpus striatum to restore neuromuscular balance.

Uses

Treatment of all forms of parkinsonism; control of extrapyramidal disorders (except tardive dyskinesia) caused by neuroleptic drugs.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CVS: Tachycardia; bradycardia.

CNS: Toxic psychosis including confusion, disorientation, memory impairment, visual hallucinations; exacerbation of preexisting psychosis; nervousness; depression; finger numbness.

GI: Paralytic ileus; constipation; nausea; vomiting.

MISC: Heat stroke; hyperthermia; fever; weakness; inability to move particular muscle groups; photophobia.

CLINICAL IMPLICATIONS

General

- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- Monitor vital signs.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Consider semisupine chair position if GI effects are problematic.
- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.

Oral Health Education

- Determine need for power toothbrush for self-care.
- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.

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betamethasone (BAY-tuh-METH-uh-zone)

(augmented betamethasone dipropionate, betamethasone dipropionate, betamethasone valerate, betamethasone sodium phosphate, betamethasone acetate)

Valisone: Ointment: 0.1%; Lotion: 0.1%; Cream: 0.1%
Beta-Val, Celestone, Celestone Phosphate, Celestone Soluspan, Diprolene, Diprolene AF, Diprosone, Luxiq, Maxivate, Teladar

Betnesol, Valisone Scalp Lotion, Betacort, Celestoderm-V, Celestoderm-V/2, Prevex B, Betaprolene, Diprolene Glycol, Taro-Sone, Topilene, ratio-Topilene, ratio-Topisone

Drug Class: Adrenal corticosteroid; Glucocorticoid

PHARMACOLOGY

Action

Synthetic, long-acting glucocorticoid that depresses formation, release, and activity of endogenous mediators of inflammation, including prostaglandins, kinins, histamine, liposomal enzymes, and complement system. Also modifies body's immune response.

Uses
TOPICAL: Relief of inflammatory and pruritic manifestations of corticosteroid-responsive mucocutaneous conditions and dermatoses.

Contraindications
TOPICAL: Do not use as monotherapy in primary bacterial infections.

Usual Dosage
TOPICAL (BETAMETHASONE DIPROPIONATE, BETAMETHASONE VALERATE)
Apply sparingly to affected areas 2 to 4 times/day.

DRUG INTERACTIONS
No documented drug-drug interactions significant to dental treatment. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** TOPICAL: Ulcerative esophagitis; thinning of mucosa.

CLINICAL IMPLICATIONS

General
When prescribed by DDS:
- *Topical:* Apply sparingly with cotton tip applicator.
- *Infections:* May mask signs of infection. May decrease host-defense mechanisms.
- *Ocular effects:* Use cautiously in ocular herpes simplex because of possible corneal perforation.
- *Sulfites:* Some products contain sulfites, which may cause allergic-type reactions in susceptible individuals.

Pregnancy Risk Category: Safety not established (systemic). Category C (topical).

Oral Health Education
When prescribed by DDS:
- Ensure patient understands how to use product, amount to apply, method of application, and signs of adverse effects.

Topical
- Demonstrate proper technique for cleaning affected area before applying medication and for applying sparingly as a thin film.
- Tell patient to avoid contact with eyes and to avoid tight-fitting clothing on treated area.
- Explain that preparations that contain alcohol should not be applied to affected area because of drying/irritation.
- Caution patient to discontinue medication and notify health care provider if affected area worsens or develops irritation, redness, burning, swelling, or stinging.

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betaxolol HCl (BAY-TAX-oh-lahl HIGH-droe-KLOR-ide)

Betoptic, Betoptic S, Kerlone

Drug Class: $Beta_1$-adrenergic blocker

PHARMACOLOGY

Action
Blocks $beta_1$ receptors, primarily affecting cardiovascular system (decreases heart rate, cardiac contractility, and BP) and lungs (promotes bronchospasm). Ophthalmic use reduces intraocular pressure, probably by reducing aqueous production.

Uses
Hypertension.
OPHTHALMIC PREPARATION: Lowering intraocular pressure; ocular hypertension; chronic open-angle glaucoma.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased antihypertensive effect (prostaglandin synthesis inhibition)
- Monitor blood pressure.

Sympathomimetic amines: Decreased antihypertensive effect (pharmacological antagonism)
- Use local anesthetic agents containing a vasoconstrictor with caution.

ADVERSE EFFECTS

CNS: Insomnia; fatigue; dizziness; depression; lethargy; drowsiness; forgetfulness; headache.
CVS: Bradycardia; postural hypotension (rare).
GI: Nausea; vomiting; diarrhea; constipation.
RESP: Bronchospasm; dyspnea; wheezing.
MISC: Weight changes; fever; facial swelling; muscle weakness; leukopenia, thrombocytopenia (rare). Ophthalmic betaxolol may produce the same adverse drug reactions seen with systemic use; antinuclear antibodies may develop.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Beta blockers may mask epinephrine-induced signs and symptoms of hypoglycemia in patients with diabetes.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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bethanechol chloride (beth-AN-ih-kole KLOR-ide)

Duvoid, Myotonachol, Urecholine

PMS-Bethanechol

Drug Class: Cholinergic stimulant; Urinary tract product

PHARMACOLOGY

Action

Stimulates parasympathetic nervous system, increasing tone to muscles of urinary bladder; stimulates gastric motility and tone and may restore rhythmic peristalsis.

Uses

Treatment of acute postoperative and postpartum nonobstructive urinary retention and neurogenic atony of the urinary bladder with retention.

Unlabeled Uses

Diagnosis and treatment of reflux esophagitis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Increased salivation.
CNS: Headache; malaise.
CVS: Orthostatic hypotension (high doses).
GI: Abdominal cramps or discomfort; colicky pain; nausea; belching; diarrhea; rumbling and gurgling of stomach.
RESP: Bronchial constriction; asthmatic attacks.

CLINICAL IMPLICATIONS

General

- If GI side effects occur, consider semisupine chair position.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

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biperiden (by-PURR-ih-den)

Akineton

Drug Class: Antiparkinson; Anticholinergic

PHARMACOLOGY

Action

Biperiden is a weak peripheral anticholinergic agent and possesses nicotinolytic activity.

Uses

Treatment of all forms of parkinsonism; control of extrapyramidal disorders secondary to neuroleptic drug therapy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Drowsiness; euphoria; disorientation; agitation; memory loss; disturbed behavior.

CVS: Orthostatic hypotension.

GI: Constipation; GI irritation.

MISC: Hyperthermia; heat stroke; photophobia.

CLINICAL IMPLICATIONS

General

- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- Anticholinergics have strong xerostomic effects. Anticipate increased caries activity and candidiasis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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bismuth subsalicylate (BISS-muth sub-suh-LIS-ih-late)

Bismatrol, Bismatrol Extra Strength, Pepto-Bismol, Pepto-Bismol Maximum Strength, Pink Bismuth

Pink Bismuth

Drug Class: Antidiarrheal

PHARMACOLOGY

Action

Produces antisecretory and antimicrobial effects; may have anti-inflammatory effect.

Uses
Treatment of indigestion without causing constipation, nausea, abdominal cramps; control of diarrhea, including traveler's diarrhea.

Unlabeled Uses
Treatment of recurrent ulcers, chronic infantile diarrhea, gastroenteritis associated with Norwalk virus; prevention of traveler's diarrhea.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Tetracyclines: Decreased tetracycline effect (decreased absorption)
- Avoid concurrent use.

ADVERSE EFFECTS
⚠ **ORAL:** Chalky taste; gray discoloration of tongue.
GI: Discoloration of stools; impaction.

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.

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bisoprolol fumarate (bis-OH-proe-lol)
Zebeta, Ziac (with hydrochlorothiazide)
Drug Class: Selective beta$_1$-adrenergic blocking agent

PHARMACOLOGY
Action
Blocks beta$_1$-adrenergic receptors to lower BP without reflex tachycardia or significant reduction in heart rate, and with high doses, blocks beta$_1$-adrenergic receptors in bronchial and vascular smooth muscle.

Uses
Antihypertensive, beta blocker.

Unlabeled Uses
Stable angina pectoris, stable CHF.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

Sympathomimetic amines: Decreased antihypertensive effect (pharmacological antagonism)
- Monitor blood pressure.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth; taste distortion; stomatitis.
CNS: Dizziness; vertigo; fatigue; change in behavior; altered consciousness; disorientation; ataxia.
CVS: Bradycardia; ventricular arrhythmias; postural hypotension; angina; presyncope; syncope; tachycardia; palpitation.
GI: GI pain; nausea; flatulence; indigestion.
RESP: Bronchospasm; dyspnea; cough.
MISC: Dry eyes; visual disturbance; arthralgia; myalgia.

CLINICAL IMPLICATIONS
General
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP ≥180/110 or in presence of other high-risk CV conditions.

- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- If GI side effects occur, consider semisupine chair position.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Beta blockers may mask epinephrine-induced signs and symptoms of hypoglycemia in patient with diabetes.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Direct dental light out of patient's eyes and offer dark glasses for comfort.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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bromocriptine mesylate (BROE-moe-KRIP-teen MEH-sih-LATE)

Parlodel

Apo-Bromocriptine, Parlodel, PMS-Bromocriptine

Cryocriptina, Parlodel, Serocryptin

Drug Class: Antiparkinson

PHARMACOLOGY

Action

Stimulates dopamine receptors in the corpus striatum, relieving parkinsonian symptoms. Inhibits prolactin, which is responsible for lactation; lowers elevated blood levels of growth hormone in acromegaly.

Uses

Treatment of hyperprolactinemia-associated disorders (e.g., amenorrhea with or without galactorrhea, infertility, hypogonadism) in patients with prolactin-secreting adenomas; therapy for female infertility associated with hyperprolactinemia; treatment of acromegaly; therapy for Parkinson disease (idiopathic or postencephalitic).

Unlabeled Uses

Treatment of hyperprolactinemia associated with pituitary adenomas; therapy for neuroleptic malignant syndrome; treatment of cocaine addiction.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Sympathomimetic amines: Cardiac arrhythmias (mechanism unknown)

- Use local anesthetic agents containing a vasoconstrictor with caution.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (high doses).

CNS: Headache; dizziness; fatigue; lightheadedness; fainting; drowsiness; psychosis; seizures; abnormal involuntary movements; hallucinations; confusion; dyskinesia, ataxia; insomnia; depression; vertigo; "on-off" phenomenon.

CVS: Orthostatic hypotension.

GI: Nausea; vomiting; abdominal cramps; constipation; diarrhea; anorexia; indigestion/dyspepsia; GI bleeding.

RESP: Shortness of breath; pulmonary infiltrates; pleural effusion; pleural thickening.

MISC: Exacerbation of Raynaud syndrome; asthenia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.

- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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brompheniramine (brome-fen-AIR-uh-meen)

Bidhist, BroveX, BroveX CT, Lodrane 24, Lodrane XR, LoHist 12, VaZol

Drug Class: Antihistamine

PHARMACOLOGY

Action

Competitively antagonizes histamine at H_1 receptor sites.

Uses

Relief of sneezing, itchy, watery eyes, itchy nose or throat, and runny nose because of hay fever (allergic rhinitis) or other respiratory allergies. VaZol is also indicated for temporary relief of runny nose and sneezing caused by the common cold; treatment of allergic and nonallergic pruritic symptoms; temporary relief of mild, uncomplicated urticaria and angioedema; amelioration of allergic reactions to blood or plasma loss; adjunctive therapy of anaphylactic reactions.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, nose and throat.

CVS: Hypotension; palpitations; tachycardia; extrasystoles.

CNS: Drowsiness; headache; sedation; sleepiness; dizziness; disturbed coordination; fatigue; confusion; restlessness; excitation; nervousness; tremor; irritability; insomnia; euphoria; paresthesia; vertigo; hysteria; neuritis; convulsions.

GI: Epigastric distress; anorexia; nausea; vomiting; diarrhea; constipation.

RESP: Thickening of bronchial secretions; tightness of chest and wheezing.

MISC: Anaphylactic shock; photosensitivity; excessive perspiration; chills.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Additional photosensitization is possible if tetracyclines are prescribed by DDS.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Consider semisupine chair position to control effects of postnasal drainage.
- Be aware that patients with multiple allergies are at increased risk for allergy to dental drugs.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

budesonide (byoo-DESS-oh-nide)

Entocort EC, Pulmicort Respules, Pulmicort Flexhaler, Rhinocort Aqua

Entocort Capsules, Entocort Enema, Gen-Budesonide AQ, Pulmicort Nebuamp, Rhinocort Turbuhaler

Drug Class: Corticosteroid

PHARMACOLOGY

Action

Exhibits wide range of inhibitory activities against multiple cell types and mediators involved in allergic-mediated inflammation.

Uses

INTRANASAL: Management of seasonal and perennial allergic rhinitis symptoms in adults and children (Rhinocort Aqua).

ORAL INHALATION: For the maintenance treatment of asthma as prophylactic therapy in adults and children and for patients requiring oral corticosteroid therapy for asthma (inhaler).

INHALATION SUSPENSION: Maintenance treatment of asthma and prophylactic therapy in children 12 mo to 8 yr of age.

ORAL CAPSULE: Crohn disease.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole or itraconazole: Possible budesonide toxicity (decreased metabolism)
- Avoid concurrent use.

Metronidazole: Decreased metronidazole effect (increased metabolism)
- Avoid concurrent use.

COX-1 inhibitors: Increased risk of peptic ulcer disease (additive)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** ORAL INHALATION: Dry mouth; tongue edema; tooth disorder (unspecified). ORAL CAPSULE: Impaired wound healing; oral candidiasis.

CNS: ORAL CAPSULE: Headache; dizziness; fatigue; hyperkinesis; paresthesia; tremor; agitation; increased appetite; confusion; insomnia; nervousness; sleep disorder; somnolence.

GI: ORAL CAPSULE: Indigestion; nausea; dyspepsia; abdominal pain; flatulence; vomiting; enteritis; epigastric pain; intestinal obstruction.

RESP: ORAL INHALATION: Increased cough; respiratory tract infection; bronchitis; dyspnea.

MISC: ORAL CAPSULE: Symptoms of hypercorticism; back pain; pain; asthenia; chest pain; dependent edema; face edema; flu-like symptoms; malaise; aggravated arthritis; cramps; myalgia; moniliasis; flushing.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Ensure that bronchodilator inhaler is present at each dental appointment.
- Be aware that sulfites in a local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Inhalants can dry oral mucosa; anticipate candidiasis, increased calculus and plaque levels, and increased caries.
- Because of the anticipated perioperative physiological stress, patients undergoing dental care (i.e., minor surgical stress) under local anesthesia should take only their usual daily glucocorticoid dose before dental intervention. No supplementation is justified.

Oral Health Education

- Rinse mouth with water after bronchodilator use to prevent dryness.

budesonide/formoterol fumarate dihydrate (bue-DES-oh-nide/fore-MOE-ter-ol fue-MAR-rate dye-HYE-drate)

Symbicort 80/4.5, Symbicort 160/4.5

Drug Class: Respiratory inhalant combination

PHARMACOLOGY

Uses

Long-term maintenance treatment of asthma.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Benzodiazepines: Possible decreased midazolam effect (increased metabolism)

- Monitor patient responses.

ADVERSE EFFECTS

⚠ **ORAL:** Oral candidiasis (3%).

CVS: Palpitations (less than 3%).

CNS: Headache (11%); dizziness, migraine, tension headache, tremor (less than 3%); behavioral disturbances, psychiatric symptoms including aggressive reactions, psychosis (postmarketing).

GI: Stomach discomfort (7%); vomiting (3%); diarrhea, dyspepsia, nausea, viral gastroenteritis (less than 3%).

RESP: Upper respiratory tract infection (11%); sinusitis (6%); bronchitis, cough, viral upper respiratory tract infection (less than 4%); acute bronchitis, asthma, lower respiratory tract infection (less than 3%); bronchospasm (postmarketing).

MISC: Influenza (3%); dysphonia, postprocedural pain, pyrexia, upper abdominal pain (less than 3%); immediate hypersensitivity including anaphylactic reactions, symptoms of hypocorticism, and hypercorticism (postmarketing).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Asthmatic patients often use a combination of inhalational drugs and orally administered drugs. Inhalation propellants may dry oral tissues when used chronically.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Inhalants can dry oral mucosa; anticipate candidiasis, increased calculus and plaque levels, and increased caries activity.
- Monitor vital signs (e.g., BP, pulse rate, respiratory rate and function); uncontrolled disease characterized by wheezing and coughing.
- The anticipated perioperative physiological stress in patients undergoing dental care (minor surgical stress) under local anesthesia is low. Client should take only the usual daily glucocorticoid dose before dental intervention. No supplementation is justified.

Oral Health Education

- Advise patient to rinse mouth with water after bronchodilator use to prevent dryness.
- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.

bumetanide (BYOO-MET-uh-nide)

Bumex

Burinex

Bumedyl, Drenural, Miccil

Drug Class: Loop diuretic

PHARMACOLOGY

Action

Inhibits reabsorption of sodium and chloride in proximal tubules and loop of Henle.

Uses

Treatment of edema associated with CHF, cirrhosis, and renal disease.

Unlabeled Uses

Relief of adult nocturia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased antihypertensive effect (inhibition of prostaglandin synthesis)

- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; increased thirst.

CNS: Asterixis; encephalopathy with preexisting liver disease; vertigo; headache; dizziness.

CVS: Postural hypotension; irregular heartbeat (hypokalemia).

GI: Upset stomach; nausea; vomiting; diarrhea; pain.

RESP: Hyperventilation.

MISC: Musculoskeletal weakness; arthritic pain; pain; muscle cramps; fatigue; dehydration; sweating.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Monitor pulse rhythm to assess for electrolyte imbalance.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

bupivacaine (byoo-PIH-vah-cane)

Bupivacaine HCl: Injection: bupivacaine 0.25%, 0.5%, 0.75%
Bupivacaine HCl with Epinephrine 1:200,000: Injection: bupivacaine 0.25%, 0.5%, 0.75% with 1:200,000 epinephrine
Bupivacaine Spinal: Injection: bupivacaine 0.75% in 8/25% dextrose
Marcaine: Injection: bupivacaine 0.25%, 0.5%, 0.75%, bupivacaine 0.25%, 0.5%, 0.75% with 1:200,000 epinephrine
Sensorcaine: Injection: bupivacaine 0.25%, 0.5%, 0.75%, bupivacaine 0.25%, 0.5% with 1:200,000 epinephrine
Sensorcaine MPF: Injection: bupivacaine 0.25%, 0.5%, 0.75%, bupivacaine 0.25%, 0.5% with 1:200,000 epinephrine
Sensorcaine-MPF Spinal: Injection: bupivacaine 0.75% in 8/25% dextrose

Buvacaina

Drug Class: Injectable local anesthetic, amide

PHARMACOLOGY

Action

Inhibits ion fluxes across membranes to block nerve action potential.

Uses

Local infiltration and sympathetic block: 0.25% solution.
Lumbar epidural: 0.25%, 0.5%, and 0.75% solutions (0.75% nonobstetrical).
Subarachnoid block: 0.75% solution in 8.25% dextrose.
Caudal block: 0.25% and 0.5% solutions.
Peripheral nerve block: 0.25% and 0.5% solutions.
Retrobulbar block: 0.75% solution.
Dental block and epidural test dose: 0.5% solution with epinephrine.

Contraindications

Hypersensitivity to local anesthetics or any components of the products, para-aminobenzoic acid (esters only) or parabens; spinal and caudal anesthesia in septicemia; existing neurological disease; spinal deformities; and severe hypertension, hemorrhage, shock, or heart block. Obstetrical paracervical block anesthesia (such use has resulted in fetal bradycardia and death); IV regional anesthesia (Bier block; cardiac arrest and death have occurred).

Usual Dosage

Intraoperative local anesthesia for dental procedures

Injection, 0.5% with epinephrine 1:200,000

Adults: For infiltration and block injection in the maxillary and mandibular areas when a longer duration of local anesthetic action is desired, such as for oral surgical procedures generally associated with significant postoperative pain, an average dose of 1.8 mL (9 mg) per injection site usually will suffice; an occasional second dose of 1.8 mL (9 mg) may be used if necessary to produce adequate anesthesia after making allowance for a 2- to 10-min onset time. The total dose for all injection sites spread out over a single dental sitting usually should not exceed 90 mg for a healthy adult patient (ten 1.8-mL injections). Inject slowly and with frequent aspirations.
Children: Because of lack of clinical experience, the administration of bupivacaine to children younger than 12 yr of age and bupivacaine 0.75% in dextrose to children younger than 18 yr of age is not recommended.

Pharmacokinetics

METAB: Liver.
EXCRET: Kidney (metabolites).

ONSET: 5 min.
DURATION: 2 to 4 hr.
SPECIAL POP: *Elderly:* Repeated doses may cause accumulation of the drug or its metabolites or slow metabolic degradation; give reduced doses.
Hepatic failure: Because amide-type local anesthetics are metabolized primarily in the liver and ester-type local anesthetics are hydrolyzed by plasma cholinesterase produced by the liver, patients with hepatic disease, especially severe hepatic disease, may be more susceptible to potential toxicity. Use cautiously in such patients.

DRUG INTERACTIONS

Intercurrent use: Mixtures of local anesthetics are sometimes employed to compensate for the slower onset of one drug and the shorter duration of action of the second drug. Toxicity is probably additive with mixtures of local anesthetics, but some experiments suggest synergisms. Exercise caution regarding toxic equivalence when mixtures of local anesthetics are employed. Some preparations contain vasoconstrictors. Keep this in mind when using concurrently with other drugs that may interact with vasoconstrictors
Sedatives: If employed to reduce patient apprehension during dental procedures, use reduced doses, since local anesthetics used in combination with CNS depressants may have additive effects. Give young children minimal doses of each agent.
Captopril: Possible increased risk of hypotension and bradycardia (mechanism unknown)
- Monitor clinical status.

Itraconazole: Possible bupivacaine toxicity (decreased metabolism)
- Monitor clinical status.

Cimetidine and ranitidine: Possible bupivacaine toxicity (decreased metabolism)
- Monitor clinical status.

Lidocaine: Possible lidocaine toxicity (displacement from binding site)
- Avoid concurrent use.

Mepivacaine: Possible mepivacaine toxicity (displacement from binding site)
- Avoid concurrent use.

Narcotics, morphine-like: Possible respiratory depression (mechanism unknown)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Trismus; tingling.
CNS: Convulsions, loss of consciousness (overdose).
CVS: Myocardial depression; cardiac arrest; dysrhythmias; bradycardia.
RESP: Status asthmaticus, respiratory arrest, anaphylaxis (allergy).
MISC: Discoloration at injection site; tissue necrosis.

CLINICAL IMPLICATIONS

General

- *Lactation:* Safety for use during lactation has not been established. Bupivacaine has been reported to be excreted in breast milk. However, it is not known whether local anesthetic drugs are excreted in breast milk.
- Use the lowest dosage that results in effective anesthesia to avoid high plasma levels and serious adverse effects. Inject slowly, with frequent aspirations before and during the injection, to avoid intravascular injection. Perform syringe aspirations before and during each supplemental injection in continuous (intermittent) catheter techniques. During the administration of epidural anesthesia, it is recommended that a test dose be administered initially and that the patient be monitored for CNS toxicity and cardiovascular toxicity, as well as for signs of unintended intrathecal administration, before proceeding.
- *Inflammation or sepsis:* Use local anesthetic procedures with caution when there is inflammation or sepsis in the region of proposed injection.
- *CNS toxicity:* Monitor cardiovascular and respiratory vital signs and state of consciousness after each injection. Restlessness, anxiety, incoherent speech, lightheadedness, numbness, and tingling of the mouth and lips, metallic taste, tinnitus, dizziness, blurred vision, tremors, twitching, depression, or drowsiness may be early signs of CNS toxicity.

- *Malignant hyperthermia:* Many drugs used during anesthesia are considered potential triggering agents for familial malignant hyperthermia. It is not known whether local anesthetics may trigger this reaction and the need for supplemental general anesthesia cannot be predicted in advance; therefore, have a standard protocol for management available.
- *Vasoconstrictors:* Use solutions containing a vasoconstrictor with caution and in carefully circumscribed quantities in areas of the body supplied by end arteries or having otherwise compromised blood supply (e.g., digits, nose, external ear, penis). Use with extreme caution in patients whose medical history and physical evaluation suggest the existence of hypertension, peripheral vascular disease, arteriosclerotic heart disease, cerebral vascular insufficiency, or heart block; these individuals may exhibit exaggerated vasoconstrictor response. Serious dose-related cardiac arrhythmias may occur if preparations containing a vasoconstrictor such as epinephrine are employed in patients during or following the administration of potent inhalation agents.

Pregnancy Risk Category: Category C.

Oral Health Education

- Advise the patient to exert caution to avoid inadvertent trauma to the lips, tongue, cheek, mucosae, or soft palate when these structures are anesthetized. The ingestion of food should therefore be postponed until normal function returns.
- Advise the patient to consult the dentist if anesthesia persists or a rash develops.

buprenorphine HCl (BYOO-preh-NAHR-feen HIGH-droe-KLOR-ide)

Buprenex, Subutex

Temgesic

Drug Class: Narcotic agonist-antagonist analgesic

DEA Schedule: Schedule III

PHARMACOLOGY

Action

Analgesic effect caused by binding to opiate receptors in the CNS. Antagonist effects decrease abuse potential.

Uses

TABLET: Treatment of opioid dependence.
INJECTION: Relief of moderate to severe pain.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Benzodiazepines: Increased CNS depression (additive)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.
CNS: Sedation; dizziness/vertigo; headache; confusion; dreaming; psychosis; euphoria; weakness/fatigue; malaise; hallucinations; depersonalization; coma; tremor; dysphoria; agitation; convulsions; lack of muscle coordination; insomnia.
GI: Nausea; vomiting; constipation; dyspepsia; flatulence; loss of appetite; diarrhea; abdominal pain.
RESP: Hypoventilation.
MISC: Chronic and acute hypersensitivity; infection.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If oral pain requires additional analgesics, consider nonopioid products.
- Chronic dry mouth is possible; anticipate candidiasis.

Oral Health Education
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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buprenorphine HCl/naloxone HCl (BYOO-preh-NAHR-feen HIGH-droe-KLOR-ide/NAL-ox-ohn HIGH-droe-KLOR-ide)

Synonym: naloxone HCl/buprenorphine HCl

Suboxone

Drug Class: Narcotic agonist-antagonist analgesic

PHARMACOLOGY

Action
BUPRENORPHINE: Analgesic effect caused by binding to opiate receptors in the CNS, while antagonist effects decrease abuse potential.
NALOXONE: Possibly antagonizes opioid effects by competing for the same receptor sites.

Uses
Treatment of opioid dependence.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Benzodiazepines: Increased CNS depression (additive)
- Avoid concurrent use.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth (<1%).
CNS: Headache; insomnia; anxiety; depression; dizziness; nervousness; somnolence.
CVS: Hypotension (1% to 5%).
GI: Abdominal pain; constipation; diarrhea; nausea; vomiting; dyspepsia.
RESP: Increased cough.
MISC: Pain; back pain; withdrawal symptoms; abscess; asthenia; chills; fever; flu-like syndrome; infection; accidental injury.

CLINICAL IMPLICATIONS

General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Avoid prescribing opioids for dental pain. Acetaminophen is appropriate if GI bleeding is present.
- Monitor vital signs.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Be aware that substance abusers are at increased risk for blood-borne diseases.

Oral Health Education
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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bupropion HCl (byoo-PRO-pee-ahn HIGH-droe-KLOR-ide)

Budeprion SR, Budeprion XL, Wellbutrin, Wellbutrin SR, Wellbutrin XL, Zyban

Drug Class: Antidepressant; Smoking deterrent

PHARMACOLOGY

Action
Exact mechanism of antidepressant activity or as a smoking deterrent unknown; does not inhibit MAOs.

Uses
Treatment of depression; aid to smoking cessation treatment.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Corticosteroids: Increased risk of seizures with systemic corticosteroids (additive)
- Monitor clinical status.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth (24%); taste perversion (4%).
CNS: Headache (26%); insomnia (16%); dizziness (11%); agitation (9%); confusion (8%); anxiety, tremor, hostility (6%); nervousness (5%); impaired sleep quality, sensory disturbances (4%); somnolence, irritability, decreased memory, decreased libido (3%); paresthesia, CNS stimulation (2%).
GI: Nausea (18%); constipation (10%); diarrhea (7%); anorexia (5%); increased appetite, dyspepsia, gustatory disturbance (3%); dysphagia (2%); vomiting.
RESP: Sinusitis (3%); increased cough (2%).
MISC: Infection, abdominal pain (9%); asthenia, chest pain (4%); fever (2%).

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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buspirone HCl (byoo-SPY-rone HIGH-droe-KLOR-ide)
BuSpar

Apo-Buspirone, Gen-Buspirone, Lin-Buspirone, Novo-Buspirone, Nu-Buspirone, PMS-Buspirone, ratio-Buspirone

Neurosine

Drug Class: Antianxiety

PHARMACOLOGY
Action
Mechanism unknown; does not exert anticonvulsant or muscle relaxant effects.

Uses
Treatment of anxiety disorders; short-term relief of anxiety symptoms.

Unlabeled Uses
Reduction of symptoms of premenstrual syndrome.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Itraconazole: Possible buspirone toxicity (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth.
CNS: Dizziness (12%); drowsiness (10%); headache (6%); nervousness (5%); lightheadedness (3%); excitement, numbness, anger/hostility, confusion, weakness (2%); paresthesia,

incoordination, tremor (1%); dream disturbances (≥1%); cogwheel rigidity; dizziness; dystonic reactions; ataxia; extrapyramidal effects; dyskinesias (acute and tardive); emotional lability; serotonin syndrome; difficulty in recall.

GI: Nausea (8%); diarrhea (2%).

MISC: Allergic reactions (including urticaria); angioedema.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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calcitonin-salmon (kal-sih-TOE-nin-SAM-un)

Calcimar, Fortical, Miacalcin, Osteocalcin, Salmonine

Caltine, Miacalcin NS

Miacalcic, Oseum, Tonocalcin

Drug Class: Hormone

PHARMACOLOGY

Action

Decreases rate of bone turnover, presumably by regulating bone metabolism (blocking bone resorption). In conjunction with parathyroid hormone, endogenous calcitonin regulates serum calcium.

Uses

Treatment of moderate to severe Paget disease, postmenopausal osteoporosis, hypercalcemia. Nasal spray for treatment of symptomatic Paget disease.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Salty taste, dry mouth.

GI: Nausea with or without vomiting (decreases with continued administration); anorexia; diarrhea; epigastric discomfort; abdominal pain.

RESP: Rhinitis (12%); nasal bleeding (intranasal spray).

CVS: Hypertension; tachycardia.

MISC: Feverish sensation; back and joint pain.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Patient may be high-risk candidate for pathological fractures or jaw fractures during extractions.

- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs.

calcitriol (kal-si-TRYE-ole)

Calcijex, Calcitriol Injection, Rocaltrol

Tirocal

Drug Class: Fat-soluble vitamin D

PHARMACOLOGY

Action

Supply of vitamin D depends mainly on exposure to ultraviolet rays of the sun for conversion of 7-dehydrocholesterol in the skin to vitamin D_3 (cholecalciferol). Vitamin D_3 is activated in the liver and kidney before becoming fully active as a regulator of calcium and phosphorus metabolism at target tissues.

Uses

ORAL: Dialysis, predialysis, hypoparathyroidism.
IV: Dialysis.

Unlabeled Uses

Decreased severity of psoriatic lesions with an initial oral dose of 0.25 mcg bid and topically 0.1 to 0.5 mcg/g petrolatum.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; metallic taste.
GI: Nausea; vomiting; constipation.
CNS: Weakness; headache; somnolence.
CVS: Arrhythmia; hypertension.
MISC: Muscle pain; bone pain; photophobia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs.
- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

candesartan cilexetil (kan-deh-SAHR-tan sigh-LEX-eh-till)

Atacand

Drug Class: Angiotensin II antagonist; Antihypertensive

PHARMACOLOGY

Action

Antagonizes the angiotensin II effect (vasoconstriction and aldosterone secretion) by blocking the angiotensin II receptor (AT_1 receptor) in vascular smooth muscle and the adrenal gland, producing decreased BP.

Uses
Treatment of hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
CNS: Headache; dizziness; fatigue.

CVS: Tachycardia; palpitations.

GI: Nausea; abdominal pain; diarrhea; vomiting.

RESP: URI; bronchitis; cough.

MISC: Back pain; chest pain; edema; arthralgia; albuminuria.

CLINICAL IMPLICATIONS
General
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- If coughing is problematic, consider semisupine chair position for treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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capecitabine (cap-eh-SITE-ah-bean)
Xeloda

Drug Class: Antimetabolite; Pyrimidine

PHARMACOLOGY
Action
Capecitabine is an oral systemic prodrug that is enzymatically converted to 5-fluorouracil (5-FU). Healthy and tumor cells metabolize 5-FU to 5-fluoro-2-deoxyuridine monophosphate (FdUMP) and 5-fluorouridine triphosphate (FUTP). These metabolites cause cell injury by two different mechanisms. First, they inhibit the formation of thymidine triphosphate, which is essential for the synthesis of DNA. Second, nuclear transcriptional enzymes can mistakenly incorporate FUTP during the synthesis of RNA. This metabolic error can interfere with RNA processing and protein synthesis.

Uses
Treatment of resistant metastatic breast cancer used alone or in combination with docetaxel; treatment of colorectal cancer.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Metronidazole: Metronidazole toxicity (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS
⚠ **ORAL:** Taste disturbances (6%); oral discomfort (unspecified) (10%); stomatitis (25%); candidiasis.

CNS: Paresthesia (21%); peripheral sensory neuropathy, headache (10%); dizziness (8%); insomnia (7%); mood alteration, depression (5%).

CVS: Edema.

GI: Diarrhea (55%); nausea (43%); abdominal pain (35%); vomiting (27%); decreased appetite (26%); constipation (14%); GI motility disorder, upper GI inflammatory disorders, dyspepsia (8%); GI hemorrhage, ileus (6%).

RESP: Dyspnea (14%); cough (7%); epistaxis (3%).

MISC: Fatigue/weakness (42%); pyrexia (18%); edema (15%); pain (12%); back pain (10%); myalgia (9%); arthralgia (8%); chest pain, pain in limb (6%); viral infections (5%); anemia (72%); neutropenia (26%); lymphopenia (94%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Advise products for palliative relief of oral manifestations (e.g., stomatitis, mucositis, xerostomia).
- Consider medical consult to determine disease control and influence on dental treatment.
- Blood dyscrasias reported; anticipate increased bleeding, infection, and poor healing.
- Anticipate oral candidiasis and need for antifungal therapy.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care, recommending soft-bristle toothbrushes.

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capsaicin (kap-SAY-uh-sin)

Capsin, Capzasin P, Dolorac, No Pain-HP, Pain Doctor, Pain-X, R-Gel, Zostrix, Zostrix-HP

Antiphlogistine Rub A-535 Capsaicin, Capsaicin HP

Drug Class: Analgesic, topical

PHARMACOLOGY

Action

May deplete and prevent reaccumulation of substance P, principal transmitter of pain impulses, from periphery to CNS.

Uses

Temporary relief of pain from rheumatoid arthritis and osteoarthritis; relief of neuralgias (e.g., pain after shingles, diabetic neuropathy).

Unlabeled Uses

Temporary relief of pain of psoriasis, vitiligo, intractable pruritus, postmastectomy and postamputation neuroma (phantom limb syndrome), vulvar vestibulitis, apocrine chromidrosis, reflex sympathetic dystrophy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

RESP: Cough; respiratory irritation.

MISC: Local burning at application site.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.

captopril (KAP-toe-prill)

Capoten

APO-Capto, Gen-Captopril, Novo-Captoril, Nu-Capto, PMS-Captopril, ratio-Captopril

Capitral, Capotena, Captral, Cardipril, Cryopril, Ecapresan, Ecaten, Kenolan, Lenpryl, Precaptil, Romir

Drug Class: Antihypertensive; ACE inhibitor

PHARMACOLOGY

Action

Competitively inhibits angiotensin I–converting enzyme, preventing conversion of angiotensin I to angiotensin II, a potent vasoconstrictor that also stimulates aldosterone secretion. Results in decreased BP, potassium retention, and reduced sodium reabsorption.

Uses

Treatment of hypertension, CHF, left ventricular dysfunction after MI, diabetic nephropathy.

Unlabeled Uses

Treatment of hypertensive crisis, neonatal and childhood hypertension, rheumatoid arthritis, diagnosis of anatomic renal artery stenosis and primary aldosteronism, treatment of hypertension related to scleroderma renal crisis and Takayasu disease, idiopathic edema, Bartter and Raynaud syndromes, asymptomatic left ventricular dysfunction after MI.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Bupivacaine: Possible increased risk of hypotension and bradycardia (mechanism unknown)

- Avoid concurrent use.

COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)

- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Taste disturbance; aphthous ulcers; dry mouth; angioedema, oral infection associated with agranulocytosis (rare).

CNS: Headache; sleep disturbances; paresthesias; dizziness; fatigue; malaise; ataxia; confusion; depression; nervousness.

CVS: Hypotension; tachycardia; palpitation; orthostatic hypotension.

GI: Nausea; abdominal pain; vomiting; gastric irritation; peptic ulcer; jaundice; cholestasis; diarrhea; anorexia; constipation.

RESP: Chronic dry cough; dyspnea; eosinophilic pneumonitis.

MISC: Gynecomastia; myasthenia; photosensitivity; neutropenia, agranulocytosis (rare).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- If coughing is problematic, consider semisupine chair position for treatment.
- Susceptible patients with DM may experience severe recurrent hypoglycemia.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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carbamazepine (KAR-bam-AZE-uh-peen)

Carbatrol, Epitol, Tegretol, Tegretol XR

APO-Carbamazepine, Gen-Carbamazepine CR, Novo-Carbamaz, Nu-Carbamazepine, PMS-Carbamazepine CR, Taro-Carbamazepine

Carbazep, Carbazina, Clostedal, Neugeron

Drug Class: Anticonvulsant

PHARMACOLOGY

Action

Mechanism appears to act by reducing polysynaptic responses and blocks posttetanic potentiation.

Uses

Treatment of epilepsy (e.g., partial seizures with complex symptoms, generalized tonic-clonic seizures [grand mal], mixed seizure patterns, other partial or generalized seizures) in patients refractory to or intolerant of other agents. Treatment of pain associated with trigeminal neuralgia.

Unlabeled Uses

Treatment of certain psychiatric disorders; management of alcohol withdrawal; relief of restless legs syndrome; treatment of postherpetic neuralgia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole, ketoconazole, or itraconazole: Possible carbamazepine toxicity (decreased metabolism)
- Monitor clinical status.

Alprazolam or clonazepam: Decreased alprazolam or clonazepam effect (increased metabolism)
- Monitor clinical status.

Metronidazole: Possible carbamazepine toxicity (decreased metabolism)
- Monitor clinical status.

Tramadol: Decreased tramadol effect (increased metabolism)
- Monitor clinical status.

Doxycycline: Decreased doxycycline effect (increased metabolism)
- Avoid concurrent use.
  May decrease valproic acid levels; may alter carbamazepine levels.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; glossitis; stomatitis.

CNS: Dizziness; drowsiness; unsteadiness; confusion; headache; hyperacusis; fatigue; speech disturbances; abnormal involuntary movements; peripheral neuritis and paresthesias; depression with agitation; talkativeness; behavior changes (children); paralysis.

CVS: Hypertension or hypotension; arrhythmia; syncope; CHF.

GI: Nausea; vomiting; gastric distress; abdominal pain; diarrhea; constipation; anorexia.

RESP: Pulmonary hypersensitivity (e.g., fever, dyspnea, pneumonitis, pneumonia).

MISC: Aching joints and muscles; leg cramps; adenopathy; lymphadenopathy; fever; chills; syndrome of inappropriate antidiuretic hormone secretion.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine level of disease control, type and frequency of seizure, and compliance with medication regimen.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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carisoprodol (car-eye-so-PRO-dole)

Soma

Drug Class: Skeletal muscle relaxant, centrally acting

PHARMACOLOGY

Action

Produces skeletal muscle relaxation, probably as result of its sedative properties.

Uses

Adjunctive treatment of acute, painful musculoskeletal conditions (e.g., muscle strain).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Dizziness; drowsiness; vertigo; ataxia; tremor; agitation; irritability; headache; depressive reactions; syncope; insomnia.

CVS: Postural hypotension; tachycardia.

GI: Nausea; vomiting; hiccups; epigastric distress.

RESP: Asthma.

MISC: Allergic or idiosyncratic reactions within first to fourth doses, including skin rash, erythema multiforme, pruritus, eosinophilia, and fixed drug eruption; more severe reactions include fever, weakness, dizziness, angioneurotic edema, and anaphylactoid shock.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *For back pain:* Consider semisupine chair position for patient comfort.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.

carteolol HCl (CAR-tee-oh-lahl HIGH-droe-KLOR-ide)

Cartrol, Ocupress

Drug Class: Beta-adrenergic blocker

PHARMACOLOGY

Action

Blocks beta-receptors, primarily affecting cardiovascular system (e.g., decreases heart rate, cardiac contractility, BP) and lungs (promotes bronchospasm). Ophthalmic use reduces intraocular pressure, probably by decreasing aqueous production.

Uses

Management of hypertension. Ophthalmic preparation for control of intraocular hypertension and lowering of intraocular pressure in chronic open-angle glaucoma.

Unlabeled Uses

Treatment of angina.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

Sympathomimetic amines: Decreased antihypertensive effect (pharmacological antagonism)
- Use local anesthetic agents containing a vasoconstrictor with caution.
- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disturbance; oral ulceration (unspecified).

CNS: Insomnia; fatigue; dizziness; depression; lethargy; drowsiness; forgetfulness; headache.

CVS: Bradycardia; arrhythmia; palpitations; hypertension or hypotension orthostatic hypotension.

GI: Nausea; vomiting; diarrhea; constipation.

RESP: Bronchospasm; shortness of breath; wheezing.

MISC: Weight changes; fever; facial swelling; cramps; muscle weakness. Antinuclear antibodies may develop; blood dyscrasias (rare).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Beta blockers may mask epinephrine-induced signs and symptoms of hypoglycemia in patient with diabetes.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- If GI or respiratory side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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carvedilol (CAR-veh-DILL-ole)

Coreg

Dilatrend

Drug Class: Alpha-adrenergic blocker; Beta-adrenergic blocker

PHARMACOLOGY

Action

Blocks alpha$_1$-receptors and nonselective beta-receptors to decrease BP.

Uses

Management of essential hypertension; treatment of mild to severe heart failure of ischemic or cardiomyopathic origin. Reduce cardiovascular mortality in clinically stable patients who have survived the acute phase of MI and have a left ventricular ejection fraction of 40% or less.

Unlabeled Uses

Angina pectoris.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)

- Monitor blood pressure.

Sympathomimetic amines: Decreased antihypertensive effect with epinephrine (pharmacological antagonism)

- Monitor blood pressure. Use local anesthetic agents with vasoconstrictor with caution.

Hypertensive reactions with epinephrine (unopposed alpha-adrenergic stimulation)

- Monitor blood pressure. Use local anesthetic agents with vasoconstrictor with caution.

Decreased antianaphylactic effect of epinephrine (beta blockade)

- Increase epinephrine dosage may be required in anaphylaxis.

ADVERSE EFFECTS

⚠ **ORAL:** Periodontitis (1% to 3%); dry mouth.

CNS: Dizziness (32%); fatigue (24%); headache (8%); lung edema (for treatment of left ventricular dysfunction following MI [>3%]); somnolence, vertigo, hypesthesia, paresthesia, depression, insomnia (1% to 3%).

CVS: Bradycardia, postural hypotension, edema (2%).

GI: Diarrhea (12%); nausea (9%); vomiting (6%); melena, GI pain (1% to 3%).

RESP: Upper respiratory tract infection (18%); increased cough (8%); sinusitis, bronchitis (5%); rales (4%); dyspnea (for treatment of LVD following MI [>3%]).

MISC: Asthenia (11%); pain (9%); edema generalized, arthralgia (6%); edema dependent (4%); allergy, malaise, hypovolemia, fever, leg edema, infection, viral infection, back pain muscle cramps, arthritis, hypotonia, flu-like syndrome, peripheral vascular disorder (1% to 3%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or

in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Evaluate respiratory function.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Beta blockers may mask epinephrine-induced signs and symptoms of hypoglycemia in patients with diabetes.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI or respiratory side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.

Oral Health Education
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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cefaclor (SEFF-uh-klor)

Ceclor, Ceclor Pulvules

Apo-Cefaclor, Novo-Cefaclor, Nu-Cefaclor, PMS-Cefaclor

Drug Class: Antibiotic, cephalosporin

PHARMACOLOGY

Action
Inhibits mucopeptide synthesis in bacterial cell wall.

Uses
Treatment of infections of respiratory tract, urinary tract, skin and skin structures; treatment of otitis media caused by susceptible strains of specific microorganisms.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Tongue discoloration; candidiasis; thirst; glossitis; swollen tongue; taste disturbance.

GI: Nausea; vomiting; diarrhea; anorexia; abdominal pain or cramps; flatulence; colitis, including pseudomembranous colitis.

RESP: Asthma; bronchitis.

CNS: Dizziness; lethargy; confusion; nervousness.

CVS: Hypotension; palpitations; syncope.

MISC: Hypersensitivity, including Stevens-Johnson syndrome, erythema multiforme and toxic epidermal necrolysis; serum sickness–like reactions (e.g., skin rash, polyarthritis, arthralgia, fever); candidal overgrowth; various blood dyscrasias (rare).

CLINICAL IMPLICATIONS

General
- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.

- If prescribed by the DDS, ensure patient knows how to take the drug, how long it should be taken, and to immediately report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset). See Chapter 4: *Medical Management of Odontogenic Infections*.
- Antibiotic-associated diarrhea can occur. Have patient contact DDS immediately if signs develop.
- Oral candidiasis is possible; determine need for antifungal therapy.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective nontraumatic self-care.

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cefadroxil (SEFF-uh-DROX-ill)

Duricef: Capsules: 500 mg (as monohydrate); Tablets: 1 g (as monohydrate); Powder for Oral Suspension: 125, 250, 500 mg/5 mL

Apo-Cefadroxil, Novo-Cefadroxil

Cefamox, Duracef

Drug Class: Antibiotic, cephalosporin

PHARMACOLOGY

Action

Inhibits mucopeptide synthesis in bacterial cell wall.

Uses

Treatment of infections of urinary tract, skin, and skin structures; treatment of pharyngitis and tonsillitis caused by susceptible strains of specific microorganisms.

Contraindications

Hypersensitivity to cephalosporins.

Usual Dosage

ADULTS: *PO:* 1 to 2 g/day in single dose or 2 divided doses.
CHILDREN: *PO:* 30 mg/kg/day in single dose or 2 divided doses.

Pharmacokinetics

ABSORP: Rapidly absorbed. C_{max} is about 16 mcg/mL (500-mg dose) and 28 mcg/mL (1000-mg dose).

DIST: 20% protein bound.

EXCRET: More than 90% is excreted in the urine as unchanged drug within 24 hr; $t_{1/2}$ is 78 to 96 min.

SPECIAL POP: *Renal failure:* The $t_{1/2}$ is increased. Adjust dosage.

DRUG INTERACTIONS

No documented drug-drug interactions significant to dentistry. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Tongue discoloration; candidiasis; thirst; glossitis; swollen tongue; taste disturbance.

GI: Nausea; vomiting; diarrhea; anorexia; abdominal pain or cramps; flatulence; colitis, including pseudomembranous colitis.

RESP: Asthma; bronchitis.

CNS: Dizziness; lethargy; confusion; nervousness.

CVS: Hypotension; palpitation; syncope.

MISC: Hypersensitivity, including Stevens-Johnson syndrome, erythema multiforme and toxic epidermal necrolysis; serum sickness–like reactions (e.g., skin rash, polyarthritis, arthralgia, fever); candidal overgrowth; blood dyscrasias (rare).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.
- *When prescribed by the DDS:* Ensure patient knows how to take the drug, how long it should be taken, and to report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset) immediately. See Chapter 4: *Medical Management of Odontogenic Infections*.
- Antibiotic-associated diarrhea can occur. Have patient contact DDS immediately if signs develop.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- *Lactation:* Excreted in breast milk.
- *Children:* In infants, consider benefits relative to risks. Drug may accumulate in newborns.
- *Hypersensitivity:* Reactions range from mild to life-threatening. Administer drug with caution to penicillin-sensitive patients because of possible cross-reactivity.
- *Renal failure:* Use drug with caution in patients with renal impairment. Dosage adjustment based on renal function may be required.
- *Superinfection:* May result in bacterial or fungal overgrowth of nonsusceptible microorganisms.
- *Pseudomembranous colitis:* Consider in patients in whom diarrhea develops.
- *Overdosage:* Seizures.

Pregnancy Risk Category: Category B.

Oral Health Education

When prescribed by DDS:

- Instruct patient to complete full course of therapy.
- Instruct patient to check body temperature daily. If fever persists more than a few days or if high fever (~102°F) or shaking chills are noted, notify health care provider immediately.
- Advise patient to maintain normal fluid intake while using this medication.
- Advise diabetic patient to use enzyme-based tests (e.g., Clinistix, Testape) for monitoring urine glucose because drug may give false results with other test methods.
- Instruct patient to report the following symptoms to health care provider: nausea, vomiting, diarrhea, skin rash, hives, or muscle or joint pain.
- Instruct patient to report signs of superinfection: black "furry" tongue, white patches in mouth, foul-smelling stools, or vaginal itching or discharge.
- Warn patient that diarrhea that contains blood or pus may be a sign of serious disorders. Tell patient to seek medical care and not to treat at home. Instruct patient to seek emergency care immediately if wheezing or difficulty in breathing occurs.

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cefazolin sodium (seff-UH-zoe-lin SO-dee-uhm)

Zolicef: Powder for Injection: 500 mg (2.1 mEq sodium/g), 1 g (2.1 mEq sodium/g)

Cefamezin

Drug Class: Antibiotic, cephalosporin

PHARMACOLOGY

Action
Inhibits mucopeptide synthesis in bacterial cell wall.

Uses
Treatment of infections of respiratory tract, genitourinary tract, skin and skin structures, biliary tract, bones and joints; perioperative prophylaxis; treatment of septicemia and endocarditis caused by susceptible strains of specific microorganisms.

Contraindications
Hypersensitivity to cephalosporins.

Usual Dosage
Perioperative prophylaxis

ADULTS: *IV/IM:* 1 g 30 min to 1 hr prior to surgery; 0.5 to 1 g at appropriate intervals (at least 2-hr) during surgery; 0.5 to 1 g q 6 to 8 hr for 24 hr (up to 5 days) after surgery. CHILDREN OVER 1 MO: *IV/IM:* 25 to 50 mg/kg/day divided into 3 to 4 equal doses; (max, 100 mg/kg/day).

Pharmacokinetics
ABSORP: *IV:* C_{max} is about 185 mcg/mL.

DIST: 80% to 86% protein bound. Crosses the placenta. Very low concentrations are found in breast milk.

EXCRET: The $t_{1/2}$ is approximately 1.8 hr (IV) and approximately 2 hr (IM); 70% to 80% is excreted unchanged in the urine.

SPECIAL POP: *Renal failure:* The $t_{1/2}$ is increased. Dosage adjustment is needed.

DRUG INTERACTIONS
Methyldopa: Pustular eruption (mechanism unknown)
- Avoid concurrent use.

ADVERSE EFFECTS
GI: Nausea; vomiting; diarrhea; anorexia; abdominal pain or cramps; colitis, including pseudomembranous colitis.

MISC: Hypersensitivity, including Stevens-Johnson syndrome, erythema multiforme, toxic epidermal necrolysis; candidal overgrowth; serum sickness–like reactions (e.g., skin rash, polyarthritis, arthralgia, fever); phlebitis, thrombophlebitis, and pain at injection site.

CLINICAL IMPLICATIONS
General
- This drug is used in patients at risk for bacterial endocarditis who cannot swallow oral antibiotics. It would be administered by physician prior to a dental appointment during which significant bleeding is expected.

Pregnancy Risk Category: Category B.

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cefdinir (SEFF-dih-ner)
Omnicef

Drug Class: Antibiotic, cephalosporin

PHARMACOLOGY
Action
Inhibits mucopeptide synthesis in bacterial cell wall.

Uses
Treatment of community-acquired pneumonia, acute exacerbations of chronic bronchitis, acute maxillary sinusitis, pharyngitis, and tonsillitis, uncomplicated skin and skin structure

infections, and otitis media (pediatric patients only) caused by susceptible strains of specific microorganisms.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Tongue discoloration; candidiasis; thirst; glossitis; swollen tongue; taste disturbance.

CNS: Headache; dizziness; lethargy; confusion; nervousness.

CVS: Hypotension; palpitations; syncope.

GI: Diarrhea; nausea; vomiting; abdominal pain.

RESP: Asthma; bronchitis.

MISC: Elevated liver enzymes; proteinuria; RBCs in urine; eosinophilia; elevated urine pH.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- If prescribed by the DDS, ensure patient knows how to take the drug, how long it should be taken, and to report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset) immediately. See Chapter 4: *Medical Management of Odontogenic Infections*.
- Antibiotic-associated diarrhea can occur. Have patient contact DDS immediately if signs develop.
- Oral candidiasis is possible; determine need for antifungal therapy.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

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cefditoren pivoxil (SEFF-dih-TORE-ehn pih-VOX-ill)

Spectracef

Drug Class: Antibiotic, cephalosporin

PHARMACOLOGY

Action

Inhibits mucopeptide synthesis in bacterial cell wall.

Uses

Treatment of mild to moderate infections of acute bacterial exacerbation of chronic bronchitis, pharyngitis, tonsillitis, and uncomplicated skin and skin-structure infections caused by susceptible strains of specific microorganisms.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Thirst; glossitis; candidiasis.

CNS: Headache; reversible hyperactivity; seizures.

CVS: Hypotension; syncope; palpitation.

GI: Diarrhea; nausea; abdominal pain; dyspepsia; vomiting; pseudomembranous colitis; colitis.

RESP: Asthma; bronchitis; dyspnea.

MISC: Allergic reactions; anaphylaxis; drug fever; hypertonia; superinfection; serum sickness-like reaction; blood dyscrasias (leukopenia, thrombocytopenia, others), interference with vitamin K–dependent clotting factors.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- If prescribed by the DDS, ensure patient knows how to take the drug, how long it should be taken, and to report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset) immediately. See Chapter 4: *Medical Management of Odontogenic Infections*.
- Antibiotic-associated diarrhea can occur. Have patient contact DDS immediately if signs develop.
- Oral candidiasis is possible; determine need for antifungal therapy.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Monitor vital signs.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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cefixime (SEFF-IKS-eem)

Suprax

Denvar, Novacef

Drug Class: Antibiotic, cephalosporin

PHARMACOLOGY

Action

Inhibits mucopeptide synthesis in bacterial cell wall.

Uses

Treatment of uncomplicated UTIs, otitis media, pharyngitis, tonsillitis, acute bronchitis, acute exacerbations of chronic bronchitis, and uncomplicated gonorrhea caused by susceptible strains of specific organisms.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions significant to dentistry. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Tongue discoloration; candidiasis; thirst; glossitis; swollen tongue; taste disturbance.

CNS: Headaches, dizziness, seizures (<2%).

CVS: Hypotension; palpitations; syncope.

GI: Diarrhea (16%); nausea (7%); loose or frequent stools (6%); flatulence (4%); abdominal pain, dyspepsia (3%); vomiting (<2%).

RESP: Asthma; bronchitis.

MISC: Hypersensitivity, including Stevens-Johnson syndrome, erythema multiforme, and toxic epidermal necrolysis; serum sickness–like reactions (e.g., skin rash, polyarthritis, arthralgia, fever); candidal overgrowth; various blood dyscrasias (rare).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.

- If prescribed by the DDS, ensure patient knows how to take the drug, how long it should be taken, and to report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset) immediately. See Chapter 4: *Medical Management of Odontogenic Infections*.
- Antibiotic-associated diarrhea can occur. Have patient contact DDS immediately if signs develop.
- Oral candidiasis is possible; determine need for antifungal therapy.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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cefpodoxime proxetil (SEF-pode-OX-eem PROX-uh-til)

Vantin

Orelox

Drug Class: Antibiotic, cephalosporin

PHARMACOLOGY

Action

Inhibits mucopeptide synthesis in bacterial cell wall.

Uses

Treatment of infections of respiratory tract, urinary tract, skin, and skin structures; treatment of sexually transmitted diseases caused by susceptible strains of specific microorganisms.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Tongue discoloration; candidiasis; thirst; glossitis; swollen tongue; taste disturbance.

GI: Nausea; vomiting; diarrhea; anorexia; abdominal pain or cramps; flatulence; colitis, including pseudomembranous colitis.

RESP: Asthma; bronchitis.

CNS: Dizziness; lethargy; confusion; nervousness.

CVS: Hypotension; palpitations; syncope.

MISC: Hypersensitivity, including Stevens-Johnson syndrome, erythema multiforme, toxic epidermal necrolysis; serum sickness–like reactions (e.g., skin rashes, polyarthritis, arthralgia, fever); candidal overgrowth; various blood dyscrasias (rare).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- If prescribed by the DDS, ensure patient knows how to take the drug, how long it should be taken, and to report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset) immediately. See Chapter 4: *Medical Management of Odontogenic Infections*.
- Antibiotic-associated diarrhea can occur. Have patient contact DDS immediately if signs develop.
- Oral candidiasis is possible; determine need for antifungal therapy.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

cefprozil (SEFF-pro-zill)

Cefzil

Procef

Drug Class: Antibiotic, cephalosporin

PHARMACOLOGY

Action

Inhibits mucopeptide synthesis in bacterial cell wall.

Uses

Treatment of infections of skin and skin structures, bronchitis, pharyngitis, tonsillitis, and otitis media caused by susceptible strains of specific microorganisms.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Tongue discoloration; candidiasis; thirst; glossitis; swollen tongue; taste disturbance.

CNS: Headache; dizziness; fatigue; paresthesia; confusion; nervousness; sleeplessness; insomnia.

CVS: Hypotension; palpitation; syncope.

GI: Nausea; vomiting; diarrhea; abdominal pain or cramps; flatulence; colitis, including pseudomembranous colitis.

RESP: Asthma; bronchitis.

MISC: Hypersensitivity, including Stevens-Johnson syndrome, erythema multiforme, toxic epidermal necrolysis; candidal overgrowth; serum sickness–like reactions (e.g., skin rashes, polyarthritis, arthralgia, fever); various blood dyscrasias (rare).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- If prescribed by the DDS, ensure patient knows how to take the drug, how long it should be taken, and to report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset) immediately. See Chapter 4: *Medical Management of Odontogenic Infections*.
- Antibiotic-associated diarrhea can occur. Have patient contact DDS immediately if signs develop.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

ceftibuten (seff-TIE-byoo-ten)

Cedax

Drug Class: Antibiotic, cephalosporin

C

PHARMACOLOGY

Action

Inhibits mucopeptide synthesis in bacterial cell wall.

Uses

Treatment of pharyngitis/tonsillitis caused by *Streptococcus pyogenes*; otitis media caused by *Moraxella catarrhalis*, *Haemophilus influenzae* (including beta-lactamase-producing strains) or *S. pyogenes;* and acute bacterial exacerbation of chronic bronchitis caused by *S. pneumoniae* (penicillin-susceptible strains), *H. influenzae* (including betalactamase-producing strains), or *M. catarrhalis* (including beta-lactamase-producing strains).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Thirst; glossitis; candidiasis.
GI: Nausea; vomiting; diarrhea; anorexia; abdominal pain or cramps; flatulence; colitis.
RESP: Asthma; bronchitis; dyspnea.
CNS: Headache; reversible hyperactivity; seizures.
CVS: Hypotension; syncope; palpitation.
MISC: Hypersensitivity, including Stevens-Johnson syndrome, erythema multiforme, and toxic epidermal necrolysis; serum sickness–like reactions (e.g., skin rash, polyarthritis, arthralgia, fever); candidal overgrowth; blood dyscrasias (leukopenia, thrombocytopenia, others), interference with vitamin K–dependent clotting factors.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- If prescribed by the DDS, ensure patient knows how to take the drug, how long it should be taken, and to report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset) immediately. See Chapter 4: *Medical Management of Odontogenic Infections*.
- Antibiotic-associated diarrhea can occur. Have patient contact DDS immediately if signs develop.
- Oral candidiasis is possible; determine need for antifungal therapy.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Monitor vital signs.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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cefuroxime (SEFF-yur-OX-eem)

Zinacef

Apo-Cefuroxime

Cefuracet, Cetoxil, Froxal, Zinnat

Drug Class: Antibiotic, cephalosporin

PHARMACOLOGY

Action

Inhibits mucopeptide synthesis in bacterial cell wall.

Uses

ORAL FORM: Treatment of infections of lower respiratory tract, urinary tract, skin, and skin structures; treatment of uncomplicated gonorrhea, otitis media, pharyngitis, and tonsillitis

caused by susceptible strains of specific microorganisms. Treatment of early Lyme disease, pharyngitis/tonsillitis, and impetigo.

PARENTERAL FORM: Treatment of infections of lower respiratory tract, urinary tract, skin, and skin structures, bone and joint; preoperative prophylaxis; treatment of septicemia, gonorrhea, and meningitis caused by susceptible strains of specific microorganisms.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Tongue discoloration; candidiasis; thirst; glossitis; swollen tongue; taste disturbance.

GI: Nausea; vomiting; diarrhea; anorexia; abdominal pain or cramps; flatulence; colitis, including pseudomembranous colitis.

RESP: Asthma; bronchitis.

CNS: Dizziness, lethargy; confusion; nervousness.

CVS: Hypotension; palpitation; syncope.

MISC: Hypersensitivity, including Stevens-Johnson syndrome, erythema multiforme, toxic epidermal necrolysis; candidal overgrowth; serum sickness–like reactions (e.g., skin rashes, polyarthritis, arthralgia, fever); phlebitis, thrombophlebitis, and pain at injection site; various blood dyscrasias (rare).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- If prescribed by the DDS, ensure patient knows how to take the drug, how long it should be taken, and to report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset) immediately. See Chapter 4: *Medical Management of Odontogenic Infections*.
- Antibiotic-associated diarrhea can occur. Have patient contact DDS immediately if signs develop.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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celecoxib (sel-eh-cox-ib)

Celebrex

Drug Class: COX-2 inhibitor

PHARMACOLOGY

Action

Reduces inflammation (e.g., pain, redness, swelling, heat), fever, and pain by inhibiting chemicals in the body that cause inflammation, fever, and pain. This is probably caused by the inhibition of prostaglandin synthesis, primarily via inhibition of COX-2 isoenzyme.

Uses

Relief of symptoms of osteoarthritis; relief of symptoms of rheumatoid arthritis in adults; management of acute pain in adults; treatment of primary dysmenorrhea; reduction of the number of adenomatous colorectal polyps in familial adenomatous polyposis (FAP), as an adjunct to usual care (e.g., endoscopic surveillance, surgery).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole: Possible celecoxib toxicity (decreased metabolism)
- Avoid concurrent use.

COX-1 inhibitors: Increased incidence of peptic ulcer disease (additive)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Taste disturbance, herpes simplex, nonspecified tooth disorder, dry mouth, stomatitis (<2%).

CNS: Dizziness; insomnia; fatigue; migraine; anxiety; anorexia; increased appetite; depression; nervousness; somnolence.

CVS: Palpitation, tachycardia (<2%).

GI: Abdominal pain; diarrhea; dyspepsia; flatulence; constipation; diverticulitis; dysphagia; eructation; gastritis; gastroenteritis; gastroesophageal reflux; hemorrhoids; hiatal hernia; melena; tenesmus; vomiting.

RESP: Pharyngitis; URI; bronchitis; bronchospasm; aggravated bronchospasm; coughing; dyspnea; pneumonia.

MISC: Peripheral edema; accidental injury; allergic reaction; asthenia; chest pain; generalized edema; facial edema; fever; hot flushes; flu-like symptoms; pain; peripheral pain; leg cramps; hypertonia; hypesthesia; neuralgia; neuropathy; paresthesia; vertigo; arthralgia; arthrosis; bone disorder; accidental fracture; myalgia; neck stiffness; synovitis; tendinitis; anemia, ecchymosis, thrombocytopenia (<2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- Use COX inhibitors with caution; they may exacerbate PUD and GERD.
- *Arthritis:* Consider patient comfort and need for semisupine chair position.
- If GI or respiratory side effects occur, consider semisupine chair position.
- Blood dyscrasias reported; anticipate increased bleeding and poor healing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective, nontraumatic self-care.
- Evaluate manual dexterity; consider need for power toothbrush.

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cephalexin (seh-fuh-LEX-in)

Keflex: Capsules: 250, 500 mg; Powder for Oral Suspension: 125, 250 mg/5 mL

APO-Cephalex, Novo-Lexin, Nu-Cephalex

Ceporex, Naxifelar

Drug Class: Antibiotic, cephalosporin

PHARMACOLOGY

Action

Inhibits mucopeptide synthesis in bacterial cell wall.

Uses

Treatment of infections of respiratory tract, urinary tract, skin and skin structures, and bone; treatment of otitis media caused by susceptible strains of specific microorganisms.

Contraindications
Hypersensitivity to cephalosporins.

Usual Dosage
ADULTS: *PO*: 1 to 4 g/day in divided doses (max, 4 g/day).
CHILDREN: *PO*: (cephalexin monohydrate only) 25 to 100 mg/kg/day in divided doses.

Pharmacokinetics
ABSORP: Cephalexin is rapidly absorbed. C_{max} is about 9 to 32 mcg/mL (250-mg to 1-g doses). T_{max} is 1 hr.
DIST: Cephalexin is 10% protein bound.
EXCRET: More than 90% is excreted unchanged in the urine within 8 hr. The $t_{1/2}$ is 50 to 80 min.

DRUG INTERACTIONS
No documented drug-drug interactions significant to dentistry. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Tongue discoloration; candidiasis; thirst; glossitis; swollen tongue; taste disturbance.
GI: Nausea; vomiting; diarrhea; anorexia; abdominal pain or cramps; flatulence; colitis, including pseudomembranous colitis.
RESP: Asthma; bronchitis.
CNS: Dizziness; lethargy; confusion; nervousness.
CVS: Hypotension; palpitations; syncope.
MISC: Hypersensitivity, including Stevens-Johnson syndrome, erythema multiforme, toxic epidermal necrolysis; candidal overgrowth; serum sickness–like reactions (e.g., skin rash, polyarthritis, arthralgia, fever); blood dyscrasias (rare).

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- *When prescribed by DDS:* Ensure patient knows how to take the drug, how long it should be taken, and to report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset) immediately. See Chapter 4: *Medical Management of Odontogenic Infections*.
- This drug is used for antibiotic prophylaxis in patients at risk for joint infection who have had TJR, as an alternative to amoxicillin.
- *Lactation:* Excreted in breast milk.
- *Children:* Safety and efficacy of cephalexin HCl monohydrate (Keftab) in children not established.
- *Hypersensitivity:* Reactions range from mild to life threatening. Administer drug with caution to penicillin-sensitive patients because of possible cross-reactivity.
- Assess for signs and symptoms of anaphylaxis (e.g., shortness of breath, wheezing, laryngeal spasm). Have resuscitation equipment available.

Pregnancy Risk Category: Category B.

Oral Health Education
When prescribed by DDS:
- Instruct patient to complete full course of therapy.
- Instruct patient to seek emergency care immediately if wheezing or difficulty breathing occurs.

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cephradine (SEFF-ruh-deen)

Velosef: Capsules: 250, 500 mg; Powder for Oral Suspension: 125, 500 mg/5 mL
Drug Class: Antibiotic, cephalosporin

PHARMACOLOGY

Action

Inhibits mucopeptide synthesis in bacterial cell wall.

Uses

Treatment of infections of respiratory tract, urinary tract, skin, and skin structure; treatment of otitis media caused by susceptible strains of microorganisms.

Contraindications

Hypersensitivity to cephalosporins.

Usual Dosage

ADULTS: *PO:* 250 mg to 1 g q 6 to 12 hr.
CHILDREN: *PO*: 25 to 100 mg/kg/day in equally divided doses q 6 to 12 hr (max, 4 g/day).

Pharmacokinetics

ABSORP: Cephradine is rapidly absorbed. C_{max} is about 9 mcg/mL (250 mg) to 24.2 mcg/mL (1 g). T_{max} is 1 hr. Food delays absorption.
DIST: 8% to 17% protein bound.
EXCRET: More than 90% is excreted unchanged in the urine. The $t_{1/2}$ is 48 to 80 min.
SPECIAL POP: *Renal failure:* The $t_{1/2}$ is prolonged. Dosage adjustment is recommended.

DRUG INTERACTIONS

No documented drug-drug interactions significant to dentistry. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Tongue discoloration; candidiasis; thirst; glossitis; swollen tongue; taste disturbance.
GI: Nausea; vomiting; diarrhea; anorexia; abdominal pain or cramps; flatulence; colitis, including pseudomembranous colitis.
RESP: Asthma; bronchitis.
CNS: Dizziness; lethargy; confusion; nervousness.
CVS: Hypotension; palpitation; syncope.
MISC: Hypersensitivity, including Stevens-Johnson syndrome, erythema multiforme, toxic epidermal necrolysis; candidal overgrowth; serum sickness–like reactions (e.g., skin rash, polyarthritis, arthralgia, fever); various blood dyscrasias (rare).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- This drug may be prescribed by DDS for antibiotic prophylaxis when the patient is at risk for joint infection following TJR.
- *If prescribed by DDS:* Ensure patient knows how to take the drug, how long it should be taken, and to immediately report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset). See Chapter 4: *Medical Management of Odontogenic Infections*.
- *Lactation:* Excreted in breast milk.
- *Hypersensitivity:* Reactions range from mild to life-threatening. Administer drug with caution to penicillin-sensitive patients because of possible cross-reactivity.
- Assess for signs and symptoms of anaphylaxis (e.g., shortness of breath, wheezing, laryngeal spasm). Have resuscitation equipment available.

Pregnancy Risk Category: Category B.

Oral Health Education

When prescribed by DDS:

- Instruct patient to complete full course of therapy.
- Advise patient to take with food or milk if GI distress occurs.
- Advise patient to maintain normal fluid intake while using this medication.
- Remind patient with diabetes to use enzyme-based tests (e.g., Clinistix or Testape) for monitoring urine glucose because drug may give false results with other test types.
- Instruct patient to seek emergency care immediately if wheezing or difficulty in breathing occurs.

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cetirizine (seh-TEER-ih-zeen)

Zyrtec

Apo-Cetirizine, Reactine

Virlix

Drug Class: Antihistamine

PHARMACOLOGY

Action

Competitively antagonizes histamine at the H_1-receptor site.

Uses

Symptomatic relief of symptoms (e.g., nasal, nonnasal) associated with seasonal and perennial allergic rhinitis; treatment of uncomplicated skin manifestations of chronic idiopathic urticaria.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (5%); salivation, ulcerative stomatitis, caries, tongue discoloration, tongue edema, taste perversion, taste loss (<2%).

CNS: Somnolence, headache (14%); fatigue (6%); dizziness (2%); paresthesia, confusion, hyperkinesia, hypertonia, migraine, tremor, vertigo, ataxia, dystonia, abnormal coordination, hyperesthesia, hypoesthesia, myelitis, paralysis, twitching, insomnia, sleep disorder, nervousness, depression, emotional lability, impaired concentration, anxiety, depersonalization, paroniria, abnormal thinking, agitation, amnesia, decreased libido, euphoria, dysphonia, ptosis (<2%); convulsions; hallucinations; orofacial dyskinesia; suicidal ideation.

CVS: Postural hypotension; palpitation.

GI: Abdominal pain (6%); nausea, diarrhea, vomiting (3%); anorexia, increased appetite, dyspepsia, flatulence, constipation, gastritis, rectal hemorrhage, hemorrhoids, melena, eructation, enlarged abdomen, (<2%).

RESP: Coughing, epistaxis (4%); bronchospasm (3%); bronchitis, rhinitis, dyspnea, URI, hyperventilation, increased sputum, pneumonia, respiratory disorder (<2%).

MISC: Flushing, edema (e.g., facial, leg, peripheral, and generalized), lymphadenopathy, back pain, malaise, fever, asthenia, rigors, pain, chest pain, leg cramps, increased weight, pallor, hot flashes (<2%); anaphylaxis.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider semisupine chair position to control effects of postnasal drainage.
- Be aware that patients with multiple allergies are at increased risk for allergy to dental drugs.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

cetirizine HCl/pseudoephedrine HCl (seh-TIH-rih-zeen HIGH-droe-klor-ide SUE-doe-eh-FED-rin)

Synonym: pseudoephedrine HCl/cetirizine HCl

Zyrtec-D 12 Hour

Drug Class: Antihistamine; Adrenergic

PHARMACOLOGY

Action

Competitive antagonist for H1 receptors (cetirizine HCl); activates alpha-receptors to cause vasoconstriction and reduced secretions (pseudoephedrine).

Uses

Upper respiratory combination, decongestant, antihistamine.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Cetirizine: Dry mouth; nose, throat.
Pseudoephedrine: Dry mouth.
CNS: Cetirizine: Dizziness; drowsiness; fatigue.
Pseudoephedrine: Dizziness; tremor.
CVS: Pseudoephedrine: Arrhythmia, tachycardia, palpitations, transient hypertension.
GI: Cetirizine: Nausea.
MISC: Cetirizine: Photophobia.
Pseudoephedrine: Leukopenia; agranulocytosis; thrombocytopenia (rare hypersensitivity reaction).

CLINICAL IMPLICATIONS

General

- Consider semisupine chair position for patient comfort when respiratory symptoms occur.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.
- *Photophobia:* direct dental light out of patient's eyes and offer dark glasses for comfort.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

cetuximab (se-TUX-i-mab)

Erbitux

Drug Class: Antineoplastic; Monoclonal antibody

PHARMACOLOGY

Action

Competitively inhibits binding of epidermal growth factor (EGF) to receptors, which blocks phosphorylation and activation of receptor-associated kinases, resulting in inhibition of cell growth.

Uses

In combination with radiation therapy for the treatment of locally or regionally advanced squamous cell carcinoma of the head and neck; as single-agent treatment of recurrent or metastatic squamous cell carcinoma of the head and neck in patients in whom prior platinum-based therapy failed; in combination with irinotecan for the treatment of EGF receptor–expressing, metastatic colorectal carcinoma in patients who are refractory to irinotecan-based chemotherapy; as single-agent treatment of EGF receptor–expressing, metastatic colorectal carcinoma in patients who are intolerant to irinotecan-based chemotherapy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

Percentages for adverse reactions are for grades 1 to 4 toxicity with cetuximab monotherapy.

⚠ **ORAL:** Stomatitis (10%).

CNS: Asthenia/malaise (48%); asthenia (45%); headache (26%); insomnia (10%); depression (7%).

GI: Nausea (29%); abdominal pain, constipation (26%); diarrhea, vomiting (25%); anorexia (23%); dyspepsia (6%).

RESP: Dyspnea (17%); increased cough (11%); pulmonary embolus (1%).

MISC: Pain (28%); fever (27%); infusion reactions (21%; severe, 4%); infection (14%); nonneutralizing anti-cetuximab antibodies (5%); severe infusion reactions (4%); sepsis (3%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Malignancy*: Seek medical consultation to determine WBC and platelet count before invasive dental procedures, including periodontal debridement.
- Advise products for palliative relief of oral manifestations (stomatitis, mucositis, xerostomia, etc.)
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage patient to follow daily plaque control procedures for effective self-care.
- Recommend frequent maintenance prophylaxis when immunosuppression is evident.
- Teach patient importance of updating health and drug history if physician makes any changes in evaluation/drug regimens.

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cevimeline HCl (seh-vih-MEH-leen HIGH-droe-KLOR-ide)

Evoxac: Gelatin capsules: 30 mg

Drug Class: Cholinergic agonist

PHARMACOLOGY

Action

Cevimeline is a cholinergic agonist that binds to muscarinic receptors. Muscarinic agonists in sufficient dosage can increase secretion of exocrine glands, such as salivary and sweat glands, and increase tone of the smooth muscle in the GI and urinary tracts.

Uses

Relieves dry mouth in patients with Sjögren syndrome.

Contraindications

Patients with uncontrolled asthma, hypersensitivity to cevimeline, or any condition in which miosis could be harmful (e.g., acute iritis, narrow-angle glaucoma).

Usual Dosage

Dry mouth with Sjögren syndrome

ADULTS: *PO:* 30 mg tid.

Dosage adjustments

ADULTS: *PO:* Because cevimeline is eliminated extensively in the urine, dosage adjustments may be required for patients with severe renal failure. However, specific recommendations are not established.

Pharmacokinetics

ABSORP: Cevimeline is rapidly absorbed. T_{max} is 1.5 to 2 hr. Food decreases the rate of absorption and C_{max} (by 17.3%).

DIST: V_d is about 6 L/kg. Cevimeline is less than 20% protein bound. It is extensively bound to tissues.

METAB: Cevimeline is metabolized by CYP2D6 and CYP3A3/4.

EXCRET: After 24 hr, 84% is excreted in the urine (16% as unchanged drug). The $t_{1/2}$ is about 5 hr.

DRUG INTERACTIONS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Salivation.

CNS: Dizziness; fatigue.

CVS: Hot flushes.

GI: Nausea; vomiting; diarrhea; dyspepsia.

RESP: Sinusitis; URI; rhinitis; cough.

MISC: Drugs that inhibit CYP2D6 and CYP3A3/4 also inhibit the metabolism of cevimeline. Use with caution in patients known or suspected to be deficient of CYP2D6 activity.

CLINICAL IMPLICATIONS

General

When prescribed by DDS:

- *Lactation:* Undetermined.
- *Children:* Safety and efficacy not established.
- *Elderly:* Exercise special care when cevimeline treatment is initiated in an elderly patient, considering the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or other drug therapy in the elderly.
- *Biliary tract:* Administer with caution to patients with a history of nephrolithiasis.
- *CV:* Cevimeline can potentially alter cardiac conduction or heart rate. Use with caution in patients with a history of CV disease evidenced by angina pectoris or MI.
- *Ocular:* Ophthalmic formulations of muscarinic agonists have been reported to cause visual blurring that may result in decreased visual acuity (especially at night and in patients with central lens changes) and impairment of depth perception. Advise caution while driving at night or performing hazardous activities in reduced lighting.

- *Pulmonary:* Cevimeline can potentially increase airway resistance, bronchial smooth muscle tone, and bronchial secretions. Administer with caution to patients with asthma, chronic bronchitis, or COPD.
- *Renal colic:* Administer with caution to patients with a history of nephrolithiasis.
- *Overdosage:* Headache, visual disturbance, lacrimation, sweating, respiratory distress, GI spasm, nausea, vomiting, diarrhea, AV block, tachycardia, bradycardia, hypotension, hypertension, shock, mental confusion, cardiac arrhythmia, and tremors.

When prescribed by medical facility:

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If GI or respiratory side effects occur, consider semisupine chair position.

Pregnancy Risk Category: Category C.

Oral Health Education

When prescribed by DDS:

- Inform patient that cevimeline may cause visual disturbances, especially at night, which could impair their ability to drive safely.
- If a patient sweats excessively while taking cevimeline, consult health care provider and advise the patient to drink extra water as dehydration may develop.

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chloral hydrate (KLOR-uhl HIGH-drate)

Aquachloral Supprettes: Suppositories: 324, 648 mg

PMS-Chloral Hydrate

Drug Class: Sedative and hypnotic, nonbarbiturate

DEA Schedule: Schedule IV

PHARMACOLOGY

Action

Exact mechanism is unknown; can produce mild CNS depression.

Uses

Management of short-term insomnia; sedation; adjunctive to anesthesia, analgesia; prevention or suppression of alcohol withdrawal symptoms (rectal).

Unlabeled Uses

Conscious sedation in pediatric dentistry.

Contraindications

Hypersensitivity to chloral derivatives; severe renal or hepatic impairment; gastritis (oral forms); severe cardiac disease.

Usual Dosage

Premedication

ADULTS: *PO:* 500 mg to 1 g 30 min before procedure.

Dental sedation

CHILDREN: 75 mg/kg; supplementation with nitrous oxide may provide better sedation than manufacturer's recommended dosage.

Pharmacokinetics

ABSORP: Readily absorbed.

DIST: 35% to 41% protein bound (trichloroethanol). Excreted in breast milk.

METAB: Metabolized to trichloroethanol (active), which is then converted in liver and kidney to trichloroacetic acid (inactive).

EXCRET: The $t_{1/2}$ is 7 to 10 hr (trichloroethanol). Metabolites are excreted in urine and bile.

DRUG INTERACTIONS

Anticoagulants, oral: Increased anticoagulant effect (displacement from binding site)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Unpleasant taste.
CNS: Somnambulism; ataxia; dizziness; headache; "hangover" effect.
GI: Stomach pain; nausea; vomiting; diarrhea; flatulence.
RESP: Respiratory depression.
MISC: Hypersensitivity (e.g., rash, itching, erythema multiforme, fever).

CLINICAL IMPLICATIONS

General

When used by DDS:
- *Lactation:* Excreted in breast milk.
- *Tartrazine sensitivity:* Some products contain tartrazine, which can cause allergic-type reactions in some individuals.
- *Overdosage:* Stupor, coma, pinpoint pupils, hypotension, slow or rapid and shallow respirations, hypothermia, muscle flaccidity; also nausea, vomiting, gastritis, hemorrhagic gastritis, and gastric necrosis caused by drug's corrosive action.

Pregnancy Risk Category: Category C.

Oral Health Education

When used by DDS:
- Instruct patient to take medication exactly as prescribed. Warn that taking doses too close together could result in overdose. Omit missed doses.
- Advise patient that drug may cause drowsiness or dizziness and to use caution when driving or performing other tasks requiring mental alertness.
- Caution patient to avoid intake of alcoholic beverages and other CNS depressants such as barbiturates and narcotics.
- Instruct patient not to take OTC medications without consulting health care provider.

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chlordiazepoxide (klor-DIE-aze-ee-POX-ide)

Librium: Capsules: 5, 10, 25 mg; Powder for Injection: 100 mg

Apo-Chlordiazepoxide

Drug Class: Antianxiety, benzodiazepine

DEA Schedule: Schedule IV

PHARMACOLOGY

Action

Potentiates action of GABA to produce CNS depression.

Uses

Management of anxiety disorders; relief of acute alcohol withdrawal symptoms; relief of preoperative apprehension and anxiety.

Unlabeled Uses

Treatment of irritable bowel syndrome.

Contraindications

Hypersensitivity to benzodiazepines; psychoses; acute narrow-angle glaucoma; shock; coma.

Usual Dosage

Individualize dosage. Acute symptoms may be rapidly controlled IM or IV, with subsequent oral treatment (max, 300 mg/day).

CHILDREN OVER 6 YR: *PO:* 5 mg bid to qid; may be increased to 10 mg bid to tid.
CHILDREN OVER 12 YR: *IM:* 25 to 50 mg

Mild to Moderate Anxiety

ADULTS: *PO:* 5 to 10 mg tid or qid.

Severe Anxiety

ADULTS: *PO:* 20 to 25 mg tid or qid.
INITIAL DOSE: *IM/IV:* 50 to 100 mg, then 25 to 50 mg tid or qid.
ELDERLY OR DEBILITATED PATIENTS: *PO:* 5 mg bid to qid. *IM/IV:* 25 to 50 mg.

Preoperative Apprehension/Anxiety

ADULTS: *PO:* 5 to 10 mg tid or qid on days preceding surgery. *IM:* 50 to 100 mg 1 hr prior to surgery.

Pharmacokinetics

ABSORP: T_{max} is 0.5 to 4 hr.
DIST: 96% protein bound.
METAB: Metabolized in the liver to the major metabolite desmethylchlordiazepoxide and to several inactive intermediate metabolites.
EXCRET: The $t_{1/2}$ is 5 to 30 hr. Excreted in the urine, with 1% to 2% as unchanged drug and 3% to 6% as a conjugate.

DRUG INTERACTIONS

Ketoconazole: Possible chlordiazepoxide toxicity (decreased metabolism)
- Avoid concurrent use.

Cimetidine: Possible chlordiazepoxide toxicity (decreased metabolism)
- Avoid concurrent use.

Contraceptives, combination: Possible chlordiazepoxide toxicity (mechanism unknown)
- Avoid concurrent use.

Disulfiram: Possible chlordiazepoxide toxicity (decreased metabolism)
- Avoid concurrent use.

Levodopa: Decreased levodopa effect (mechanism unknown)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; coated tongue.
CVS: CV collapse; hypotension, orthostatic hypotension; hypertension; tachycardia; bradycardia; edema; phlebitis or thrombosis at IV sites.
CNS: Drowsiness; confusion; ataxia; dizziness; fatigue; apathy; memory impairment; disorientation; anterograde amnesia; restlessness; headache; slurred speech; loss of voice; stupor; coma; euphoria; irritability; vivid dreams; psychomotor retardation; paradoxical reactions (e.g., anger, hostility, mania, insomnia, muscle spasms); syncope; extrapyramidal symptoms.
GI: Constipation; diarrhea; nausea; anorexia; vomiting.
MISC: Dependency/withdrawal syndrome.

CLINICAL IMPLICATIONS

General

When used or prescribed by DDS:
- Geriatric, debilitated, and pediatric patients are more sensitive to the CNS effects of benzodiazepines.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Place on frequent maintenance schedule to avoid periodontal inflammation.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Lactation:* Excreted in breast milk.
- *Children:* Initial dose should be small and gradually increased. Oral form not recommended in children younger than 6 yr; parenteral form not recommended in children younger than 12 yr.

- *Elderly:* Initial dose should be small and gradually increased. Use with caution in patients with limited pulmonary reserve.
- *Renal failure:* Observe caution to avoid accumulation of drug.
- *Hepatic failure:* Observe caution to avoid accumulation of drug.
- *Debilitated patients:* Initial dose should be small and gradually increased. Use with caution in patients with limited pulmonary reserve.
- *Drug dependency:* Prolonged use can lead to dependency. Withdrawal syndrome has occurred within 4 to 6 wk of treatment, especially if drug is abruptly discontinued. For discontinuation after long-term treatment, use caution and taper dosage.
- *Psychiatric disorders:* Not intended for patients with primary depressive disorder, psychosis, or disorders in which anxiety is not prominent.
- *Parenteral administration:* Reserved primarily for acute states.
- *Suicide:* Use with caution in patients with suicidal tendencies; do not allow access to large quantities of drug.
- *Overdosage:* Drowsiness, confusion, somnolence, impaired coordination, diminished reflexes, lethargy, ataxia, hypotonia, hypotension, hypnosis, coma, death.
- *Injection:* Ensure that a benzodiazepine-receptor antagonist (e.g., flumazenil), oxygen, and resuscitation and intubation equipment are available when medication is administered by IV injection.

Pregnancy Risk Category: Category D.

Oral Health Education

When used or prescribed by DDS:

- May produce sedation, interfere with eye-hand coordination, and the ability to operate mechanical equipment. Inform patient not to drive, sign important papers, or operate mechanical equipment.
- Warn patient not to drink alcoholic beverages while taking the drug.
- Explain name, dose, action, and potential side effects of drug.
- Advise patient or caregiver to read the *Patient Information* leaflet before starting therapy and with each refill.
- Advise patient that medication is usually started at a low dose and then gradually increased until maximum benefit is obtained.
- Caution patient that medication may be habit forming and to take as prescribed; patient should not stop taking the drug or change the dosage unless advised to do so by health care provider.
- Advise patient to take each dose without regard to meals but to take with food if stomach upset occurs.
- Advise patient that if a dose is missed to skip that dose and take the next dose at the regularly scheduled time. Caution patient to never take two doses at the same time.
- Advise patient that if medication needs to be discontinued, it will be slowly withdrawn unless safety concerns (e.g., rash) require a more rapid withdrawal.
- Instruct patient to avoid alcoholic beverages and other depressants while taking this medication.
- Advise patient with anxiety to take medication as needed and to seek alternative methods for controlling or preventing anxiety (e.g., stress reduction, counseling).
- Instruct patient to contact health care provider if symptoms do not appear to be getting better, are getting worse, or if bothersome side effects (e.g., drowsiness, memory impairment) occur.
- Advise patient that drug may cause drowsiness or impair judgment, thinking, or reflexes and to use caution while driving or performing other tasks requiring mental alertness until tolerance is determined.
- Advise women to notify health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Warn patient not to take any prescription or OTC drugs or dietary supplements without consulting health care provider.
- Advise patient that follow-up visits and lab tests may be necessary to monitor therapy and to keep appointments.

Injection

- Advise patient or caregiver that medication will be prepared by a health care provider and administered in a health care setting under close observation when oral therapy is not feasible.

chlorhexidine gluconate (klor-HEX-ih-deen GLUE-koe-nate)

Peridex: Oral Rinse: 0.12%
PerioGard: Oral Rinse: 0.12%
PerioChip: Chip: 2.5 mg

Apo-Chlorhexidine

Drug Class: Antiseptic, germicide

PHARMACOLOGY

Action

Provides antimicrobial effect against a wide range of microorganisms.

Uses

Oral rinse for gingivitis; an adjunct to scaling and root planning procedures for reduction of pocket depth in adults with periodontitis.

Unlabeled Uses

Treatment of acne vulgaris. Amelioration of oral mucositis associated with cytoreductive therapy for bone marrow transplant candidates.

Contraindications

Standard considerations.

Usual Dosage

Periodontitis

2.5 mg (1 chip) inserted into periodontal pocket with probing depth at least 5 mm.

Oral rinse for gingivitis

15 mL (1 capful) bid for 30 sec, morning and evening after brushing teeth. Expectorate after rinsing; do not swallow.

DRUG INTERACTIONS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Staining of teeth and oral surfaces; increased calculus formation; minor irritation and superficial desquamation of oral mucosa; taste disturbance.

CLINICAL IMPLICATIONS

General

When prescribed by DDS:

- *Lactation:* Undetermined.
- *Overdosage:* Gastric distress, alcohol intoxication.
- Obtain patient history, including drug history and any known allergies.
- Monitor for allergic reactions (e.g., urticaria, bronchospasm, cough, shortness of breath).
- Monitor skin and mouth for irritation.

Pregnancy Risk Category: Category B (oral rinse).

Oral Health Education

When prescribed or used by DDS:

- Inform patient that staining of teeth, dental work, tongue, and oral tissue may occur. Staining does not adversely affect health and can usually be removed by professional techniques.
- Caution patient that taste perception may be altered during treatment; permanent taste alteration has not been noted.
- Inform patient that oral rinse contains alcohol.
- Instruct patient to avoid having medication come into contact with ears and eyes, which could cause permanent damage.

- Instruct patient not to swallow product but to expectorate after oral rinsing.
- Advise patient to avoid eating 2 to 3 hr after treatment.

Chip

- Advise patients to avoid dental floss at the site of chip insertion for 10 days after placement because flossing might dislodge the chip.
- Instruct patient to notify dentist promptly if chip dislodges.
- Advise patient that although mild to moderate sensitivity is normal during the first wk after placement of the chip, notify dentist if pain, swelling, or other problems occur.

chloroquine (KLOR-oh-kwin)

(chloroquine HCl, chloroquine phosphate)

Aralen HCl, Aralen Phosphate

Aralen

Drug Class: Anti-infective; Antimalarial

PHARMACOLOGY

Action

Inhibits parasite growth, possibly by concentrating within parasite acid vesicles, raising pH.

Uses

Prophylaxis and treatment of acute attacks of malaria caused by *Plasmodium vivax*, *P. malariae*, *P. ovale*, and susceptible strains of *P. falciparum*; extraintestinal amebiasis.

Unlabeled Uses

Treatment of rheumatoid arthritis, systemic and discoid lupus erythematosus, porphyria cutanea tarda, scleroderma, pemphigus, lichen planus, polymyositis, and sarcoidosis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Acetaminophen: Possible chloroquine toxicity (mechanism unknown)

- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Lichen planus–like eruptions.
CNS: Headache; neuropathy; seizures; psychotic episodes.
CVS: Hypotension.
GI: Anorexia; nausea; vomiting; diarrhea; abdominal cramps.
MISC: Muscle weakness; photophobia; agranulocytosis; blood dyscrasia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *For patients taking this drug on a long-term basis:* Monitor vital signs. Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- If GI side effects occur, consider semisupine chair position.
- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.

chlorothiazide (klor-oh-THIGH-uh-zide)

Diurigen, Diuril

Drug Class: Thiazide diuretic

PHARMACOLOGY

Action

Enhances excretion of sodium, chloride, and water by interfering with transport of sodium ions across renal tubular epithelium.

Uses
Adjunctive treatment in edema associated with CHF, cirrhosis, and corticosteroid and estrogen therapy; edema caused by various forms of renal dysfunction such as nephrotic syndrome, acute glomerulonephritis, and chronic renal failure (oral and IV); management of hypertension (oral).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

Sympathomimetic amines: Hypokalemia (increased Intracellular uptake of potassium)
- Use local anesthetic agents containing a vasoconstrictor with caution.
- Monitor blood pressure and pulse rate.

ADVERSE EFFECTS
⚠ **ORAL:** Sialoadenitis.
CNS: Vertigo; paresthesia; dizziness; headache; restlessness.
CVS: Hypotension, orthostatic hypotension.
MISC: Photosensitivity; blood dyscrasia (leukopenia, thrombocytopenia, agranulocytosis, aplastic anemia, hemolytic anemia).
GI: Pancreatitis; diarrhea; vomiting; cramping; constipation; gastric irritation; nausea; anorexia.
RESP: Respiratory distress (e.g., pneumonitis, pulmonary edema).

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Monitor pulse rhythm to assess for electrolyte imbalance.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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chlorpheniramine maleate (klor-fen-AIR-uh-meen MAL-ee-ate)
Aller-Chlor, Allergy, Chlo-Amine, Chlor-Trimeton Allergy 12 Hour, Chlor-Trimeton Allergy 8 Hour, Efidac 24

 **Chlor-Tripolon**

Drug Class: Alkylamine; Antihistamine

PHARMACOLOGY
Action
Competitively antagonizes histamine at H_1 receptor sites.

Uses
Temporary relief of sneezing; itchy, watery eyes; itchy nose or throat; and runny nose caused by hay fever (allergic) rhinitis or other respiratory allergies.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Drowsiness (often transient); sedation; dizziness; faintness; disturbed coordination; nervousness; restlessness.

GI: Epigastric distress; anorexia; nausea; vomiting; diarrhea; constipation; change in bowel habits.

RESP: Thickening of bronchial secretions; chest tightness; wheezing; nasal stuffiness; dry nose and throat; sore throat; respiratory depression.

MISC: Hypersensitivity reactions; photosensitivity.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Consider semisupine chair position to control effects of postnasal drainage.
- Be aware that patients with multiple allergies are at increased risk for allergy to dental drugs.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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chlorpromazine HCl (klor-PRO-muh-zeen HIGH-droe-KLOR-ide)

Chlorpromazine Hydrochloride, Thorazine

Largactil

Drug Class: Antipsychotic, Phenothiazine; Antiemetic

PHARMACOLOGY

Action

Effects apparently caused by dopamine receptor blockade in CNS.

Uses

Management of manic phase of manic-depressive disorder; treatment of schizophrenia; relief of anxiety and restlessness prior to surgery; adjunct in treatment of tetanus; management of acute intermittent porphyria and severe behavioral and conduct disorders in children 1 to 12 yr of age; control of nausea and vomiting; relief of intractable hiccups.

Unlabeled Uses

Treatment of migraine headaches (IM or IV forms).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, tardive dyskinesia, angioneurotic edema.

CNS: Faintness; drowsiness; dystonias; dizziness; extrapyramidal side effects (e.g., pseudoparkinsonism); muscle spasms; motor restlessness; headache; weakness; tremor; fatigue; slurring; insomnia; vertigo; seizures; sedation; neuroleptic malignant syndrome; cerebral edema.

CVS: Postural hypotension; tachycardia.

GI: Dyspepsia; constipation; adynamic ileus (with possible complications resulting in death); nausea; atonic colon; obstipation.
RESP: Laryngospasm; bronchospasm; dyspnea; aspiration pneumonia; asthma; laryngeal edema.
MISC: Increased appetite and weight; polydipsia; heat stroke/hyperpyrexia; sudden death; anaphylactoid reactions; systemic lupus erythematosus–like syndrome; increased prolactin levels; photosensitivity; leukopenia; anemia; agranulocytosis.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- *Geriatric patients:* Use lower dose.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Monitor vital signs.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Evaluate manual dexterity; consider need for power toothbrush.

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chlorpropamide (klor-PRO-puh-mide)

Diabinese

APO-Chlorpropamide

Deavynfar, Insogen

Drug Class: Antidiabetic, sulfonylurea

PHARMACOLOGY

Action

Decreases blood glucose by stimulating insulin release from pancreas.

Uses

Adjunct to diet to lower blood glucose in patients with type 2 diabetes mellitus whose hyperglycemia cannot be controlled by diet alone.

Unlabeled Uses

Control of neurogenic diabetes insipidus.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Taste alteration; lichenoid reactions; thirst.
CNS: Dizziness; vertigo.
CVS: Arrhythmia; hypertension.
GI: GI disturbances (e.g., nausea, epigastric fullness, heartburn).
RESP: Rhinitis; dyspnea; pharyngitis.
MISC: Disulfiram-like reaction; weakness; paresthesia; fatigue; malaise; photosensitivity; blood dyscrasias (e.g., leukopenia, agranulocytosis, anemia, thrombocytopenia).

CLINICAL IMPLICATIONS

General

- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated.
- Monitor blood pressure because hypertension and dyslipidemia (CAD) are prevalent in diabetes mellitus.
- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Observe for signs of hypoglycemia (e.g., confusion, argumentativeness, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- Ensure patient has taken medication and eaten meal.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin or Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- Medical consult advised if fasting blood glucose (FBG) is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- If insulin is used, consider time of peak hypoglycemic effect.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.
- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.

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chlorthalidone (klor-THAL-ih-dohn)

Hygroton

Apo-Chlorthalidone

Higroton

Drug Class: Thiazide diuretic

PHARMACOLOGY

Action

Inhibits reabsorption of sodium and chloride in proximal portion of distal convoluted tubules.

Uses

Reduction of edema associated with CHF, cirrhosis, renal dysfunction, and corticosteroid and estrogen therapy; management of hypertension.

Unlabeled Uses

Treatment of calcium nephrolithiasis, osteoporosis, diabetes insipidus.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decrease antihypertensive effects (decreased prostaglandin synthesis)
- Monitor blood pressure.

ADVERSE EFFECTS

CNS: Dizziness; lightheadedness; vertigo; headache; paresthesias; weakness; restlessness; insomnia.

GI: Anorexia; gastric irritation; nausea; vomiting; abdominal pain or cramping; bloating; diarrhea; constipation; pancreatitis.

MISC: Muscle cramps or spasms; photosensitivity; blood dyscrasias (aplastic anemia, agranulocytosis, thrombocytopenia, leukopenia).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Monitor pulse rhythm to assess for electrolyte imbalance.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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cholestyramine (koe-less-TIE-ruh-meen)

LoCHOLEST, LoCHOLEST Light, Prevalite, Questran, Questran Light

Novo-Cholamine, Novo-Cholamine Light

Drug Class: Antihyperlipidemic, bile acid sequestrant

PHARMACOLOGY

Action

Increases removal of bile acids from body by forming insoluble complexes in intestine, which are then excreted in feces. As body loses bile acids, it converts cholesterol from blood to bile acid, thus lowering serum cholesterol.

Uses

Reduction of serum cholesterol in patients with primary hypercholesterolemia; relief of pruritus associated with partial biliary obstruction.

Unlabeled Uses

Treatment of antibiotic-induced pseudomembranous colitis, bile salt-mediated diarrhea, and digitalis toxicity.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Acetaminophen: Decreased acetaminophen effect (decreased metabolism)
- Instruct patient to take acetaminophen 1 hr before cholestyramine.
- Monitor clinical status.

Metronidazole: Possible decreased metronidazole effect (decreased absorption)
- Avoid concurrent use.

Ibuprofen or naproxen: Possible decreased ibuprofen or naproxen effect
- Instruct patient to take ibuprofen 2 hr before or 6 hr after cholestyramine.
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Bleeding tendency (due to hypoprothrombinemia); dental caries; taste disturbance.

GI: Constipation (can be severe and at times accompanied by fecal impaction); aggravation of hemorrhoids; abdominal pain and distention; bleeding; belching; flatulence; nausea; vomiting; diarrhea; heartburn; anorexia; steatorrhea.

CVS: Tachycardia (infrequent).

MISC: Prolonged PT time; ecchymosis.

CLINICAL IMPLICATIONS

General

- High LDL cholesterol concentration is the major cause of atherosclerosis, which leads to CAD (e.g., angina, MI); determine degree of CV health and ability to withstand stress of dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- If GI side effects occur, consider semisupine chair position.
- Monitor frequently to ensure adequate clotting during treatment that involves bleeding.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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cimetidine (sigh-MET-ih-deen)

Tagamet, Tagamet HB

Apo-Cimetidine, Gen-Cimetidine, Novo-Cimetine, Nu-Cimet

Blocan, Cimetase, Cimetigal, Columina, Ulcedine, Zymerol

Drug Class: Histamine H_2 antagonist

PHARMACOLOGY

Action

Reversibly and competitively blocks histamine at H_2 receptors, particularly those in gastric parietal cells, leading to inhibition of gastric acid secretion.

Uses

Management of duodenal ulcer; treatment of gastroesophageal reflux disease (GERD), including erosive esophagitis; therapy for benign gastric ulcer; treatment of pathological hypersecretory conditions; prevention of upper GI bleeding.

Unlabeled Uses

Prevention of aspiration pneumonia and stress ulcers; herpes virus infection; chronic idiopathic urticaria; anaphylaxis (relieves dermatological symptoms only); dyspepsia; used before anesthesia to prevent aspiration pneumonitis; treatment of hyperparathyroidism and control of secondary hyperparathyroidism in chronic hemodialysis patient; treatment of chronic viral warts in children.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole or itraconazole: Decreased ketoconazole or itraconazole effect (decreased absorption)
- Avoid concurrent use.

Aspirin: Possible aspirin toxicity (decreased metabolism)
- Avoid concurrent use.

Benzodiazepines: Possible benzodiazepine toxicity (decreased metabolism)
- Monitor clinical status.

Bupivacaine: Possible bupivacaine toxicity (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS

CNS: Headache; somnolence; fatigue; dizziness; confusional states; hallucinations.

GI: Diarrhea.

RESP: Bronchospasm.

MISC: Gynecomastia; hypersensitivity reactions; transient pain at injection site; reversible exacerbation of joint symptoms with preexisting arthritis, including gouty arthritis.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If patient has GI disease, consider semisupine chair position.
- Drugs that lower acidity in intestinal tract may interfere with absorption of some antibiotics (e.g., penicillin, tetracyclines).
- Use COX inhibitors with caution, they may exacerbate PUD and GERD.

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ciprofloxacin (sip-ROW-FLOX-uh-sin)

Ciloxan, Cipro, Cipro IV, Cipro XR, Proquin XR

Cimogal, Ciprobiotic, Ciproflox, Ciprofur, Ciproxina, Italnik, Kenzoflex, Microrgan, Mitroken, Nivoflox, Novoquin, Quinoflox, Sophixin, Suiflox, Zipra

Drug Class: Antibiotic, fluoroquinolone

PHARMACOLOGY

Action

Interferes with microbial DNA synthesis.

Uses

Treatment of infections of lower respiratory tract, skin and skin structure, bones and joints, and urinary tract; gonorrhea, chancroid, and infectious diarrhea caused by susceptible strains of specific organisms; typhoid fever; uncomplicated cervical and urethral gonorrhea; women with acute uncomplicated cystitis; acute sinusitis; nosocomial pneumonia; chronic bacterial prostatitis; complicated intra-abdominal infections; reduction of incidence or progression of inhalational anthrax following exposure to aerosolized *Bacillus anthracis*.

Cipro IV: Empirical therapy for febrile neutropenic patients.

Cipro XR: Uncomplicated and complicated UTIs; acute uncomplicated pyelonephritis.

Ophthalmic Use: Treatment of corneal ulcers and conjunctivitis caused by susceptible organisms.

Unlabeled Uses

Treatment of pulmonary exacerbations associated with cystic fibrosis; management of malignant external otitis, traveler's diarrhea, mycobacterial infections.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Diazepam: Possible diazepam toxicity (decreased metabolism)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Dry, painful mouth (<1%); dysphagia.
CNS: Headache, restlessness (1%); agitation, confusion, delirium, toxic psychosis.
CVS: Hypertension, palpitations, syncope (<1%).
GI: Nausea (5%); diarrhea, vomiting, abdominal pain/discomfort (2%); constipation, flatulence, dyspepsia, pseudomembranous colitis.
MISC: Anaphylactic reactions, pancreatitis, vasculitis, photosensitivity (<1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- If prescribed by the DDS, ensure patient knows how to take the drug, how long it should be taken, and to report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset) immediately. See Chapter 4: *Medical Management of Odontogenic Infections*.
- Antibiotic-associated diarrhea can occur. Have patient contact DDS immediately if signs develop.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.

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citalopram (sye-TAL-oh-pram)

Celexa

Seropram

Drug Class: Antidepressant, selective serotonin reuptake inhibitor

PHARMACOLOGY

Action

Inhibits the CNS neuronal uptake of serotonin, potentiating serotonergic activity.

Uses

Treatment of major depression.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Tramadol: Increased risk of seizure (additive)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (20%); dental caries; taste perversion (>1%).
CNS: Dizziness; insomnia; somnolence; agitation; anxiety; anorexia; decreased libido; yawning; tremor.
CVS: Postural hypotension, tachycardia (>1%).
GI: Nausea; vomiting; diarrhea; dyspepsia.
RESP: Rhinitis, URI (5%); sinusitis (3%); cough (>1%).
MISC: Asthenia; arthralgia; fatigue; fever; myalgia; sweating.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

- If GI or respiratory side effects occur, consider semisupine chair position.
- Monitor vital signs.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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clarithromycin (kluh-RITH-row-MY-sin)

Biaxin, Biaxin XL

Biaxin BID

Adel, Klaricid, Mabicrol

Drug Class: Antibiotic, macrolide

PHARMACOLOGY

Action

Inhibits microbial protein synthesis.

Uses

Treatment of infections of respiratory tract, skin and skin structure; treatment of disseminated atypical mycobacterial infections caused by susceptible strains of specific microorganisms. Prevention of disseminated *Mycobacterium avium* complex disease in patients with advanced HIV infection. Clarithromycin in combination with omeprazole is indicated for the treatment of patients with an active duodenal ulcer associated with *Helicobacter pylori* infection.

CHILDREN: Acute otitis media.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Triazolam or midazolam: Possible triazolam or midazolam toxicity (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Abnormal taste (3%); glossitis; stomatitis; candidiasis.

CNS: Headache; dizziness; insomnia; nightmares; vertigo.

GI: Diarrhea; nausea; vomiting; dyspepsia; abdominal pain/discomfort.

RESP: Dyspnea; increased cough.

MISC: Urticaria; hypersensitivity; anaphylaxis; Stevens-Johnson syndrome.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- If prescribed by the DDS, ensure patient knows how to take the drug, how long it should be taken, and to report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset) immediately. See Chapter 4: *Medical Management of Odontogenic Infections*.
- Antibiotic-associated diarrhea can occur. Have patient contact DDS immediately if signs develop.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.
- If GI side effects occur, consider semisupine chair position.

clemastine fumarate (KLEM-ass-teen FEW-muh-rate)

Clemastine Fumarate, Dayhist-1, Tavist Allergy

Tavist

Drug Class: Antihistamine, Ethanolamine

PHARMACOLOGY

Action

Competitively antagonizes histamine at H_1 receptor sites.

Uses

Relief of symptoms associated with allergic rhinitis or other upper respiratory allergies, such as sneezing, rhinorrhea, pruritus, and lacrimation; relief of mild, uncomplicated allergic skin manifestation of urticaria and angioedema.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Stomatitis, dry mouth; (nasal spray) aphthous stomatitis, bitter, taste, taste loss.

CNS: Acute labyrinthitis; confusion; convulsions; disturbed coordination; dizziness; euphoria; excitation; fatigue; hysteria; insomnia; irritability; nervousness; neuritis; paresthesias; restlessness; sedation; sleepiness; tremor; vertigo.

CVS: Postural hypotension; bradycardia or tachycardia; palpitation.

GI: Epigastric distress; nausea; vomiting; diarrhea; constipation.

RESP: Thickening of bronchial secretions; chest tightness; wheezing; nasal stuffiness; dry nose and throat; sore throat; respiratory depression.

MISC: Hypersensitivity reactions; photosensitivity.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider semisupine chair position to control effects of postnasal drainage.
- Be aware that patients with multiple allergies are at increased risk for allergy to dental drugs.
- Monitor vital signs.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

clindamycin (KLIN-duh-MY-sin)

(clindamycin HCl, clindamycin palmitate HCl, clindamycin phosphate)

Cleocin: Capsules: 75, 150, 300 mg (as HCl)
Cleocin Pediatric: Granules for Oral Solution: 75 mg per 5 mL (as palmitate)
Cleocin, Cleocin Phosphate, Cleocin T, Clindets, Clindagel, ClindaMax, ClindaMax Lotion

Dalacin C Phosphate, Dalacin T Topical, Dalacin C, ratio-Clindamycin

Drug Class: Antibiotic, lincosamide

PHARMACOLOGY

Action

Suppresses bacterial protein synthesis.

Uses

Treatment of serious infections caused by susceptible strains of specific microorganisms; treatment of acne vulgaris (topical use); treatment of bacterial vaginosis (vaginal use).

Contraindications

Hypersensitivity to lincosamides or any product component; history of regional enteritis, ulcerative colitis, or antibiotic-associated colitis.

Usual Dosage

Orodental infection

ADULTS: *PO:* 150 to 300 mg q 6 hr. *IM/IV:* 0.6 to 2.7 g/day divided into 2 to 4 equal doses. For more serious infections, these doses may need to be increased. Do not use more than 600 mg in single IM injection.

CHILDREN: CLINDAMYCIN HCL: *PO:* 8 to 20 mg/kg/day divided into 3 to 4 doses.

CLINDAMYCIN PALMITATE HCL: *PO:* 8 to 25 mg/kg/day divided into 3 to 4 doses.

Pharmacokinetics

ABSORP: *Oral:* Rapidly absorbed. C_{max} is 2.5 mcg/mL. T_{max} is 45 min. Bioavailability is 90%. *IM:* T_{max} is 3 hr (adults) and 1 hr (children). *IV:* C_{max} is 7 to 14 mcg/mL. *Vaginal:* About 5% is absorbed.

DIST: Widely distributed (including bones); no significant levels attained in CSF. Excreted in breast milk.

METAB: Rapidly converted to active clindamycin.

EXCRET: The $t_{1/2}$ is 2.4 to 3.2 hr. About 10% of bioactivity is excreted in the urine and 3.6% in the feces; the remainder is excreted as inactive metabolites.

SPECIAL POP: *Renal failure:* The $t_{1/2}$ is increased slightly. Dosage adjustment is not usually needed.

Hepatic failure: The $t_{1/2}$ is increased slightly. Dosage adjustment is not usually needed.

Elderly: The $t_{1/2}$ is increased slightly. Dosage adjustment is not usually needed.

DRUG INTERACTIONS

Cyclosporine: Possible decreased cyclosporine effect (mechanism unknown)

- Avoid concurrent use or monitor cyclosporine concentration.

ADVERSE EFFECTS

⚠ **ORAL:** Unpleasant taste, esophagitis.

CVS: Hypotension; cardiopulmonary arrest.

GI: Colitis, including pseudomembranous colitis (0.01% to 10%, more frequent with oral administration); diarrhea; nausea; vomiting; abdominal pain; esophagitis; anorexia.

HEMA: Neutropenia; leukopenia; agranulocytosis; thrombocytopenic purpura.

MISC: Pain after injection; induration and sterile abscess after IM injection; thrombophlebitis after IV infusion; anaphylaxis; transient eosinophilia, polyarthritis (rare); hypersensitivity (skin rash, urticaria, erythema multiforme, anaphylaxis); jaundice, liver function abnormalities. Topical or vaginal use may theoretically produce adverse effects seen with systemic use as a result of absorption.

CLINICAL IMPLICATIONS

General

When prescribed by DDS:

- *Lactation:* Excreted in breast milk.
- *Elderly:* May not tolerate diarrhea well (dehydration).

- *Hypersensitivity:* Use drug with caution in patients with asthma or significant allergies or in those who are atopic.
- *Renal failure:* Use drug with caution in patients with severe renal disease with severe metabolic aberrations. Dosage modifications may be necessary.
- *Hepatic failure:* Use drug with caution in patients with severe hepatic disease with severe metabolic aberrations.
- *Superinfection:* May result in bacterial or fungal overgrowth of nonsusceptible organisms.
- *Tartrazine sensitivity:* Some products contain tartrazine, which may cause allergic-type reactions in susceptible individuals.
- Monitor for signs of infection, especially fever, and for positive response to antibiotic therapy.
- Monitor patient for GI, dermatological, and general body side effects, and signs of superinfection. Report to health care provider if noted and significant. Immediately report severe diarrhea, diarrhea containing blood or pus, or severe abdominal cramping.

Pregnancy Risk Category: Category B.

Oral Health Education

When prescribed by DDS:

- Explain name, dose, action, and potential side effects of drug.
- Instruct patient to take exactly as prescribed and not to change the dosage or discontinue therapy unless advised by health care provider.
- Instruct patient to complete entire course of therapy, even if symptoms of infection have disappeared.
- Instruct patient to notify health care provider if infection does not appear to be improving or appears to be getting worse.
- Advise patient to report the following signs of superinfection to health care provider: black "furry tongue," white patches in mouth, foul-smelling stools, or vaginal itching or discharge.
- Warn patient that diarrhea containing blood or pus may be a sign of a serious disorder and to seek medical care if noted and not treat at home. Caution patient that this may occur even wk after completing therapy.
- Advise patient to report any other bothersome side effect to health care provider.
- Advise women to notify health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Instruct patient not to take any prescription or OTC medications, dietary supplements, or herbal preparations unless advised by health care provider.
- Advise patient that follow-up examinations and laboratory tests may be required to monitor therapy and to keep appointments.

Capsules and Oral Solution

- Advise patient or caregiver that capsules and oral solution can be taken without regard to meals but to take with food if stomach upset occurs.
- Advise patient to take capsules with a full glass of water.
- Advise patient or caregiver that oral solution should be administered using a dosing spoon or syringe.

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clobetasol propionate (kloe-BEE-tah-sahl PRO-pee-oh-nate)

Cormax: Ointment: 0.05%
Temovate: Cream: 0.05%; Gel: 0.05%; Ointment: 0.05%
Clobex, Olux, Temovate Emollient

Dermovate, Gen-Clobetasol Cream/Ointment, Gen-Clobetasol Scalp Application, Novo-Clobetasol

Drug Class: Corticosteroid, topical

PHARMACOLOGY

Action

Topical glucocorticoid with anti-inflammatory, antipruritic, and vasoconstrictive properties. Thought to act by inducing phospholipase A_2 inhibitory proteins, thus controlling biosynthesis of potent mediators of inflammation.

Uses

Relief of inflammatory and ulcerative conditions (Temovate); pruritic manifestations of corticosteroid-responsive dermatoses; moderate to severe plaque-type psoriasis.

Contraindications

Primary scalp infections (scalp application formulation). Standard considerations.

Usual Dosage

Oral inflammatory ulceration

Topical: Apply thin film to affected area qid.

DRUG INTERACTIONS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

MISC: Burning; itching; erythema; cracking of skin.

CLINICAL IMPLICATIONS

General

When prescribed by DDS:

- *Lactation:* Undetermined.
- *Children:* Not recommended in children younger than 12 yr of age. Children are at higher risk than adults of hypothalamic-pituitary-adrenal (HPA) axis suppression and Cushing syndrome when they are treated with topical corticosteroids.
- *Systemic:* Systemic absorption may produce HPA axis suppression and systemic side effects; HPA axis suppression shown at doses as low as 2 g/day.
- Therapy should be discontinued when control has been achieved. If no improvement is seen within 2 wk, reassessment of the diagnosis may be necessary.
- Obtain patient history, including drug history and any known allergies.

Pregnancy Risk Category: Category C.

Oral Health Education

When prescribed by DDS:

- Explain name, action, and potential side effects of drug.
- Teach patient or caregiver proper technique for applying cream, ointment, lotion, or gel: wash hands; apply sufficient cream or ointment to cover affected areas sparingly and gently massage into skin; wash hands after applying cream or ointment.
- Advise patient to apply medication as directed by health care provider.
- Advise patient that if a dose is missed to apply it as soon as remembered and then continue on regular schedule. If it is almost time for the next application, instruct patient to skip the dose and continue on regular schedule. Caution patient not to apply double doses.
- Caution patient to avoid contact with the eyes. Advise patient that if medication does come into contact with the eyes, to wash eyes with large amounts of cool water and contact health care provider if eye irritation occurs.
- Advise patient that symptoms should begin to improve fairly soon after starting treatment and to notify health care provider if condition does not improve, worsens, or if application site reactions (e.g., burning, stinging, redness, itching) develop.
- Advise patient that therapy is usually discontinued when control has been achieved.
- Advise women to notify health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Caution patient not to take any prescription or OTC drugs, dietary supplements, or herbal preparations without consulting health care provider.
- Advise patient that follow-up visits to monitor response to treatment may be required and to keep appointments.

clocortolone pivalate (kloe-CORE-toe-lone PIH-vah-late)

Cloderm: Cream: Clocortolone pivalate 0.1%
Drug Class: Corticosteroid, topical (group III medium potency)

PHARMACOLOGY

Action

Topically applied corticosteroids diffuse across cell membranes to interact with cytoplasmic receptors located in both the dermal and intradermal cells similar to effects caused by systemic corticosteroids. Primary effect is due to an anti-inflammatory activity that is nonspecific.

Uses

Relief of inflammatory and pruritic manifestations of corticosteroid-responsive dermatoses: Some of the conditions in which topical corticosteroids have been proven effective include contact dermatitis, atopic dermatitis, nummular eczema, stasis eczema, asteatotic eczema, lichen planus, lichen simplex chronicus, insect and arthropod bite reactions, first- and sec-degree localized burns, and sunburn.
Alternative/adjunctive treatment: Psoriasis, seborrheic dermatitis, severe diaper rash, dysidrosis, nodular prurigo, chronic discoid lupus erythematosus, alopecia areata, lymphocytic infiltration of the skin, mycosis fungoides, and familial benign pemphigus of Hailey-Hailey.
Possibly effective in the following conditions: Bullous pemphigoid, cutaneous mastocytosis, lichen sclerosus et atrophicus, and vitiligo.
Nonprescription hydrocortisone preparations: Temporary relief of itching associated with minor skin irritations, inflammation and rashes due to eczema, insect bites, poison ivy, poison oak, poison sumac, soaps, detergents, cosmetics, jewelry, seborrheic dermatitis, psoriasis, and external genital and anal itching.

Contraindications

Hypersensitivity to any component; monotherapy in primary bacterial infections such as impetigo, paronychia, erysipelas, cellulitis, angular cheilitis, erythrasma (clobetasol), treatment of rosacea, perioral dermatitis, or acne; use on the face, groin, or axilla (very high or high-potency agents); ophthalmic use (prolonged ocular exposure may cause steroid-induced glaucoma and cataracts). When applied to the eyelids or skin near the eyes, the drug may enter the eyes.

Usual Dosage

Mucous membrane inflammation or ulceration
CREAM 0.1%
ADULTS: Apply sparingly to affected areas 2 to 4 times daily.
CHILDREN: Limit to smallest amount compatible with therapy.

Pharmacokinetics

ABSORP: Absorbed systemically, especially when applied over large surface area.

DRUG INTERACTIONS

No documented drug-drug interactions significant to dentistry. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Perioral dermatitis; thinning of mucosa.
MISC: Burning; dryness; itching.

CLINICAL IMPLICATIONS

General

- Anticipate oral candidiasis when steroids are used.

Pregnancy Risk Category: Category C.

Oral Health Education

If prescribed by DDS:

- Ensure patient understands how to use product, amount to apply, method of application, and signs of adverse effects.
- Apply ointments, creams, or gels sparingly in a light film; rub in gently. Washing or soaking the area before application may increase drug penetration.
- Use only as directed. Do not put bandages, dressing, cosmetics, or other skin products over the treated area unless directed by your physician.
- Notify dentist if the condition being treated gets worse, or if burning, swelling, or redness develops.
- Avoid prolonged use on the face and in skin creases unless directed by dentist. Avoid contact with the eyes.
- If you forget a dose, apply it as soon as you remember and continue on your regular schedule. If it is almost time for the next application, wait and continue on your regular schedule. Do not apply double doses.
- *For parents of pediatric patients:* Do not use tight-fitting diapers or plastic pants on a child treated in the diaper area; these garments may work like occlusive dressings and cause more of the drug to be absorbed into your child's body.

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clomipramine HCl (kloe-MIH-pruh-meen HIGH-droe-KLOR-ide)

Anafranil

Apo-Clomipramine, Gen-Clomipramine, Novo-Clopamine

Drug Class: Tricyclic antidepressant

PHARMACOLOGY

Action

Inhibits reuptake of serotonin in CNS.

Uses

Relief of obsessive-compulsive disorder.

Unlabeled Uses

Treatment of panic disorder or chronic pain (e.g., migraine, chronic tension headache, diabetic neuropathy, tic douloureux, cancer pain, peripheral neuropathy, postherpetic neuralgia, arthritic pain).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole: Possible clomipramine toxicity (decreased metabolism)

- Monitor vital signs.

Tramadol: Increased risk of seizure (additive)

- Avoid concurrent use.

Sympathomimetic amines: Increased risk of hypertension and hypertensive crisis

- Use local anesthetic agents containing a vasoconstrictor with caution.
- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (84%); halitosis, ulcerative stomatitis (2%); tooth disorder (unspecified 5%).

CVS: Postural hypotension (6%); palpitation, tachycardia (4%); syncope (2%).

CNS: Dizziness, somnolence, tremor (54%); headache (52%); insomnia (25%); libido change (21%); nervousness (18%); myoclonus (13%); increased appetite (11%); anxiety, impaired memory, paresthesia (9%); twitching (7%); depression, impaired coordination (5%); hypertonia, sleep disorder (4%); abnormal dreaming, agitation, confusion, migraine, psychosomatic disorder, speech disorder, yawning (3%); aggressive reaction, asthenia, depersonalization, emotional lability, irritability, panic disorder, paresis (2%); abnormal thinking, vertigo (at least 1%); confusion, delusion, hallucinations, hypomania, mania, paranoia, psychotic episodes.

GI: Constipation (47%); nausea (33%), dyspepsia (22%); diarrhea (13%); anorexia (12%); abdominal pain (11%); vomiting (7%); flatulence (6%); dysphagia, eructation, GI disorder (2%); esophagitis (1%).

RESP: Bronchospasm (7%); coughing, sinusitis (6%); dyspnea, epistaxis (2%).

MISC: Fatigue (39%); allergy (7%); hot flashes (5%); chest pain, fever, pain (4%); chills, local edema (2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present consult with MD to consider medication changes.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Evaluate manual dexterity; consider need for power toothbrush.

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clonazepam (kloe-NAY-ze-pam)

Klonopin, Klonopin Wafers: Tablets: 0.5, 1, 2 mg; Tablets, orally disintegrating: 0.125, 0.25, 0.5, 1, 2 mg

Apo-Clonazepam, Gen-Clonazepam, Novo-Clonazepam, Nu-Clonazepam, PMS-Clonazepam, ratio-Clonazepam, Rivotril, Rhoxal-clonazepam

Kenoket, Rivotril

Drug Class: Anticonvulsant; Benzodiazepine

DEA Schedule: Schedule IV

PHARMACOLOGY

Action

Potentiates action of GABA, inhibitory neurotransmitter, resulting in increased neuronal inhibition and CNS depression, especially in limbic system and reticular formation.

Uses

Treatment of Lennox-Gastaut syndrome; management of akinetic and myoclonic seizures and absence seizures unresponsive to succinimides; panic disorders.

Unlabeled Uses

Treatment of restless leg syndrome, parkinsonian dysarthria, acute manic episodes of bipolar affective disorder, multifocal tic disorders, and neuralgias; adjunctive therapy for schizophrenia.

Contraindications

Hypersensitivity to benzodiazepines; psychoses; acute narrow-angle glaucoma; significant liver disease; shock; coma; acute alcohol intoxication.

DRUG INTERACTIONS

No documented drug-drug interactions significant to dentistry. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, coated tongue, thirst (infrequent); excess salivation (rare).
CVS: SEIZURE DISORDERS: CV collapse; hypotension; phlebitis or thrombosis at IV sites.
CNS: PANIC DISORDER: Somnolence (50%); dizziness (12%); abnormal coordination (9%); ataxia, depression (8%); memory disturbance (5%); nervousness, reduced intellectual ability, dysarthria (4%); decreased libido (3%); emotional lability, confusion (2%).
SEIZURE DISORDERS: Drowsiness (50%); ataxia (30%); confusion; dizziness; lethargy; fatigue; apathy; memory impairment; disorientation; anterograde amnesia; restlessness; headache; slurred speech; aphonia; stupor; coma; euphoria; irritability; vivid dreams; psychomotor retardation; paradoxic reactions (e.g., anger, hostility, mania, insomnia, muscle spasms).
GI: PANIC DISORDER: Constipation (5%); decreased appetite (3%); abdominal pain (2%).
SEIZURE DISORDERS: Constipation; diarrhea; nausea; anorexia; vomiting.
RESP: PANIC DISORDER: Upper respiratory tract infection (10%); sinusitis (8%); rhinitis, coughing (4%); bronchitis (2%).
MISC: PANIC DISORDER: Fatigue (9%); influenza (5%); allergic reaction, myalgia (4%).
SEIZURE DISORDERS: Dependence/withdrawal syndrome (e.g., confusion, abnormal perception of movement, depersonalization, muscle twitching, psychosis, paranoid delusions, seizures).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Consider medical consult to determine disease control and influence on dental treatment.
- Determine level of disease control, type and frequency of seizure, and compliance with medication regimen.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Geriatric, debilitated, and pediatric patients are more sensitive to the CNS effects of benzodiazepines.
- Monitor vital signs.

Pregnancy Risk Category: Category D.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Evaluate manual dexterity; consider need for power toothbrush.

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clonidine HCl (KLOE-nih-DEEN HIGH-droe-KLOR-ide)

Catapres, Catapres-TTS-1, Catapres-TTS-2, Catapres-TTS-3, Duraclon

APO-Clonidine, Dixarit, Novo-Clonidine, Nu-Clonidine

Catapresan-100

Drug Class: Antihypertensive; Antiadrenergic; Analgesic, centrally acting

PHARMACOLOGY

Action

Stimulates central alpha-adrenergic receptors to inhibit sympathetic cardioaccelerator and vasoconstrictor centers.

Uses
Management of hypertension. Used in combination with opiates for epidural use for relief of cancer pain.

Unlabeled Uses
Treatment of constitutional growth delay in children; diabetic diarrhea; Tourette syndrome; hypertensive urgencies; menopausal flushing; postherpetic neuralgia; diagnosis of pheochromocytoma; ulcerative colitis; reduction of allergen-induced inflammatory reactions in patients with extrinsic asthma; facilitation of smoking cessation; alcohol withdrawal; methadone/opiate detoxification.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth (40%); taste disturbances; angioedema of face and tongue.
CNS: Drowsiness; dizziness; sedation; nightmares; insomnia; nervousness or agitation; headache; fatigue.
CVS: Syncope; postural hypotension; tachycardia or bradycardia; palpitations.
GI: Constipation; anorexia; nausea; vomiting.
MISC: Increased sensitivity to alcohol; pallor; muscle weakness; muscle or joint pain; cramps of lower limbs; weakly positive Coombs test result; thrombocytopenia (rare).

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Thrombocytopenia rarely reported; anticipate increased bleeding.

Oral Health Education
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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clopidogrel (kloh-PID-oh-grel)
Plavix

Drug Class: Antiplatelet, aggregation inhibitor

PHARMACOLOGY
Action
Clopidogrel is a thienopyridine derivative, chemically related to ticlopidine, which inhibits platelet aggregation. It acts by irreversibly modifying the platelet adenosine diphosphate (ADP) receptor. Therefore, platelet aggregation is inhibited for both ADP-mediated and ADP-amplified (by other agonists) platelet activation. Consequently, platelets exposed to clopidogrel are affected for the remainder of their lifespan.

Uses
Reduction of atherosclerotic events (e.g., MI, stroke, vascular death) in patients with atherosclerosis documented by recent stroke, recent MI, or established peripheral arterial disease. Treatment of acute coronary syndrome (i.e., unstable angina/non-Q-wave MI), including patients managed medically and those managed with percutaneous coronary intervention (with or without stent) or coronary artery bypass graft.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
COX-1 inhibitors: Possible increased bleeding (additive)
- Avoid concurrent use.

ADVERSE EFFECTS
⚠ **ORAL:** Taste disorder.
CNS: Headache (8%); dizziness (6%); depression (4%); confusion; hallucinations.
CVS: Chest pain; edema, hypertension (4%).
GI: Abdominal pain (6%); dyspepsia, diarrhea (5%); nausea (3%); colitis (including ulcerative or lymphocytic).
RESP: URI (9%); dyspnea (5%); rhinitis, bronchitis (4%); coughing (3%); influenza-like syndrome (8%); bronchospasm.
MISC: Accidental injury, pain (6%); fatigue (3%); hypersensitivity reactions; anaphylactoid reactions; thrombocytopenia.

CLINICAL IMPLICATIONS
General
- Ensure that clopidogrel is discontinued 5 days prior to elective surgery in patients in whom an antiplatelet effect is not desired.
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine bleeding time before completing procedures that may result in significant bleeding. Safe levels are <20 min.
- If uncontrolled bleeding develops, use hemostatic agents and positive pressure to induce hemostasis. Do not dismiss patient until bleeding is controlled.
- Thrombocytopenia rarely reported; anticipate increased bleeding.

Oral Health Education
- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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clorazepate dipotassium (klor-AZE-uh-PATE DIE-poe-TASS-ee-uhm)
Tranxene-SD, Tranxene-SD Half Strength, Tranxene T-tab

Apo-Clorazepate, Novo-Clopate

Tranxene

Drug Class: Antianxiety; Benzodiazepine
DEA Schedule: Schedule IV

PHARMACOLOGY
Action
Potentiates action of GABA, an inhibitory neurotransmitter, resulting in increased neuronal inhibition and CNS depression, especially in limbic system and reticular formation.

Uses
Management of anxiety disorders; relief of acute alcohol withdrawal symptoms; adjunctive therapy in management of partial seizures.

Unlabeled Uses
Treatment of irritable bowel syndrome.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth; coated tongue.
CNS: Drowsiness; confusion; ataxia; dizziness; lethargy; fatigue; apathy; memory impairment; disorientation; anterograde amnesia; restlessness; nervousness; headache; slurred speech; loss of voice; stupor; coma; euphoria; irritability; vivid dreams; psychomotor retardation; paradoxical reactions (e.g., anger, hostility, mania, insomnia, muscle spasms); depression; tremor.
CVS: Bradycardia or tachycardia; hypotension or hypertension; palpitations.
GI: Constipation; diarrhea; nausea; anorexia; vomiting.
MISC: Dependence/withdrawal syndrome; blood dyscrasias (e.g., leukopenia, agranulocytosis, thrombocytopenia).

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- *When prescribed by DDS:* May produce sedation, interfere with eye-hand coordination, and the ability to operate mechanical equipment. Inform patient not to drive, sign important papers, or operate mechanical equipment.

Oral Health Education
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective, nontraumatic self-care.
- *When prescribed by DDS:* Warn patient not to drink alcoholic products while taking the drug.

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clotrimazole (kloe-TRIM-uh-zole)

Mycelex: Troches: 10 mg
Cruex, Desenex, Gyne-Lotrimin 3, Gyne-Lotrimin 3 Combination Pack, Gyne-Lotrimin 7, Lotrimin AF, Mycelex-7, Mycelex-7 Combination Pack
Canesten
Candimon, Lotrimin
Drug Class: Topical, antifungal

PHARMACOLOGY
Action
Inhibits yeast growth by increasing cell membrane permeability in susceptible fungi.

Uses
TOPICAL USE: Treatment of tinea pedis (athlete's foot), tinea cruris (jock itch), tinea corporis (ringworm), candidiasis, and tinea versicolor.

ORAL USE (TROCHE): Treatment of oropharyngeal candidiasis; prophylaxis of oropharyngeal candidiasis in specific groups of immunocompromised patients.
VAGINAL USE: Treatment of vulvovaginal candidiasis.

Contraindications
Standard considerations.

Usual Dosage
Oropharyngeal candidiasis
ADULTS AND CHILDREN OVER 3 YR: *PO:* One 10-mg troche (lozenge) dissolved slowly in the mouth 5 times/day for 14 days.
Prophylaxis
PO: One 10-mg troche dissolved slowly in the mouth tid.

Pharmacokinetics
ABSORP: After oral administration, the mean serum concentrations were about 4.98 and 3.23 mg/mL at 30 and 60 min, respectively. Minimally absorbed following topical administration.

DRUG INTERACTIONS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
GI: Nausea, vomiting (troche).

CLINICAL IMPLICATIONS
General
When prescribed by DDS:
- *Lactation:* Undetermined.
- Obtain patient history, including drug history and any known allergies. Note condition(s) that may predispose to recurrent infection (e.g., diabetes, concurrent antibiotic therapy, immunosuppression, HIV, AIDS) or liver disease (oral troche).
- Ensure that transaminases are determined periodically during prolonged therapy with oral troches, especially in patient with preexisting hepatic impairment.
- Monitor patient's response to therapy. Notify health care provider if symptoms do not improve or worsen.

Children
- *Oral (troches):* Safety not established in children younger than 3 yr.
- *Topical:* Safety and efficacy not established in children younger than 2 yr.
- *Recurrent infections:* May indicate underlying medical cause, including diabetes or HIV infection.

Pregnancy Risk Category: Category C (troches).

Oral Health Education
When prescribed by DDS:
- Explain name, dose, action, and potential side effects of drug.
- Instruct patient using OTC products to carefully read and follow the instructions that come with each package.
- Advise patient or caregiver that follow-up visits may be necessary and to keep appointments.

Oral Troche
- Teach patient proper technique for using oral troche as follows: slowly dissolve troche in mouth and retain saliva as long as possible before swallowing. Caution patient not to chew or swallow the troche.
- Advise patient to notify health care provider if any of the following occur: nausea, vomiting, abdominal cramps or discomfort, unpleasant mouth sensations, symptoms do not improve or worsen.

clozapine (KLOE-zuh-PEEN)

Clozapine, Clozaril, FazaClo

Rhoxal-clozapine

Clopsine, Leponex

Drug Class: Antipsychotic

PHARMACOLOGY

Action

Interferes with dopamine binding at D_1, D_2, D_3, and D_5 receptors in CNS; antagonizes adrenergic, cholinergic, histaminergic, and serotonergic neurotransmission.

Uses

Management of severely and chronically mentally ill schizophrenic patients who have not responded to or cannot tolerate standard antipsychotic drug treatment; to reduce risk of recurrent suicidal behavior in patients with schizophrenia or schizoaffective disorder who are judged to be at chronic risk for reexperiencing suicidal behavior (except orally disintegrating tablets).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Benzodiazepines: Syncope and respiratory arrest (mechanism unknown)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Salivation (31%); dry mouth (6%); salivary gland swelling, tongue numb/sore (1%).

CNS: Drowsiness/sedation (39%); dizziness/vertigo (19%); headache (7%); tremor, syncope (6%); disturbed sleep/nightmares, restlessness, hypokinesia/akinesia, agitation (4%); seizures, rigidity, akathisia, confusion (3%); fatigue, insomnia (2%); hyperkinesia, weakness, lethargy, ataxia, slurred speech, epileptiform movements/myoclonic jerks (high dose), depression, anxiety (1%); delirium; abnormal EEG; exacerbation of psychosis; myoclonus; paresthesia; mild cataplexy; status epilepticus.

CVS: Postural hypotension; syncope.

GI: Constipation (14%); nausea (5%); abdominal discomfort/heartburn (4%); nausea/vomiting (3%); diarrhea (2%); liver test abnormality, anorexia (1%); acute pancreatitis; dysphagia; fecal impaction; intestinal obstruction/paralytic ileus.

RESP: Dyspnea (1%); aspiration; pleural effusion.

MISC: Sweating (6%); fever (5%); muscle weakness; pain (back, neck, legs); muscle spasm; muscle pain/ache; hypersensitivity reactions; photosensitivity; vasculitis; myasthenic syndrome; rhabdomyolysis; creatine phosphokinase elevation; agranulocytosis (high risk).

CLINICAL IMPLICATIONS

General

- *General anesthesia:* Because of the CNS effects of clozapine, caution is advised in patients receiving general anesthesia.
- *Tardive dyskinesia:* This syndrome of potentially irreversible, involuntary dyskinetic movements has occurred with other antipsychotic agents. Incidence is highest among elderly, especially women.
- Due to the high risk for agranulocytosis, this drug is available only through a distribution system that ensures daily monitoring of WBC.
- Blood dyscrasias reported; anticipate increased bleeding, infection, and poor healing.
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.

- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Evaluate manual dexterity; consider need for power toothbrush.
- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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codeine phosphate (KOE-deen FOS-fate)

Codeine Contin, ratio-Codeine

Drug Class: Narcotic analgesic; Antitussive

DEA Schedule: Schedule II

PHARMACOLOGY

Action

Stimulates opiate receptors in the CNS; also causes respiratory depression, peripheral vasodilation, inhibition of intestinal peristalsis, stimulation of the chemoreceptors that cause vomiting, increased bladder tone, and suppression of cough reflex.

Uses

Relief of mild to moderate pain; cough suppression.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Bupivacaine: Possible respiratory depression (mechanism unknown)

- Use bupivacaine with caution.

ADVERSE EFFECTS

⚠ **ORAL:** Taste alterations; dry mouth; dysphagia.
CNS: Lightheadedness; dizziness; sedation; disorientation; incoordination; euphoria; delirium.
CVS: Bradycardia (common); tachycardia; postural hypotension; arrhythmia.
GI: Nausea; vomiting; constipation; abdominal pain; anorexia; biliary tract spasm.
RESP: Laryngospasm; depression of cough reflex; respiratory depression.
MISC: Tolerance; psychological and physical dependence with long-term use.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If oral pain requires additional analgesics, consider nonopioid products.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- *When prescribed by DDS:* Warn patient not to drive, sign important papers, or operate mechanical equipment.

colesevelam HCl (koe-leh-SEV-eh-lam HIGH-droe-KLOR-ide)

Welchol

Drug Class: Antihyperlipidemic, bile acid sequestrant; Antidiabetic

PHARMACOLOGY

Action

Increases removal of bile acids from the body by binding bile acids in the intestine, impeding their reabsorption. As the bile acid pool becomes depleted, the conversion of cholesterol to bile acids is increased, which decreases serum cholesterol. Reduces blood glucose (A_1C) in type 2 diabetes mellitus.

Uses

Adjunctive therapy to diet and exercise given alone or with an HMG-CoA reductase inhibitor for the reduction of elevated LDL cholesterol in patients with primary hypercholesterolemia (Fredrickson type IIa).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dental caries; bleeding; unpleasant taste; dysphagia.
GI: Constipation; dyspepsia; GI pain; nausea.
RESP: Pharyngitis.
CNS: Dizziness; lightheadedness; syncope.
CVS: Chest pain, tachycardia (infrequent).
MISC: Accidental injury; asthenia; myalgia.

CLINICAL IMPLICATIONS

General

- High LDL cholesterol concentration is the major cause of atherosclerosis, which leads to CAD (e.g., angina, MI); determine degree of CV health and ability to withstand stress of dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

colestipol HCl (koe-LESS-tih-pole HIGH-droe-KLOR-ide)

Colestid

Drug Class: Antihyperlipidemic, bile acid sequestrant

PHARMACOLOGY

Action

Increases removal of bile acids from body by forming insoluble complexes in the intestine, which are then excreted in feces. As body loses bile acids, it converts cholesterol from blood to bile acids, thus lowering serum cholesterol.

Uses

Reduction of cholesterol in patients with primary hypercholesterolemia who do not respond adequately to diet.

Unlabeled Uses
Treatment of digitalis toxicity.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Dysphagia; dental bleeding; dental caries; taste disturbance.
GI: Constipation; abdominal pain and cramping; intestinal bloating; flatulence; indigestion; heartburn; diarrhea; nausea; vomiting; bloody hemorrhoids and stools; esophageal obstruction.
CVS: Chest pain, tachycardia (infrequent).
MISC: Increased PT; ecchymosis.

CLINICAL IMPLICATIONS
General
- High LDL cholesterol concentration is the major cause of atherosclerosis, which leads to CAD (e.g., angina, MI); determine degree of CV health and ability to withstand stress of dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- If GI side effects occur, consider semisupine chair position.
- Increased PT, anemia are rarely reported; anticipate increased bleeding and poor healing.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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cortisone (CORE-tih-sone)
Synonym: cortisone acetate

Cortone Acetate

Drug Class: Corticosteroid

PHARMACOLOGY
Action
As short-acting glucocorticoid; depresses formation, release, and activity of endogenous mediators of inflammation; has some salt-retaining properties.

Uses
Treatment of primary or secondary adrenal cortex insufficiency; rheumatic disorders; collagen diseases; dermatological diseases; allergic states; allergic and inflammatory ophthalmic processes; respiratory diseases; hematological disorders; neoplastic diseases; edematous states (caused by nephrotic syndrome); GI diseases; multiple sclerosis; tuberculous meningitis; trichinosis with neurological or myocardial involvement.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
COX-1 inhibitors: Increased risk of peptic ulcer disease (additive)
- Avoid concurrent use.

ADVERSE EFFECTS
⚠ **ORAL:** Impaired wound healing; petechia; oral candidiasis.
CNS: Convulsions; increased intracranial pressure with papilledema; vertigo; headache; neuritis/paresthesias; psychosis; fatigue; insomnia.

CVS: Arrhythmia; syncope; hypertension.
GI: Pancreatitis; abdominal distention; ulcerative esophagitis; nausea; vomiting; increased appetite and weight gain; peptic ulcer; small bowel and large bowel perforation, especially in inflammatory bowel disease.
MISC: Musculoskeletal effects (e.g., muscle weakness, myopathy, tendon rupture, osteoporosis, aseptic necrosis of femoral and humeral heads, spontaneous fractures); anaphylactoid reactions; aggravation or masking of infections; malaise; adrenal suppression.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Be aware that signs of bacterial oral infection may be masked and anticipate oral candidiasis.
- Monitor blood pressure and pulse.
- Anticipate oral candidiasis when steroids are used.
- Anticipate addisonian or cushingoid complications affecting the head and neck area.
- The anticipated perioperative physiological stress in patients undergoing dental care (minor surgical stress) under local anesthesia should take only their usual daily glucocorticoid dose before dental intervention. No supplementation is justified.

Oral Health Education

- *Topical:* If prescribed by DDS, ensure patient understands how to use product, amount to apply, method of application, and signs of adverse effects.

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cromolyn sodium (KROE-moe-lin SO-dee-uhm)

Synonym: disodium cromoglycate

Crolom, Gastrocrom, Intal, NasalCrom

Apo-Cromolyn Nasal Spray, Apo-Cromolyn Sterules, Nalcrom, Nu-Cromolyn

Drug Class: Respiratory inhalant

PHARMACOLOGY

Action

Stabilizes mast cells, which release histamine and other mediators of allergic reactions.

Uses

INHALATION: Prophylaxis of severe bronchial asthma; prevention of exercise-induced asthma; prevention of acute bronchospasm induced by environmental pollutants and known antigens.
NASAL SOLUTION: Prevention and treatment of allergic rhinitis.
ORAL: Treatment of mastocytosis.
OPHTHALMIC: Treatment of vernal keratoconjunctivitis, vernal conjunctivitis, and vernal keratitis.

Unlabeled Uses

ORAL: Symptoms of food allergies; eczema; dermatitis; ulceration; urticaria pigmentosa; chronic urticaria; hay fever; and postexercise bronchospasm.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, throat; taste disturbance (common); stomatitis.
CNS: Dizziness; headache.
CVS: Tachycardia.

GI: Nausea; substernal burning; diarrhea (oral form).
RESP: Cough; wheezing; bronchospasm.
MISC: Joint pain and swelling.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse rate, respiratory rate, and function); uncontrolled disease characterized by wheezing and coughing.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Be aware that sulfites in local anesthetic with a vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Inhalants can dry oral mucosa; anticipate candidiasis and increased calculus, plaque levels, and caries activity.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Instruct to ensure that bronchodilator inhaler is present at each dental appointment.

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cyclobenzaprine HCl (SIGH-kloe-BEN-zuh-preen HIGH-droe-KLOR-ide)

Flexeril

Apo-Cyclobenzaprine, Gen-Cyclobenzaprine, Novo-Cycloprine, Nu-Cyclobenzaprine, ratio-Cyclobenzaprine

Drug Class: Skeletal muscle relaxant, centrally acting

PHARMACOLOGY

Action

Relieves skeletal muscle spasms of local origin without interfering with muscle function by acting within CNS at brainstem. Structurally and pharmacologically related to tricyclic antidepressants.

Uses

Relief of muscle spasms associated with acute painful musculoskeletal conditions.

Unlabeled Uses

Treatment of fibrositis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (27%); unpleasant taste (3%); tongue swelling, discoloration (<1%), thirst.
CNS: Drowsiness; dizziness; fatigue; asthenia; headache; nervousness; convulsions; confusion.
CVS: Tachycardia, hypotension, palpitations, syncope (<1%); arrhythmia.
MISC: Photosensitization; extrapyramidal behaviors.
GI: Nausea; constipation; dyspepsia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.

- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor blood pressure and pulse.
- If GI side effects occur, consider semisupine chair position.
- *For back pain:* Consider semisupine chair position for patient comfort.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

cycloserine (sigh-kloe-SER-een)

Seromycin Pulvules

Drug Class: Anti-infective; Antitubercular

PHARMACOLOGY

Action

Inhibits cell wall synthesis in susceptible strains of certain microorganisms.

Uses

Treatment of active pulmonary and extrapulmonary tuberculosis when organisms are susceptible (after failure of adequate treatment with primary medications); treatment of UTIs caused by susceptible bacteria when conventional therapy has failed; treatment of Gaucher disease.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Convulsions; drowsiness; somnolence; headache; tremor; dysarthria; vertigo; confusion; loss of memory; psychoses with suicidal tendencies, behavior changes, hyperirritability, aggression, paresis; hyperreflexia; paresthesias; major and minor clonic seizures; coma; dizziness.

CVS: Arrhythmia.

MISC: Tremors.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken (prevention or treatment). Consider implications of condition on dental treatment.
- Complete medical consult to ensure noninfectious state exists before providing dental treatment.
- *For dental emergencies:* Follow special precautions to minimize disease transmission (particulate respirators) or refer patient to a hospital-based dental facility.
- Question patient about CNS side effects and use of alcoholic beverages; anticipate seizure activity if alcohol is used.

cyclosporine (SIGH-kloe-spore-EEN)

Synonym: cyclosporin A

Gengraf, Neoral, Restasis, Sandimmune

Rhoxal-cyclosporine, Sandimmune

Consupren

Drug Class: Immunosuppressant

PHARMACOLOGY

Action

Suppresses cell-mediated immune reactions and some humoral immunity, but exact mechanism is not known.

Uses

Prophylaxis of organ rejection in kidney, liver, and heart allogeneic transplants in conjunction with adrenal corticosteroid therapy; treatment of chronic rejection in patients previously treated with other immunosuppressive agents; increase tear production in patients whose tear production is presumed to be suppressed because of ocular inflammation associated with keratoconjunctivitis sicca (ophthalmic emulsion).

GENGRAF, NEORAL: Treatment of severe active rheumatoid arthritis (RA) where disease is not adequately responsive to methotrexate; treatment of adult, nonimmunocompromised patients with severe, recalcitrant, plaque psoriasis who have failed to respond to a least one systemic therapy or in patients for whom other systemic therapies are contraindicated or cannot be tolerated.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole, ketoconazole, or itraconazole: Renal toxicity (decreased cyclosporine metabolism)

- Avoid concurrent use.

Metronidazole: Possible cyclosporine toxicity (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Gingival hyperplasia (16%); gingivitis, stomatitis, glossitis, salivary gland enlargement, tongue disorder (nonspecified), tooth disorder (nonspecified) (3%); gingival bleeding (1%); herpes simplex; candidiasis.

CNS: Tremor (55%); headache (15%); convulsions (5%); confusion, depression, dizziness, insomnia, migraine, paresthesia (≥3%); anxiety, decreased or increased libido, nervousness, emotional lability, hypoesthesia, vertigo, impaired concentration, neuropathy, paranoia, somnolence, asthenia (≤3%); encephalopathy.

CVS: Hypertension; chest pain.

GI: Nausea, vomiting (10%); diarrhea (8%); abdominal discomfort (≤7%); anorexia, dyspepsia, flatulence, rectal hemorrhage (≥3%); dysphagia, enanthema, eructation, esophagitis, gastric ulcer, gastroenteritis, gastritis, peptic ulcer (≤3%); hiccups (≤2%); constipation (≥1%).

RESP: Sinusitis (7%); bronchitis, coughing, dyspnea, respiratory tract infection, pneumonia (≥3%); abnormal chest sounds, tonsillitis, bronchospasm (≤3%).

MISC: Cramps (4%); accidental trauma, fever, flu-like symptoms, pain, purpura (≥3%); abscess, bacterial infection, cellulitis, fungal infection, herpes zoster, moniliasis, viral infection, tumor, malaise (≤3%); allergic reaction, edema, fever (≤2%); increased appetite (≥1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- Be aware that signs of bacterial oral infection may be masked and anticipate oral candidiasis.
- Immunosuppressant therapy reduces host response to infection.
- Monitor vital signs.
- If GI or respiratory side effects occur, consider semisupine chair position.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- Encourage daily plaque control procedures for effective self-care.

daclizumab (da-KLIZ-uh-mab)

Zenapax

Drug Class: Immunosuppressive

PHARMACOLOGY

Action

Binds with high-affinity to the Tac subunit of the high-affinity interleukin-2 (IL-2) complex and inhibits IL-2 binding, thereby impairing the response of the immune system to antigenic challenges.

Uses

Prophylaxis of acute organ rejection in patients receiving renal transplants.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Impaired wound healing; increased bleeding.

CNS: Tremor, headache, dizziness, insomnia (≥5%); depression, anxiety (2% to <5%).

CVS: Hypertension or hypotension; tachycardia; bleeding.

GI: Constipation, nausea, diarrhea, vomiting, abdominal pain, pyrosis, dyspepsia, abdominal distention, epigastric pain (≥5%); flatulence, gastritis, hemorrhoids (2% to <5%).

RESP: Dyspnea, pulmonary edema, coughing (≥5%); atelectasis, congestion, hypoxia, rales, abnormal breath sounds, pleural effusion (2% to <5%).

MISC: Posttraumatic pain, chest pain, fever, pain, fatigue (≥5%); shivering, generalized weakness, prickly sensation (2% to <5%). The safety of daclizumab was determined in patients receiving concomitant cyclosporine and corticosteroids.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine physical status and influence on dental treatment.
- Monitor vital signs.
- If GI or respiratory side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

dalteparin sodium (dal-TE-pa-rin SO-dee-um)

Fragmin

Drug Class: Low molecular weight heparin (LMWH)

PHARMACOLOGY

Action

Inhibits reactions that lead to clotting.

Uses

Prophylaxis of ischemic complications in unstable angina and non–Q-wave myocardial infarction (MI) in patients on aspirin therapy; prophylaxis of deep vein thrombosis (DVT), which may lead to pulmonary embolism (PE), in patients undergoing hip replacement surgery, in patients undergoing abdominal surgery who are at risk for thromboembolic complications, or in patients who are at risk of thromboembolic complications due to severely restricted mobility during acute illness; extended treatment of symptomatic venous

thromboembolism (VTE) (proximal DVT and/or PE) to reduce recurrence of VTE in patients with cancer.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

NSAIDs: Increased risk of bleeding (additive)
- Avoid concurrent use.

ADVERSE EFFECTS

CVS: Thrombocytopenia.

MISC: Allergic reactions, including pruritus, rash, fever, injection-site reaction, or bullous eruption; anaphylactoid reactions.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine partial thromboplastin time (PTT) before initiating procedures that may result in significant bleeding.
- If uncontrolled bleeding develops, use hemostatic agents and positive pressure to induce hemostasis. Do not dismiss patient until bleeding is controlled.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Monitor frequently to ensure adequate clotting during treatment that involves bleeding.

Oral Health Education

- Encourage patient to follow daily, nontraumatic plaque control procedures for effective self-care.

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dantrolene sodium (dan-troe-LEEN SO-dee-uhm)

Dantrium, Dantrium Intravenous

Drug Class: Skeletal muscle relaxant

PHARMACOLOGY

Action

Affects contraction of muscle at site beyond myoneural junction and directly on muscle itself. Affects CNS, causing drowsiness, dizziness, and generalized weakness.

Uses

Control of spasticity associated with spinal cord injury, stroke, cerebral palsy, or multiple sclerosis; prophylaxis, treatment, and postcrisis therapy of malignant hyperthermia.

Unlabeled Uses

Management of exercise-induced muscle pain, neuroleptic malignant syndrome, heat stroke.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

Caused by oral administration except where otherwise indicated.
CVS: Tachycardia; erratic BP; phlebitis.

CNS: Drowsiness; dizziness; weakness; general malaise; fatigue; speech disturbances; seizures; headache; lightheadedness; insomnia, mental depression, or confusion; increased nervousness.

GI: Diarrhea; constipation; bleeding; anorexia; dysphagia; gastric irritation; abdominal cramps.

RESP: Pleural effusion with pericarditis; pulmonary edema (IV).

MISC: Myalgia; backache; chills; fever; feeling of suffocation; excessive tearing; thrombophlebitis (IV).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

dapsone (DAP-sone)

Aczone: Gel: 5%
Dapsone: Tablets: 25, 100 mg

Dapsoderm-X

Drug Class: Anti-infective; Leprostatic

PHARMACOLOGY

Action

Mechanism of action is unknown; however, dapsone is bactericidal and bacteriostatic against *Mycobacterium leprae*.

Uses

TABLETS: Treatment of dermatitis herpetiformis; leprosy.
GEL: Acne vulgaris.

DRUG INTERACTIONS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CVS: Tachycardia.

CNS: Peripheral neuropathy; motor loss; muscle weakness; insomnia; headache; psychosis.

GI: Nausea; vomiting; abdominal pains; pancreatitis; vertigo.

RESP: Pulmonary eosinophilia.

MISC: Fever; phototoxicity; hypoalbuminemia; lupus erythematosus; infectious mononucleosis–like syndrome; hemolytic anemia (high doses), methemoglobinemia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs.
- Blood dyscrasias rarely reported; anticipate increased infection and poor healing.

Pregnancy Risk Category: Category C.

Oral Health Education

When prescribed by DDS:

- Explain name, dose, action, and potential side effects of drug.
- Review dosing schedule and prescribed length of therapy with patient.
- Advise patient that medication may be started at a low dose and then gradually increased to provide maximum benefit.
- Instruct patient to continue to take other prescribed medications while taking dapsone.
- Emphasize to patient that treatment will be lengthy and that the entire course of treatment must be completed to avoid relapse or development of resistance.

- Advise patient to take each dose with food if GI upset occurs.
- Instruct patient to stop using and notify health care provider immediately if any of the following symptoms occur: skin rash, sore throat, fever, paleness, purple discoloration of skin, yellowing of skin or eyes, muscle weakness.
- Advise women to notify health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Advise patient that drug may cause blurred vision or dizziness and to use caution while driving or performing other tasks requiring mental alertness until tolerance is determined.
- Instruct patient to not take any prescription or OTC medications or dietary supplements unless advised by health care provider.
- Advise patient that follow-up visits and laboratory tests will be required to monitor therapy and to keep appointments.

darbepoetin alfa (dar-be-POE-e-tin AL-fa)

Aranesp

Drug Class: Recombinant human erythropoietin

PHARMACOLOGY

Action

Stimulates red blood cell production.

Uses

Treatment of anemia associated with chronic renal failure, whether or not the patient is on dialysis; treatment of anemia in patients with nonmyeloid malignancies in whom anemia is caused by coadministered chemotherapy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CVS: Hypertension (23%); hypotension (22%); cardiac arrhythmias/cardiac arrest (10%); angina pectoris/cardiac chest pain, thrombosis vascular access (8%); CHF, thrombosis (6%); acute MI (2%); pulmonary embolism, stroke, transient ischemic attack (1%).

CNS: Fatigue (33%); headache (16%); dizziness (14%); asthenia (5%); seizure (1%).

GI: Diarrhea (22%); constipation (18%); vomiting (15%); nausea (14%); abdominal pain (12%).

RESP: Upper respiratory tract infection (14%); dyspnea (12%); cough (10%); bronchitis (6%).

MISC: Infection (27%); edema (21%); fever (19%); peripheral edema (11%); death (7%); access hemorrhage, access infection, chest pain, influenza-like symptoms (6%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Malignancy*: Seek medical consultation to determine WBC and platelet count before invasive dental procedures, including periodontal debridement.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm, respiration) at each appointment.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.
- Recommend frequent maintenance prophylaxis when immunosuppression is evident.
- Teach patient importance of updating health and drug history if physician makes any changes in evaluation/drug regimens.

darifenacin (dar-ih-FEN-ah-sin)

Enablex

Drug Class: Anticholinergic

PHARMACOLOGY

Action

Competitive muscarinic receptor antagonist.

Uses

Treatment of overactive bladder with symptoms of urge urinary incontinence, urgency, and frequency.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Clarithromycin: Possible increased darifenacin toxicity (decreased metabolism)

- Avoid concurrent use.

Ketoconazole or itraconazole: Possible increased darifenacin toxicity (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (20% to 35%).

CVS: Hypertension (≥1%).

CNS: Headache (7%); asthenia (3%); dizziness (2%).

GI: Constipation (21%); dyspepsia (8%); abdominal pain, nausea (4%); diarrhea (2%); vomiting (≥1%).

RESP: Bronchitis, sinusitis (≥1%).

MISC: Accidental injury, flu-like syndrome (3%); pain, peripheral edema (≥1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

darunavir ethanolate (dar-UE-na-vir ETH-a-NOLE-ate)

Prezista

Drug Class: Protease inhibitor, antiretroviral

PHARMACOLOGY

Action

Inhibits HIV-1 protease, the enzyme required to form functional proteins in HIV-infected cells.

Uses

Treatment of HIV infection in combination with ritonavir 100 mg and other antiretroviral agents.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (less than 2%).

CVS: Hypertension, MI, tachycardia (less than 2%).

CNS: Headache (4%); altered mood, anxiety, asthenia, confusional state, disorientation, fatigue, hypoesthesia, irritability, memory impairment, nightmares, paresthesia, peripheral neuropathy, pyrexia, somnolence, transient ischemic attack, vertigo (less than 2%).

GI: Diarrhea (3%); abdominal pain, constipation, vomiting (2%); abdominal distension, dyspepsia, flatulence, nausea (less than 2%).

RESP: Cough, dyspnea, hiccups (less than 2%).

MISC: Folliculitis, hyperthermia, peripheral edema (less than 2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function.
- If GI side effects occur, consider semisupine chair position.
- Anticipate oral candidiasis when HIV disease is reported.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care because HIV infection reduces host resistance.
- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.

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delavirdine mesylate (dell-ah-VER-deen MEH-sih-late)

Rescriptor

Drug Class: Antiretroviral, non-nucleoside reverse transcriptase inhibitor

PHARMACOLOGY

Action

Inhibits replication of HIV-1 infection by interfering with DNA synthesis.

Uses

Treatment of HIV-1 infection in combination with appropriate antiretroviral agents when therapy is warranted.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole: Possible delavirdine toxicity (decreased metabolism)

- Avoid concurrent use.

Benzodiazepines: Increased benzodiazepine toxicity (decreased metabolism)

- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Lip edema; aphthous stomatitis; dry mouth; dysphagia; gingivitis; gingival bleeding; gagging; increased salivation; thirst; stomatitis; sialadenitis; tongue edema; taste perversion.

CNS: Lethargy; headache; migraine; abnormal coordination; agitation; amnesia; anxiety; change in dreams; cognitive impairment; confusion; depression; disorientation; dizziness; emotional lability; hallucination; hyperesthesia; impaired concentration; insomnia; manic symptoms; nervousness; neuropathy; nightmares; paranoid symptoms; paresthesia; restlessness; somnolence; tingling; tremor; vertigo.

CVS: Bradycardia or tachycardia; syncope; postural hypotension; palpitations.

GI: Nausea; diarrhea; vomiting; abdominal cramps; distention; pain; anorexia; bloody stool; colitis; constipation; decreased appetite; diverticulitis; duodenitis; dyspepsia; enteritis; fecal incontinence; flatulence; gastritis; gastroesophageal reflux; GI bleeding; increased appetite; pancreatitis; rectal disorder.

RESP: URI; bronchitis; chest congestion; cough; dyspnea.

MISC: Asthenia; back pain; chest pain; flank pain; chills; edema; fever; flu-like syndrome; lethargy; weakness; malaise; neck rigidity; sebaceous and epidermal cysts; muscle cramps; paralysis; weight increase or decrease; arthralgia; arthritis; bone disorder; bone pain; myalgia; tendon disorder; tenosynovitis; tetany; photophobia; blood dyscrasias (e.g., thrombocytopenia, leukopenia, anemia, others).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- Anticipate oral candidiasis when HIV disease is reported.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.
- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values improve above this level.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care since HIV infection reduces host resistance.
- Recommend frequent maintenance prophylaxis when immunosuppression is evident.

desipramine HCl (dess-IPP-ruh-meen HIGH-droe-KLOR-ide)

Norpramin: Tablets: 10, 25, 50, 75, 100, 150 mg

Apo-Desipramine, Novo-Desipramine, Nu-Desipramine, PMS-Desipramine, ratio-Desipramine

Drug Class: Tricyclic antidepressant

PHARMACOLOGY

Action

Inhibits reuptake of norepinephrine and serotonin in CNS.

Uses

Relief of symptoms of depression.

Unlabeled Uses

Facilitation of cocaine withdrawal; treatment of panic and eating disorders (e.g., bulimia nervosa).

Contraindications

Hypersensitivity to any tricyclic antidepressant. Not to be given in combination with or within 14 days of treatment with an MAO inhibitor; cross-sensitivity may occur across the dibenzazepines. Do not give during acute recovery phases of MI.

Usual Dosage

ADULTS: *PO:* 100 to 300 mg/day. May be given in divided doses or once daily at bedtime.
ELDERLY AND ADOLESCENT PATIENTS: *PO:* 25 to 150 mg/day.

Pharmacokinetics

ABSORP: Rapidly absorbed.
METAB: Metabolized in the liver.
EXCRET: Approximately 70% excreted in the urine; $t_{1/2}$ is 12 to 24 hr.
ONSET: 2 to 5 days.
PEAK: 2 to 3 wk.
SPECIAL POP: *Elderly:* Rate of metabolism is slower. Dosage adjustment recommended.

DRUG INTERACTIONS

Tramadol: Increased risk of seizures (additive)
- Avoid concurrent use.

Ibuprofen: Possible desipramine toxicity (mechanism unknown)
- Avoid concurrent use.

Sympathomimetic amines: Hypertension and hypertensive crisis (inhibition of epinephrine uptake)
- Use local anesthetic agents containing a vasoconstrictor with caution.
- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; aphthous stomatitis; stomatitis; taste disturbance; tardive dyskinesia.
CVS: Orthostatic hypotension; hypertension; tachycardia; palpitations; arrhythmias; ECG changes; hypertensive episodes during surgery; stroke; heart block; CHF.
CNS: Confusion; disturbed concentration; hallucinations; delusions; nervousness; numbness; tremors; extrapyramidal symptoms (pseudoparkinsonism, movement disorders, akathisia); restlessness; agitation; panic; insomnia; nightmares; mania; exacerbation of psychosis; drowsiness; dizziness; weakness; fatigue; emotional lability; seizures.
GI: Nausea; vomiting; anorexia; GI distress; diarrhea; flatulence; constipation.
RESP: Pharyngitis; rhinitis; sinusitis; bronchospasm; cough.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Extrapyramidal behaviors can complicate performance of oral procedures. If conditions present, consult with MD to consider medication changes.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.

When prescribed by DDS:
- *Lactation:* Excreted in breast milk.

- *Children:* Not recommended in children younger than 12 yr.
- *Special Risk:* Use drug with caution in patients with history of seizures, urinary retention, urethral or ureteral spasm, angle-closure glaucoma, increased intraocular pressure, or cardiovascular disorders; in patients receiving thyroid medication and in patients who have hepatic or renal impairment, schizophrenia, or paranoia.
- *Overdosage:* Confusion, agitation, hallucinations, seizures, status epilepticus, clonus, choreoathetosis, hyperactive reflexes, positive Babinski signs, coma, cardiac arrhythmias, renal failure, flushing, dry mouth, dilated pupils, hyperpyrexia.

Pregnancy Risk Category: Category C.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective, nontraumatic self-care.

When prescribed by DDS:

- Warn patient of risk of seizure.
- Instruct patient to keep weekly record of weight.
- Teach patient how to take BP and heart rate.
- Explain missed medication procedure: 2 hr, wait until next scheduled dose. Do not double doses.
- Teach proper techniques for oral hygiene to help prevent/treat dry mucous membranes.
- Tell patient to increase fluid intake.
- Inform male patients of possible sexual dysfunction.
- Tell patient of possible difficulty urinating.
- Instruct patient to avoid intake of alcoholic beverages or other CNS depressants.
- Advise patient that drug may cause drowsiness and to use caution while driving or performing other tasks requiring mental alertness.
- Advise patient to complete full course of therapy; may take 4 to 6 wk to see full benefits.

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desloratadine (dess-lore-AT-ah-deen)

Clarinex, Clarinex RediTabs

Aerius

Drug Class: Antihistamine

PHARMACOLOGY

Action

Long-acting histamine antagonist with selective H_1-receptor histamine antagonist activity.

Uses

Relief of nasal and nonnasal symptoms of seasonal and perennial allergic rhinitis; in chronic idiopathic urticaria, for relief of symptoms of pruritus and reduction in number and size of hives.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole: Possible desloratadine toxicity (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, nose, throat; (nasal spray) bitter taste.

CNS: Headache (14%); fatigue (5%); dizziness (4%); somnolence (2%).

CVS: Tachycardia.

GI: Nausea (5%); dyspepsia (3%).

MISC: Myalgia (3%); photosensitivity; hypersensitivity (e.g., rash, pruritus, urticaria, edema, dyspnea, anaphylaxis).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider semisupine chair position to control effects of postnasal drainage.
- Be aware that patients with multiple allergies are at increased risk for allergy to dental drugs.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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desonide (DESS-oh-nide)

DesOwen

Desocort

DesOwen

Drug Class: Corticosteroid, topical

PHARMACOLOGY

Action

Low-potency topical corticosteroid that depresses formation, release, and activity of endogenous mediators of inflammation including prostaglandins, kinins, histamine, liposomal enzymes, and complement system; modifies body's immune response.

Uses

Relief of inflammatory and pruritic manifestations of corticosteroid-responsive dermatoses.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Burning; itching; erythema; perioral dermatitis.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Because of the anticipated perioperative physiological stress in undergoing dental care (minor surgical stress) under local anesthesia, patients should take only their usual daily glucocorticoid dose before dental intervention. No supplementation is justified.
- Anticipate oral candidiasis when steroids are used.

Oral Health Education

- *When prescribed by DDS:* Ensure patient understands how to use product, amount to apply, method of application, and signs of adverse effects.

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desoximetasone (dess-OX-ee-MET-ah-sone)

Topicort, Topicort LP

Desoxi

Drug Class: Corticosteroid, topical

PHARMACOLOGY

Action

High-potency topical corticosteroid that depresses formation, release, and activity of endogenous mediators of inflammation including prostaglandins, kinins, histamine, liposomal enzymes, and complement system; modifies the body's immune response.

Uses
Relief of inflammation and pruritic manifestations of corticosteroid-responsive dermatoses.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Burning; itching; erythema; perioral dermatitis.

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- The anticipated perioperative physiological stress in patients undergoing dental care (minor surgical stress) under local anesthesia should take only their usual daily glucocorticoid dose before dental intervention. No supplementation is justified.
- Anticipate oral candidiasis when steroids are used.

Oral Health Education
- *When prescribed by DDS:* Ensure patient understands how to use product, amount to apply, method of application, and signs of adverse effects.

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dexamethasone (DEX-uh-METH-uh-sone)
(dexamethasone acetate, dexamethasone sodium phosphate)

Aeroseb-Dex: Aerosol: 0.01%
Dalalone DP: Injection: 16 mg/mL suspension
Dalalone LA: Injection: 8 mg/mL suspension
Decadron: Tablets: 0.5, 0.75, 4 mg; Elixir: 0.5 mg/5 mL
Dalalone, Decaject, Dexasone, Dexone: Injection: 4 mg/mL
Decadron-LA, Decaject-L.A., Dexasone-L.A., Dexone LA: Injection: 8-mg/mL suspension
Decadron Phosphate: Cream: 0.1%; Injection: 4 mg/mL, 24 mg/mL; Ointment: 0.05%; Solution: 0.1%
Decaspray: Aerosol: 0.04%
Dexameth, Dexone: Tablets: 0.5, 0.75, 1.5, 4 mg
Hexadrol: Tablets: 1.5 mg, 4 mg, Therapeutic Pack; Elixir: 0.5 mg/5 mL
Maxidex: Suspension: 0.1%
Hexadrol Phosphate: Injection: 4 mg/mL, 10 mg/mL, 20 mg/mL

Dexair, PMS-Dexamethasone, ratio-Dexamethasone

Alin, Alin Depot, Decadronal, Decorex, Dexagrin, Dibasona, Indarzona

Drug Class: Corticosteroid

PHARMACOLOGY
Action
Synthetic long-acting glucocorticoid that depresses formation, release, and activity of endogenous mediators of inflammation including prostaglandins, kinins, histamine, liposomal enzymes, and complement system. Also modifies body's immune response.

Uses
Testing of adrenal cortical hyperfunction; management of primary or secondary adrenal cortex insufficiency, rheumatic disorders, collagen diseases, dermatological diseases, allergic states, allergic and inflammatory ophthalmic processes, respiratory diseases, hematological disorders, neoplastic diseases, cerebral edema associated with primary or metastatic brain tumor, craniotomy or head injury, edematous states (caused by nephrotic syndrome), GI

diseases, multiple sclerosis, tuberculous meningitis, trichinosis with neurological or myocardial involvement.
INTRALESIONAL ADMINISTRATION: Treatment for keloids, psoriatic plaques, discoid lupus erythematosus, alopecia areata.
INTRA-ARTICULAR OR SOFT TISSUE ADMINISTRATION: Short-term adjunctive treatment synovitis of osteoarthritis, rheumatoid arthritis, acute gouty arthritis, posttraumatic osteoarthritis.
TOPICAL: Treatment of inflammatory and pruritic manifestations of corticosteroid-responsive dermatoses.
ORAL INHALATION: Treatment of corticosteroid-responsive and bronchial asthma bronchospastic states.
INTRANASAL: Treatment of allergic or inflammatory nasal conditions, nasal polyps (excluding those originating within sinuses).
OPHTHALMIC: Treatment of steroid-responsive inflammatory conditions of palpebral and bulbar conjunctiva, lid, cornea, and anterior segment of globe.

Unlabeled Uses

Treatment of acute mountain sickness, bacterial meningitis, bronchopulmonary dysplasia in preterm infants; diagnosis of depression; treatment of hirsutism; and use as antiemetic.

Contraindications

Systemic fungal infections; IM use in idiopathic thrombocytopenic purpura; administration of live virus vaccines; topical monotherapy in primary bacterial infections; intranasal use in untreated localized infections involving nasal mucosa; ophthalmic use in acute superficial herpes simplex keratitis, fungal diseases of ocular structures, vaccinia, varicella, and ocular tuberculosis.

Usual Dosage

All dosages shown are for adults.

DEXAMETHASONE

INITIAL DOSE: *PO:* 0.75 to 9 mg/day.
TOPICAL: Apply sparingly to affected areas qid.

Pharmacokinetics

METAB: Metabolized in the liver by CYP3A4.
EXCRET: The $t_{1/2}$ is 1.8 to 3.5 hr.
ONSET: Rapid (injection).
DURATION: Short (injection).

DRUG INTERACTIONS

Ketoconazole or itraconazole: Possible dexamethasone toxicity (decreased metabolism)
- Avoid concurrent use.

Aspirin: Decreased aspirin effect (mechanism unknown)
- Monitor clinical status.

Midazolam: Possible decreased midazolam effect (increased metabolism)
- Monitor clinical status.

COX-1 inhibitors: Increased risk of peptic ulcer disease (additive)
- Avoid concurrent use.

ADVERSE EFFECTS

CVS: Impaired wound healing; ulcerative esophagitis.
CVS: Thromboembolism or fat embolism; thrombophlebitis; necrotizing angiitis; cardiac arrhythmias or ECG changes; syncopal episodes; hypertension; myocardial rupture; CHF.
CNS: Convulsions; increased intracranial pressure with papilledema (pseudotumor cerebri); vertigo; headache; neuritis; paresthesias; psychosis.
GI: Pancreatitis; abdominal distension; ulcerative esophagitis; nausea; vomiting; increased appetite and weight gain; peptic ulcer with perforation and hemorrhage; bowel perforation.
RESP: Wheezing (oral inhalation).

MISC: Musculoskeletal effects (e.g., weakness, myopathy, muscle mass loss, osteoporosis, spontaneous fractures); endocrine abnormalities (e.g., menstrual irregularities, cushingoid state, growth suppression in children, sweating, decreased carbohydrate tolerance, hyperglycemia, glycosuria, increased insulin or sulfonylurea requirements in patients with diabetes, anaphylactoid or hypersensitivity reactions); aggravation or masking of infections; malaise; leukocytosis; fatigue; insomnia. Osteonecrosis; tendon rupture; infection; skin atrophy; postinjection flare; hypersensitivity; facial flushing (intra-articular). Topical use may theoretically produce adverse reactions seen with systemic use because of absorption.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Be aware that signs of bacterial oral infection may be masked and anticipate oral candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Prophylactic antibiotics may be indicated to prevent infection if surgery or periodontal debridement is planned.
- Due to the anticipated perioperative physiological stress, patients undergoing dental care (minor surgical stress) under local anesthesia should take only their usual daily glucocorticoid dose before dental intervention. No supplementation is justified.

When used or prescribed by DDS:

- *Lactation:* Excreted in breast milk.
- *Children:* May be more susceptible to adverse reactions from topical use than are adults. Observe growth and development of infants and children on prolonged therapy.
- *Elderly:* May require lower doses.
- *Renal failure:* Use cautiously; monitor renal function.
- *Sulfite sensitivity:* Some products may contain sodium bisulfite, which may cause allergic-type reactions in some individuals.
- *Adrenal suppression:* Prolonged therapy may lead to hypothalamic-pituitary-adrenal suppression.
- *Fluid and electrolyte balance:* Can cause elevated BP, salt and water retention, and increased potassium and calcium excretion. Dietary salt restriction and potassium supplementation may be needed.
- *Hepatitis:* May be harmful in chronic active hepatitis positive for hepatitis B surface antigen.
- *Infections:* May mask signs of infection. May decrease host-defense mechanisms to prevent dissemination of infection.
- *Ocular effects:* Use systemically with caution in ocular herpes simplex because of possible corneal perforation.
- *Ophthalmic use:* Prolonged use may result in glaucoma or other complications.
- *Peptic ulcer:* May contribute to peptic ulceration, especially in large doses.
- *Stress:* Increased dosage of rapidly acting corticosteroid may be needed before, during, and after stressful situations.
- *Withdrawal:* Abrupt discontinuation may result in adrenal insufficiency. Discontinue gradually.
- *Overdosage:* Fever, myalgia, arthralgia, malaise, anorexia, nausea, skin desquamation, orthostatic hypotension, dizziness, fainting, dyspnea, hypoglycemia (acute overdose); moon face, central obesity, striae, hirsutism, acne, ecchymoses, hypertension, osteoporosis, myopathy, sexual dysfunction, diabetes, hyperlipidemia, peptic ulcer, infection, electrolyte and fluid imbalance (chronic cushingoid changes).

Pregnancy Risk Category:

Pregnancy category undetermined (systemic use); Category C (topical uses).

Oral Health Education

When used or prescribed by DDS:

- Caution patient that stopping drug abruptly is dangerous and may cause adrenal insufficiency.
- Explain rationale for tapering off medication when that time comes.

- Teach patient or family procedures for correctly administering specific form of drug (e.g., ophthalmic, inhalation, topical).
- Caution patient against receiving immunizations while drug is being taken.
- Advise patient on long-term therapy to carry medication identification card or to wear bracelet. In case of emergency, this information is important for treatment.
- Instruct patient to avoid people with infections, particularly respiratory.
- If patient is receiving intranasal form, instruct patient to clear nasal passages of secretions before administering drug.
- If topical, advise patient not to use occlusive dressings such as plastic wrap ~12 hr a day. Occlusion may lead to sweat retention and to bacterial and fungal infections. Remember that tight-fitting plastic diapers on infants may also be occlusive.
- Teach patient to take oral forms with meals or snacks if GI irritation occurs.
- Review guidelines for missed doses of particular product with patient.
- Teach patient on long-term therapy how to keep a weight record.
- Instruct patient to inform other health care providers if taking a steroid.
- Review signs of infection and remind patient that fever, swelling, and redness may be masked in infection.
- Review possible side effects of dexamethasone with patient and to report these to health care provider.

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dexmethylphenidate HCl (DEX-meth-ill-FEN-ih-date HIGH-droe-KLOR-ide)

Focalin, Focalin XR

Drug Class: CNS stimulant, psychotherapeutic

DEA Schedule: Schedule II

PHARMACOLOGY

Action

Exact mechanism of action is unknown; however, may block the reuptake of norepinephrine and dopamine into presynaptic neurons and increase release of these monoamines into extraneuronal spaces.

Uses

Treatment of attention deficit hyperactivity disorder (ADHD).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Pilocarpine: Increased myopia (mechanism unknown)

- Monitor clinical status.

ADVERSE EFFECTS

CNS: Twitching; insomnia; nervousness; dizziness; drowsiness; dyskinesia; headache; Tourette syndrome; toxic psychosis; depressed mood; neuroleptic malignant syndrome.

CVS: Arrhythmia, angina, palpitation, tachycardia; (less common) bradycardia; hypotension or hypertension.

GI: Anorexia; abdominal pain; nausea; loss of appetite.

MISC: Fever; arthralgia; leukopenia, anemia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Patients with ADHD may have short attention spans; consider short appointment.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education
- Encourage daily plaque control procedures for effective, nontraumatic self-care.

dextroamphetamine sulfate (DEX-troe-am-FET-uh-meen SULL-fate)

Synonym: dextroamphetamine

Dexedrine, Dexedrine Spansules, Dextrostat, Liquadd

Drug Class: CNS stimulant, amphetamine

DEA Schedule: Schedule II

PHARMACOLOGY

Action
Activates noradrenergic neurons causing CNS and respiratory stimulation; stimulates satiety center in brain causing appetite suppression.

Uses
Treatment of narcolepsy, attention deficit hyperactivity disorder; adjunct therapy for short-term (i.e., no longer than a few weeks) exogenous obesity when alternative therapy has been ineffective.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Pilocarpine: Increased myopia (mechanism unknown)
- Monitor clinical status.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth; unpleasant taste.
CNS: Nervousness; tremors; dizziness; insomnia; euphoria; headache.
CVS: Arrhythmia; tachycardia; palpitation; hypertension.
MISC: Accidental injury; asthenia; fever; infection; viral infection; allergy.
GI: Diarrhea; constipation; anorexia.

CLINICAL IMPLICATIONS

General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Patients with ADHD may have short attention spans; consider short appointment.
- Monitor vital signs.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

dextromethorphan HBr (DEX-troe-meth-OR-fan HIGH-droe-BROE-mide)

Benylin DM, Creo-Terpin, Delsym, Diabetes CF, Drixoral Cough Liquid Caps, Hold DM, Pediatric Vicks 44d Dry Hacking Cough and Head Congestion, Pertussin CS, Pertussin ES, Robitussin Cough Calmers, Robitussin Pediatric, Scot-Tussin DM Cough Chasers, Silphen DM, St. Joseph Cough Suppressant, Sucrets 4-hr Cough, Sucrets Cough Control, Suppress, Trocal, Vicks Dry Hacking Cough

Balminil DM, Balminil DM Children, Benylin DM, Benylin DM 12 Hour, Benylin DM for Children, Benylin DM for Children 12 Hour, Koffex DM, Robitussin Children's, Robitussin Honey Cough DM

Athos, Bekidiba Dex, Neopulmonier, Romilar

Drug Class: Antitussive, Nonnarcotic

PHARMACOLOGY

Action

Suppresses cough by central action on cough center in medulla.

Uses

Management of nonproductive cough.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

GI: Nausea.
CNS: Dizziness; drowsiness.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider semisupine chair position to assist respiratory function.

Oral Health Education

- Inform patient that syrup has sugar and to use fluoride products to prevent dental caries.

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diazepam (DIE-aze-uh-pam)

Diastat: Gel, rectal: 2.5 mg (pediatric), 10, 15, 20 mg (adult)
Diazepam: Solution, oral: 1 mg/mL; Injection: 1, 5 mg/mL
Diazepam Intensol: Solution (intensol): 5 mg/mL
Valium: Tablets: 2, 5, 10 mg

Apo-Diazepam, Diazemuls, Valium Roche Oral

Alboral, Diatex, Ortopsique, Pacitran, Valium

Drug Class: Antianxiety; Benzodiazepine; Anticonvulsant

DEA Schedule: Schedule IV

PHARMACOLOGY

Action

Potentiates action of GABA, an inhibitory neurotransmitter, resulting in increased neural inhibition and CNS depression, especially in limbic system and reticular formation.

Uses

Management of anxiety disorders; relief of acute alcohol withdrawal symptoms; relief of preoperative apprehension and anxiety and reduction of memory recall; treatment of muscle spasms, convulsive disorders (used adjunctively), and status epilepticus.

Unlabeled Uses

Treatment of irritable bowel syndrome; relief from panic attack.

Usual Dosage

Individualize dosage; increase cautiously.

Anxiety

Adults: *PO:* 2 to 10 mg bid to qid. *IM/IV:* 2 to 10 mg; repeat in 3 to 4 hr if needed.

Preoperative (anxiety and tension)

ADULTS: *IM:* 10 mg before surgery.

Status epilepticus and severe recurrent convulsive disorders

ADULTS: *IM/IV:* (IV preferred) 5 to 10 mg initially; then 5 to 10 mg at 10-to-15 min intervals (max total dose, 30 mg). If needed, repeat in 2 to 4 hr.

CHILDREN 5 YR AND OLDER: *IM/IV*: 1 mg q 2 to 5 min (max total dose, 10 mg). If needed, repeat in 2 to 4 hr.

INFANTS AND CHILDREN 1 MO TO 5 YR: *IM/IV:* 0.2 to 0.5 mg slowly q 2 to 5 min (max total dose, 5 mg).

Pharmacokinetics

ABSORP: *IM:* Slow and erratic absorption unless administered in the deltoid muscle; C_{max} is lower than oral or IV administration.

ORAL: T_{max} is 0.5 to 2 hr.

DIST: 95% to 98% protein bound. Highly lipophilic. Crosses the placenta and is excreted in breast milk.

METAB: Metabolized in the liver (involving CYP2C19 and CYP3A4) to desmethyldiazepam (active) and two minor active metabolites.

EXCRET: The $t_{1/2}$ is 20 to 80 hr.

ONSET: Rapid.

SPECIAL POP: *Hepatic failure:* The $t_{1/2}$ is prolonged and Cl decreased in those with alcoholic cirrhosis.

Elderly: The $t_{1/2}$ is increased and Cl is decreased.

Children: The $t_{1/2}$ is longer in neonates and children under 2 yr; $t_{1/2}$ is shorter in children 2 to 16 yr.

DRUG INTERACTIONS

Acetaminophen: Possible diazepam toxicity (mechanism unknown)
- Monitor clinical status.

Itraconazole: Possible increased diazepam effect (decreased metabolism)
- Monitor clinical status.

Naproxen: Possible delayed onset of action of naproxen (delayed absorption)
- Prescribe a loading dose.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; coated tongue.

CNS: Drowsiness; confusion; ataxia; dizziness; lethargy; fatigue; apathy; memory impairment; disorientation; anterograde amnesia; restlessness; headache; slurred speech; loss of voice; stupor; coma; euphoria; irritability; vivid dreams; psychomotor retardation; paradoxical reactions (e.g., anger, hostility, mania, insomnia, muscle spasms); depression; dysarthria; hypoactivity; tremor; vertigo.

CVS: Hypotension or hypertension; bradycardia or tachycardia; palpitations.

GI: Constipation; diarrhea; nausea; anorexia; vomiting.

MISC: Dependency/withdrawal symptoms; blood dyscrasias (leukopenia, thrombocytopenia, agranulocytosis).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Monitor vital signs.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection and poor healing.

Pregnancy Risk Category: Category D. Avoid drug especially during first trimester because of possible increased risk of congenital malformations.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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diclofenac (die-KLOE-fen-ak)

Cataflam, Solaraze, Voltaren, Voltaren-XR

Apo-Diclo, Apo-Diclo Rapide, Apo-Diclo SR, Novo-Difenac, Novo-Difenac K, Novo-Difenac SR, Nu-Diclo, Nu-Diclo-SR, PMS-Diclofenac, PMS-Diclofenac SR, Voltaren Ophtha, Voltaren Rapide

3-A Ofteno, Artrenac, Cataflam, Clonodifen, Deflox, Dicloran, Dolaren, Dolflam, Dolo Pangavit-D, Fustaren, Galedol, Lifenac, Lifenal, Liroken, Logesic, Merxil, Selectofen, Volfenac Gel, Volfenac Retard, Voltaren

Drug Class: Analgesic; NSAID

PHARMACOLOGY

Action

Decreases inflammation, pain, and fever, probably through inhibition of COX activity and prostaglandin synthesis.

Uses

Treatment of rheumatoid arthritis, ankylosing spondylitis, and osteoarthritis. Potassium salt is approved for management of mild to moderate pain and primary dysmenorrhea when prompt pain relief is needed.
OPHTHALMIC: Treatment of postoperative inflammation after cataract removal; temporary relief of pain and photophobia following corneal refractive surgery.
TOPICAL: Treatment of actinic keratosis.

Unlabeled Uses

Treatment of biliary colic, enuresis, glomerular disease, gout, migraine headache, and renal colic.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Taste disorder, dry mouth, aphthous stomatitis, esophageal ulceration (<1%).
CNS: ORAL TABLET: Dizziness, headache (1% to 10%).
OPHTHALMIC: Dizziness, headache, insomnia (≤3%).
TOPICAL: Headache, anxiety, dizziness, hypokinesia (>1%).
CVS: ORAL TABLET: Palpitations; tachycardia; hypotension; hypertension.
GI: ORAL TABLET: Abdominal pain, constipation, diarrhea, dyspepsia, flatulence, gross bleeding/perforation, heartburn, nausea, GI ulcers (gastric/duodenal), vomiting (1% to 10%).
OPHTHALMIC: Abdominal pain, nausea, vomiting (≤3%).
TOPICAL: Abdominal pain, constipation, diarrhea, dyspepsia (>1%).
RESP: TOPICAL: Asthma, dyspnea, pneumonia, sinusitis (>1%).
MISC: OPHTHALMIC: Asthenia, chills, fever, pain, viral infection, facial edema (≤3%).
TOPICAL: Accidental injury, allergic reaction, asthenia, back pain, chest pain, chills, flu-like syndrome, neck pain, pain (>1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.

- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- Use COX inhibitors with caution; they may exacerbate PUD and GERD.
- *Arthritis:* Consider patient comfort and need for semisupine chair position.
- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.

dicloxacillin sodium (DIE-klox-uh-SILL-in SO-dee-uhm)

Dicloxacillin Sodium

Brispen, Cilpen, Ditterolina, Posipen

Drug Class: Antibiotic, penicillin

PHARMACOLOGY

Action

Inhibits bacterial cell wall mucopeptide synthesis.

Uses

Treatment of infections caused by penicillinase-producing staphylococcal infection; initial therapy of suspected staphylococcal infection.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Glossitis; stomatitis; sore mouth or tongue; dry mouth; furry tongue; black hairy tongue; taste perversion

CNS: Dizziness; fatigue; insomnia; reversible hyperactivity; seizures.

CVS: Tachycardia; hypotension; palpitations.

GI: Gastritis; anorexia; nausea; vomiting; abdominal pain or cramps; diarrhea or bloody diarrhea; rectal bleeding; flatulence; enterocolitis; pseudomembranous colitis.

MISC: Hypersensitivity reactions that may lead to death; vaginitis; hyperthermia; blood dyscrasias (e.g., thrombocytopenia, hemolytic anemia, leukopenia, others).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection that requires antibiotic therapy occurs, select an appropriate product from a different class of anti-infectives.
- Antibiotic-associated diarrhea may occur. Have patient contact DDS immediately if signs develop.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

dicyclomine HCl (die-SIGH-kloe-meen HIGH-droe-KLOR-ide)

Antispas, Bemote, Bentyl, Byclomine, Dibent, Dilomine, Di-Spaz, Or-Tyl

Bentylol, Lomine

Drug Class: Anticholinergic; Antispasmodic

PHARMACOLOGY

Action

Relieves smooth muscle spasm of GI tract through anticholinergic effects and direct action on GI smooth muscle.

Uses

Treatment of functional bowel/irritable bowel syndrome (e.g., irritable colon, spastic colon, mucous colitis).

Unlabeled Uses

Intestinal colic in children older than 6 mo.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disturbance.

CNS: Headache; flushing; nervousness; drowsiness; weakness; dizziness; confusion; insomnia; fever (especially in children); mental confusion or excitement (especially in elderly, even with small doses); CNS stimulation (restlessness, tremor); light-headedness.

CVS: Palpitations.

GI: Nausea; vomiting; dysphagia; heartburn; constipation; bloated feeling; paralytic ileus.

RESP: Nasal congestion.

MISC: Suppression of lactation; decreased sweating; photophobia.

CLINICAL IMPLICATIONS

General

- Anticholinergics have strong xerostomic effects. Anticipate increased caries activity and candidiasis.
- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

diflorasone diacetate (die-FLORE-ah-sone die-ASS-eh-tate)

Psorcon E: Cream: 0.05%; Ointment: 0.05%

Drug Class: Anti-inflammatory agent; Corticosteroid, topical

PHARMACOLOGY

Action

Therapeutic effects are caused by anti-inflammatory activity that is nonspecific (i.e., that act against most causes of inflammation including mechanical, chemical, microbiological, and immunological).

Uses

Relief of the anti-inflammatory and pruritic manifestations of corticosteroid responsive dermatoses.

Contraindications
Standard considerations.

Usual Dosage
Occlusive dressings may be used for certain conditions.

CREAM

ADULTS: *Topical:* Apply sparingly to affected area 1 to 3 times/day.

OINTMENT

ADULTS: *Topical:* Apply sparingly to affected area 1 to 4 times/day.

DRUG INTERACTIONS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
MISC: Systemic absorption may produce reversible hypothalamic pituitary adrenal (HPA) axis suppression, manifestations of Cushing syndrome, hyperglycemia, and glycosuria.

CLINICAL IMPLICATIONS

General
When prescribed by DDS:
- *Lactation:* Use with caution. It is not known whether topical corticosteroids could result in sufficient systemic absorption to produce adverse effects in infants.
- *Children:* Children may be more susceptible to topical corticosteroid-induced HPA axis suppression and Cushing syndrome than adults because of larger skin surface area to body weight ratio.
- *Systemic effects:* Systemic absorption of topical corticosteroids has produced reversible HPA axis suppression, Cushing syndrome, hyperglycemia, and glycosuria. Conditions that may augment systemic absorption include use over large body surface areas, prolonged use, and occlusive dressings.

Pregnancy Risk Category: Category C.

Oral Health Education
When prescribed by DDS:
- Explain name, action, and potential side effects of drug.
- Advise patient to apply medication bid as directed by health care provider.
- Caution patient not to bandage, cover, or wrap treated skin areas or use cosmetics or other skin products over treated areas unless advised by health care provider.
- Caution patient to avoid contact with the eyes. Advise patient that if medication does come into contact with the eyes, to wash eyes with large amounts of cool water and contact health care provider if eye irritation occurs.
- Advise patient that symptoms should begin to improve fairly soon after starting treatment and to notify health care provider if condition does not improve, worsens, or if application site reactions (e.g., burning, stinging, redness, itching) develop.
- Advise patient that therapy is usually discontinued when control has been achieved.
- Advise patient that follow-up visits to monitor response to treatment may be required and to keep appointments.

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diflunisal (die-FLOO-nih-sal)

Dolobid

Apo-Diflunisal, Novo-Diflunisal, Nu-Diflunisal

Drug Class: Analgesic; Salicylate

PHARMACOLOGY

Action
Decreases inflammation and relieves pain by inhibiting prostaglandin synthesis and release.

Uses
Relief of mild to moderate pain, rheumatoid arthritis, and osteoarthritis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
CNS: Headache; somnolence; insomnia; dizziness.
CVS: Palpitations; chest pain.
GI: Nausea; dyspepsia; GI pain; diarrhea; GI bleeding.
RESP: Bronchospasm.
MISC: Anaphylaxis; hypersensitivity syndrome (e.g., fever, chills, rash, liver or kidney dysfunction, leukopenia, thrombocytopenia, eosinophilia, DIC).

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Use COX inhibitors with caution, they may exacerbate PUD and GERD.
- *Arthritis:* Consider patient comfort and need for semisupine chair position.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education
- Evaluate manual dexterity; consider need for power toothbrush.

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digoxin (dih-JOX-in)
Digitek, Lanoxicaps, Lanoxin

Mapluxin
Drug Class: Cardiac glycoside

PHARMACOLOGY
Action
Increases force and velocity of myocardial systolic contraction (i.e., positive inotropic action), slows heart rate, and decreases conduction through atrioventricular node.

Uses
Treatment of CHF, atrial fibrillation, atrial flutter, paroxysmal atrial tachycardia, cardiogenic shock.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Itraconazole: Digoxin toxicity (decreased clearance)
- Avoid concurrent use.

Diazepam: Possible digoxin toxicity (decreased metabolism)
- Monitor clinical status.

Sympathomimetic amines: Increased incidence of cardiac arrhythmias (additive)
- Use local anesthetic agents containing a vasoconstrictor with caution.
- Monitor pulse rate and character.

Tetracyclines: Increased digoxin toxicity (increased absorption)
- Avoid concurrent use.

ADVERSE EFFECTS
⚠ **ORAL:** Increased gag reflex.
CNS: Headache; weakness; apathy; drowsiness; mental depression; confusion; disorientation.

CVS: Palpitation; tachycardia.
MISC: Thrombocytopenia (rare).
GI: Anorexia; nausea; vomiting; diarrhea.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Digoxin adverse effects are dose dependent and occur at doses higher than needed for therapeutic efficacy; however, doses must be titrated regularly to ensure accuracy.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Blood dyscrasias rarely reported; anticipate increased bleeding.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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diltiazem HCl (dill-TIE-uh-zem HIGH-droe-KLOR-ide)

Cardizem, Cardizem CD, Cardizem LA, Cartia XT, Dilacor XR, Diltia XT, Diltiazem Hydrochloride Extended Release, Taztia XT, Tiazac

Apo-Diltiaz, Apo-Diltiaz CD, Apo-Diltiaz Injectable, Apo-Diltiaz SR, Gen-Diltiazem, Novo-Diltiazem, Novo-Diltiazem SR, Nu-Diltiaz, Nu-Diltiaz-CD, ratio-Diltiazem CD, Rhoxal-diltiazem CD

Angiotrofin, Angiotrofin AP, Angiotrofin Retard, Presoken, Presoquim, Tilazem

Drug Class: Calcium channel blocker

PHARMACOLOGY

Action

Inhibits movement of calcium ions across cell membrane in systemic and coronary vascular smooth muscle; slows calcium ion movement across cell membranes in both cardiac muscle and cardiac pacemaker cells, decreasing sinuatrial and atrioventricular (AV) conduction.

Uses

ORAL: Treatment of angina pectoris caused by coronary artery spasm; chronic stable angina (classic effort-associated angina); essential hypertension (extended- and sustained-release forms only).
PARENTERAL: Treatment of atrial fibrillation or flutter; paroxysmal supraventricular tachycardia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Midazolam or triazolam: Increased sedation after oral administration (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, dysgeusia, thirst, gingival hyperplasia (2%).
CNS: Dizziness (6%); headache, fatigue (5%); asthenia (3%); abnormal dreams, amnesia, depression, gait abnormalities, hallucinations, insomnia, nervousness, paresthesia, person-

ality change, somnolence, tremor (<2%); lightheadedness; weakness; shakiness; extrapyramidal symptoms.
CVS: Bradycardia (6%); tachycardia, syncope, hypotension, postural hypotension, arrhythmia, chest pain, palpitations (≤2%).
GI: Nausea (1%); anorexia, constipation, diarrhea, vomiting (<2%); abdominal discomfort; cramps; dyspepsia.
RESP: Cough (2%); dyspnea (<2%).
MISC: Lower limb edema (7%); edema (5%); flushing (1%); allergic reactions, pain (<2%); angioedema; photosensitivity.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Anticipate gingival hyperplasia; consider MD consult to recommend different drug regimen if periodontal health is compromised.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

dimenhydrinate (die-men-HIGH-drih-nate)

Calm-X, Children's Dramamine, Dimetabs, Dinate, Dramamine, Dramanate, Dymenate, Triptone

Apo-Dimenhydrinate, Gravol

Vomisin

Drug Class: Antiemetic; Antivertigo; Anticholinergic

PHARMACOLOGY

Action

Directly inhibits labyrinthine stimulation for up to 3 hr.

Uses

Prevention and treatment of motion sickness, dizziness, nausea, vomiting.

Unlabeled Uses

Treatment of Ménière disease, nausea and vomiting of pregnancy, postoperative nausea, and vomiting.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, nose, throat.

CNS: Sedation; hallucinations; delirium; drowsiness; confusion, nervousness; restlessness; headache; insomnia; tingling, heaviness and weakness of hands; vertigo; dizziness; lassitude; excitation.

CVS: Palpitations; hypotension; tachycardia.

GI: Nausea; vomiting; diarrhea; GI distress; constipation; anorexia.

RESP: Tightness of chest; wheezing; thickening of bronchial secretions.

MISC: Anaphylaxis; photosensitivity.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs, including respiration rate and qualities.
- Be aware that patients with multiple allergies are at increased risk for allergy to dental drugs.
- Consider semisupine chair position to control effects of postnasal drainage.
- If GI or respiratory side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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diphenhydramine HCl (die-fen-HIGH-druh-meen HIGH-droe-KLOR-ide)

40 Winks, AllerMax Maximum Strength, Compoz Nighttime Sleep Aid, Maximum Strength Nytol, Midol PM, Snoozefast, Twilite: Tablets: 50 mg
AllerMax, Banophen Allergy, Benadryl Children's Allergy, Benadryl Children's Dye Free, Diphen AF, Scot-Tussin Allergy, Siladryl: Elixir, liquid: 12.5 mg per 5 mL
Banophen, Dormin: Tablets: 25 mg; Capsules: 25 mg
Benadryl Allergy: Capsules, soft-gels: 25 mg; Tablets: 25 mg; Tablets, chewable: 12.5 mg
Benadryl Dye Free Allergy Liqui Gels, Compoz Gel Caps: Capsules, soft gels: 25 mg
Diphenhist: Solution: 12.5 mg per 5 mL
Diphenhist Captabs, Miles Nervine, Nytol, Simply Sleep, Sleep-Eze 3, Sleepwell 2-nite: Tablets: 25 mg
Diphenhydramine, Hyrexin-50: Injection: 50 mg/mL
Genahist: Tablets: 25 mg; Capsules: 25 mg; Liquid: 12.5 mg per 5 mL
Hydramine Cough, Sylphen Cough, Tusstat: Syrup: 12.5 mg per 5 mL
Maximum Strength Sleepinal Capsules and Soft Gels, Maximum Strength Unisom SleepGels: Capsules: 50 mg
Sominex: Tablets: 25, 50 mg
Theraflu Thin Strips Multisymptom: Strips, orally disintegrating: 25 mg
Triaminic Thin Strips Cough and Runny Nose: Strips, orally disintegrating: 12.5 mg

Allerdryl, Allernix, Nytol Extra Strength, PMS-Diphenhydramine, Simply Sleep, Unisom Extra Strength, Unisom Extra Strength Sleepgels

Drug Class: Antihistamine, ethanolamine

PHARMACOLOGY

Action

Competitively antagonizes histamine at H_1 receptor sites.

Uses

Symptomatic relief of perennial and seasonal allergic rhinitis, vasomotor rhinitis, and allergic conjunctivitis; temporary relief of runny nose and sneezing caused by common cold; dermatographism; treatment of urticaria and angioedema; amelioration of allergic reactions to blood or plasma; adjunct to epinephrine and other standard measures in anaphylaxis; relief of uncomplicated allergic conditions of immediate type when oral therapy is impossible or contraindicated (parenteral form); treatment and prophylactic treatment of motion sickness (injection only); nighttime sleep aid; management of parkinsonism (including drug-induced) in elderly who are intolerant of more potent agents, in mild cases in other age groups, and in combination with centrally acting anticholinergics; control of cough, due to colds or allergy (syrup formulations).

Contraindications

Hypersensitivity to antihistamines; asthma attack; MAO inhibitor therapy; history of sleep apnea; use in newborn or premature infants and in nursing women; use as a local anesthetic.

Usual Dosage

Hypersensitivity reactions, type 1/Antiparkinsonism/Motion sickness

ADULTS: *PO:* 25 to 50 mg q 4 to 6 hr (max, 300 mg/day). *IV/IM:* 10 to 50 mg IV at a rate not exceeding 25 mg/min or 100 mg deep IM if required (max, 400 mg/day).
CHILDREN (6 TO YOUNGER THAN 12 YR OF AGE): *PO:* 12.5 to 25 mg q 4 to 6 hr (max, 150 mg). *IV/IM:* 5 mg/kg/day or 150 mg/m²/day (max, 300 mg divided into 4 doses at a rate not exceeding 25 mg/min or deep IM).

Nighttime sleep aid

ADULTS: *PO:* 50 mg at bedtime.

Pharmacokinetics

ABSORP: T_{max} is 1 to 4 hr (oral).
DIST: Widely distributed, including the CNS. Excreted in breast milk. 98% to 99% protein bound.
METAB: Metabolized in the liver.
EXCRET: A portion of the drug excreted unchanged in the urine. The $t_{1/2}$ is 1 to 4 hr.
ONSET: Rapid onset (IV or IM).
DURATION: 6 to 8 hr.

DRUG INTERACTIONS

Acetaminophen: Delayed absorption of acetaminophen (delayed gastric emptying)
- Monitor clinical status.

Metoprolol: Possible metoprolol toxicity (decreased metabolism)
- Monitor clinical status.

Venlafaxine: Possible venlafaxine toxicity (decreased metabolism)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Stomatitis; aphthous stomatitis, taste disturbance (nasal spray).
CVS: Orthostatic hypotension; palpitations; bradycardia; tachycardia; reflex tachycardia; extrasystoles; faintness.
CNS: Drowsiness (often transient); sedation; dizziness; faintness; disturbed coordination.
GI: Epigastric distress; nausea; vomiting; diarrhea; constipation; change in bowel habits.
RESP: Thickening of bronchial secretions; chest tightness; wheezing; respiratory depression.
MISC: Hypersensitivity reactions; photosensitivity.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider semisupine chair position to control effects of postnasal drainage.
- Be aware that patients with multiple allergies are at increased risk for allergy to dental drugs.
- If GI or respiratory side effects occur, consider semisupine chair position.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Monitor vital signs.

When prescribed by DDS:

- *Lactation:* Excreted in breast milk.
- *Children:* Overdosage may cause hallucinations, convulsions, and death. Antihistamines may diminish mental alertness. In young children, drug may produce paradoxical excitation. Use with caution in children younger than 2 yr of age.
- *Elderly:* Greater risk of dizziness, excessive sedation, syncope, toxic confusional states, and hypotension in patients older than 60 yr of age. Dosage reduction may be required.
- *Hypersensitivity:* May occur. Have epinephrine 1:1,000 immediately available.
- *Hepatic failure:* Use with caution in patients with cirrhosis or other liver diseases.
- *Special risk:* Use with caution in patients predisposed to urinary retention, prostatic hypertrophy, history of bronchial asthma, increased intraocular pressure, hyperthyroidism, CV disease, or hypertension. Use with considerable caution in patients with narrow-angle glaucoma, stenosing peptic ulcer, pyloroduodenal obstruction, symptomatic prostatic hypertrophy, or bladder neck obstruction.
- *Sulfite sensitivity:* Some diphenhydramine products may contain sulfites as preservatives and aspartame as sweetener. Avoid in sulfite-allergic patients and in patients with phenylketonuria, respectively.
- *Respiratory disease:* Generally not recommended to treat lower respiratory tract symptoms, including asthma.
- *Overdosage:* Circulatory collapse; cardiac arrest; respiratory depression or arrest; toxic psychosis; coma; stupor; seizures; ataxia; anxiety; incoherence; hyperactivity; combativeness; anhidrosis; fever; hot, dry, or flushed skin; dry mucous membranes; dysphagia; decreased bowel sounds; dilated and sluggish pupils.

Pregnancy Risk Category: Category B.

Oral Health Education

When prescribed by DDS:

- Explain name, dose, action, and potential side effects of drug.
- Caution patient using OTC product to read package label before using and not to exceed dose or frequency of administration instructions.
- Advise patient to take each dose without regard to meals but to take with food if stomach upset occurs.
- Advise patient using diphenhydramine to prevent motion sickness to take first dose at least 30 min before exposure to motion and take subsequent doses after each meal and at bedtime for duration of journey.
- Advise patient using diphenhydramine as a sleep aid to take dose at least 30 min before bedtime and not to use for more than 2 wk. Caution patient that if insomnia persists for more than 2 wk, it may be a symptom of a serious underlying illness and to inform health care provider.
- Advise patient or caregiver using liquid, oral solution, elixir, or syrup to measure and administer prescribed dose using dosing syringe, dosing spoon, or dosing cup.
- Advise patient that if a dose is missed to take it as soon as possible unless it is nearing time for the next scheduled dose, then advise patient to skip the missed dose and take the next dose at the regularly scheduled time. Caution patient not to double the dose to catch up.

- Advise patient that if allergy symptoms are not controlled not to increase the dose of medication or frequency of use but to inform his or her health care provider. Caution patient that larger doses or more frequent dosing does not increase effectiveness and may cause excessive drowsiness or other side effects.
- Instruct patient to stop taking drug and immediately report any of the following symptoms to health care provider: persistent dizziness; excessive drowsiness; severe dry mouth, nose, or throat; flushing; unexplained shortness of breath or difficulty breathing; unusual tiredness or weakness; sore throat, fever, or other signs of infection; bleeding or unusual bruising; fast or irregular heartbeat; excitability, confusion, or changes in thinking or behavior; chest tightness; difficulty urinating.
- Advise patient that medication may cause drowsiness or dizziness and not to drive or perform other activities requiring mental alertness until tolerance is determined.
- Advise patient to take sips of water, suck on ice chips or sugarless hard candy, or chew sugarless gum if dry mouth occurs.
- Caution patient that alcohol and other CNS depressants (e.g., sedatives) will have additional sedative effects if taken with diphenhydramine.
- Caution patient not to take any OTC antihistamines or any other product containing diphenhydramine, including topical products, while taking this medication unless advised by health care provider.
- Caution patient that medication may cause sensitivity to sunlight and to avoid excessive exposure to the sun or UV light (e.g., tanning booths) and to wear protective clothing and use sunscreens until tolerance is determined.
- If patient is to have allergy skin testing, advise patient not to take the medication for at least 4 days before the skin testing.
- Advise women to notify health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Caution patient not to take any prescription or OTC medications, herbal preparations, or dietary supplements unless advised by health care provider.

dipyridamole (DIE-pih-RID-uh-mole)

Dipyridamole, Persantine

Dirinol, Lodimol, Trompersantin

Drug Class: Antiplatelet; Diagnostic agent

PHARMACOLOGY

Action

Lengthens abnormally shortened platelet survival time in a dose-dependent manner by inhibiting platelet aggregation in response to various stimuli, such as platelet activating factor, collagen, and adenosine diphosphate. Vasodilation may result from inhibition of adenosine uptake, which is an important mediator of coronary vasodilation.

Uses

Adjunct to coumarin anticoagulants in prevention of postoperative thromboembolic complication of cardiac valve replacement (oral). Alternative to exercise in thallium myocardial perfusion imaging for evaluating coronary artery disease in patients who cannot exercise adequately (IV).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: ORAL: Dizziness (14%); headache (2%); fatigue; malaise.
IV: Headache, dizziness (12%); paresthesia, fatigue (1%).

GI: ORAL: Abdominal distress (6%); diarrhea; vomiting; nausea, dyspepsia.
IV: Nausea (5%); dyspepsia (1%).

RESP: IV: Dyspnea (3%).

MISC: ORAL: Flushing; hypersensitivity (e.g., rash, urticaria, severe bronchospasm, angioedema); arthritis; paresthesia.
IV: Flushing, unspecific pain (3%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine history of increased bleeding and risk for bleeding after treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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disopyramide phosphate (DIE-so-PIR-uh-mide)

Norpace, Norpace CR

Rythmodan, Rythmodan-LA

Dimodan

Drug Class: Antiarrhythmic

PHARMACOLOGY

Action

Decreases rate of diastolic depolarization; decreases upstroke velocity; increases action potential duration; prolongs refractory period.

Uses

Suppression and documented prevention of ventricular arrhythmias considered to be life threatening.

Unlabeled Uses

Treatment of paroxysmal supraventricular tachycardia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (32%).
CNS: Dizziness, fatigue, headache, malaise (3% to 9%); nervousness (1% to 3%).
CVS: Hypotension, arrhythmia, syncope, chest pain, CHF signs.
GI: Constipation (11%); nausea, pain/bloating/gas (3% to 9%); anorexia, diarrhea, vomiting (1% to 3%).
RESP: Shortness of breath (1% to 3%).
MISC: Aches, pain (3% to 9%); thrombocytopenia, agranulocytosis (rare).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or

in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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disulfiram (die-SULL-fih-ram)

Antabuse

Drug Class: Antialcoholic agent

PHARMACOLOGY

Action
Produces intolerance to alcohol by blocking oxidation of acetaldehyde by enzyme aldehyde dehydrogenase, resulting in high blood levels of acetaldehyde and unpleasant physical symptoms.

Uses
Aid in management of alcoholism in selected patients who want to remain in state of enforced sobriety.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Benzodiazepines: Possible benzodiazepine toxicity (decreased metabolism)
- Monitor clinical status.

Metronidazole: Organic brain syndrome (mechanism unknown)
- Avoid concurrent use.

ADVERSE EFFECTS
⚠ **ORAL:** Taste disturbances.

CNS: Drowsiness; fatigue; headache; psychotic reactions.

GI: Nausea, vomiting (if alcohol ingested).

MISC: Peripheral neuropathy; polyneuritis; optic or peripheral neuritis; impotence.

CLINICAL IMPLICATIONS

General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine whether patient is in a professional treatment program.
- Avoid prescribing opioids for dental pain. Acetaminophen is appropriate if GI bleeding is present.
- Do not recommend or prescribe alcohol-containing mouth rinses.
- Be aware that patient may be taking opioid antagonists and CNS depressant drugs.
- Liver disease may be present resulting in increased bleeding due to a deficiency of vitamin K–dependent clotting factors.
- Alcohol and tobacco use and abuse predispose to oral squamous cell carcinoma; perform oral cancer exam routinely.

Oral Health Education
- Most patients with alcoholism have poor oral health due to neglect. Encourage daily self-care to prevent periodontal disease.

docosanol (doe-KOE-sah-nole)

Abreva: Cream: 10%

Drug Class: Antiviral, topical

PHARMACOLOGY

Action
Prevents fusion of herpes simplex virus with cell membrane, thereby blocking entry and viral replication.

Uses
Cold sores, fever blisters.

Contraindications
Age 11 yr and younger.

DRUG INTERACTIONS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Tingling at application site.

CLINICAL IMPLICATIONS

General
- Topical OTC cream to be applied by cotton bud 5 times a day during prodromal period of herpes labialis outbreak to shorten healing time and duration of symptoms.
- FDA approved for children older than age 12 yr and adults.

Oral Health Education
- Warn patient to wash hands after use and to apply agent with cotton bud, not fingers, because herpes virus in contagious.
- Instruct patient to apply at first sign of extraoral herpes outbreak; not intended for use inside mouth.

dofetilide (doe-FEH-till-ide)

Tikosyn

Drug Class: Antiarrhythmic

PHARMACOLOGY

Action
Blockade of the cardiac ion channel carrying the rapid component of the delayed rectifier potassium currents.

Uses
Maintenance of normal sinus rhythm (delay in time to recurrence of atrial fibrillation/atrial flutter [AF/AFl]) in patients with AF/AFl of more than 1 wk duration who have been converted to normal sinus rhythm; conversion of AF/AFl to normal sinus rhythm.

Unlabeled Uses
Ventricular arrhythmias.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Ketoconazole or itraconazole: Increased cardiac arrhythmias (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS

CNS: Headache; dizziness; insomnia; migraine.
CVS: Bradycardia, syncope, cerebral stroke (≤2%).
GI: Diarrhea; abdominal pain.
RESP: Respiratory tract infection; dyspnea.
MISC: Flu-like syndrome; back pain; edema; facial paralysis; paralysis; paresthesia; sudden death.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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donepezil (dawn-EPP-uh-zill)

Aricept

Eranz

Drug Class: Reversible cholinesterase inhibitor

PHARMACOLOGY

Action

Increases acetylcholine by inhibiting acetylcholinesterase, thereby increasing cholinergic function.

Uses

Treatment of mild to moderate dementia of the Alzheimer type.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole: Possible donepezil toxicity (mechanism unknown)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Tooth pain (unspecified).
CNS: Depression; abnormal dreams; somnolence; insomnia; fatigue; dizziness.
CVS: Postural hypotension, syncope (2%); hypotension or hypertension; bradycardia; tachycardia.
GI: Nausea (11%); diarrhea; vomiting; anorexia; fecal incontinence; GI bleeding; bloating; epigastric pain.
RESP: Dyspnea; sore throat; bronchitis.
MISC: Muscle cramps; arthritis; ecchymoses (4%); thrombocytopenia, eosinophilia (<1%).

CLINICAL IMPLICATIONS

General

- Patient may experience hypotension or hypertension. Monitor vital signs at each appointment; anticipate syncope.

- Ensure that caregiver is present at every dental appointment and understands informed consent.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Teach caregiver to assist patient with oral self-care practices.

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doxazosin mesylate (DOX-uh-ZOE-sin MEH-suh-late)

Cardura

Apo-Doxazosin, Cardura-1, Cardura-2, Cardura-4, Gen-Doxazosin, Novo-Doxazosin, ratio-Doxazosin

Drug Class: Antihypertensive; Antiadrenergic, peripherally acting

PHARMACOLOGY

Action

Selectively blocks postsynaptic alpha$_1$-adrenergic receptors, resulting in dilation of arterioles and veins.

Uses

Treatment of hypertension, alone or in combination with other agents; treatment of benign prostatic hyperplasia (BPH).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (2%), taste perversion (<0.5%).

CNS: Dizziness (19%); headache (14%); fatigue/malaise (12%); somnolence (5%); vertigo, nervousness (2%); anxiety, kinetic disorders, ataxia, hypertonia, muscle cramps, insomnia, depression (1%).

CVS: Postural hypotension (<2%); palpitation, chest pain, arrhythmia, syncope (1%).

GI: Nausea (3%); diarrhea (2%); constipation, dyspepsia, flatulence (1%).

RESP: Dyspnea, rhinitis (3%); respiratory disorder (1%).

MISC: Pain, chest pain (2%); flushing, rash, pruritus (1%); leukopenia, thrombocytopenia (<0.5%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.

- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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doxepin HCl (DOX-uh-pin HIGH-droe-KLOR-ide)

Sinequan, Zonalon

Apo-Doxepin, Novo-Doxepin

Drug Class: Antianxiety; Antidepressant, tricyclic

PHARMACOLOGY

Action

Moderately blocks reuptake of norepinephrine and weakly blocks reuptake of serotonin; also produces antihistaminic and anticholinergic activity.

Uses

Treatment of psychoneurotic patients with depression and/or anxiety; depression and/or anxiety associated with alcoholism (not to be taken concomitantly with alcohol); depression and/or anxiety associated with organic disease (the possibility of drug interaction should be considered if the patient is receiving other drugs concomitantly); psychotic depressive disorders with associated anxiety including involutional depression and manic-depressive disorders; moderate pruritus with atopic dermatitis or lichen simplex chronicus (topical).

Unlabeled Uses

Neurogenic pain, peptic ulcer disease.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Sympathomimetic amines: Hypertension and hypertensive crisis with epinephrine (inhibition of epinephrine uptake)

- Use local anesthetic agents containing a vasoconstrictor with caution.
- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste perversion; aphthous stomatitis.

CNS: Dizziness; drowsiness; headache; confusion; weakness; tremors; convulsions; fatigue; disorientation; hallucinations; numbness; paresthesias; ataxia; extrapyramidal symptoms; tardive dyskinesia.

CVS: Tachycardia; palpitations; arrhythmia; postural hypotension; hypotension; hypertension.

GI: Nausea; constipation; paralytic ileus; vomiting; indigestion; diarrhea; anorexia.

RESP: Exacerbation of asthma.

MISC: Hyperthermia; alopecia; sweating; chills.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- Monitor vital signs.
- *When prescribed by DDS:* May produce sedation, interfere with eye-hand coordination, and the ability to operate mechanical equipment. Inform patient not to drive, sign important papers, or operate mechanical equipment.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Evaluate manual dexterity; consider need for power toothbrush.

When prescribed by DDS:

- Warn patient not to drink alcoholic products while taking the drug.
- Warn patient not to drive, sign important papers, or operate mechanical equipment.

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doxycycline hyclate (DOX-ee-SIGH-kleen)

Atridox: Local application: 42.5 mg (as hyclate, 10%)
Doryx: Capsules, coated pellets: 75, 100 mg (as hyclate)
Monodox: Capsules: 50, 100 mg (as monohydrate)
Periostat: Tablets: 20 mg (as hyclate)
Vibramycin: Powder for Oral Suspension: 25 mg (as monohydrate) per 5 mL when reconstituted; Syrup: 50 mg per 5 mL (as calcium)
Vibra-Tabs: Tablets: 100 mg (as hyclate)
Adoxa, Doxy 100, Doxy 200

Apo-Doxy, Apo-Doxy-Tabs, Doxycin, Novo-Doxylin, Nu-Doxycycline, ratio-Doxycycline

Vibramicina

Drug Class: Antibiotic, tetracycline

PHARMACOLOGY

Action

Inhibits bacterial protein synthesis.

Uses

Treatment of infections caused by susceptible strains of gram-positive and gram-negative bacteria (e.g., *Rickettsia*, *Mycoplasma pneumoniae*); treatment of trachoma and susceptible infections when penicillins are contraindicated; treatment of acute intestinal amebiasis; uncomplicated gonorrhea in adults; prophylaxis of malaria caused by *Plasmodium falciparum*; anthrax (including inhalational anthrax); severe acne.

Periodontitis

TABLET: Adjunct treatment to scaling and root planing to promote attachment level gain and reduce pocket depth.

SUBGINGIVAL APPLICATION: For chronic adult periodontitis for a gain in clinical attachment, reduction in probing depth, and reduction in bleeding on probing.

Contraindications

Hypersensitivity to tetracyclines; nursing mothers, infants, and children (Periostat).

Usual Dosage

Infection

ADULTS AND CHILDREN OLDER THAN 8 YR AND WEIGHING MORE THAN 45 KG: *PO:* 200 mg on the first day (100 mg q 12 hr) then 100 mg/day.

CHILDREN OLDER THAN 8 YR AND WEIGHING 45 KG OR LESS: *PO:* 4.4 mg/kg divided into two doses on day 1 followed by 2.2 mg/kg/day as a single dose or divided into two doses on subsequent days. For more severe infections, 4.4 mg/kg may be used.

Periodontitis (Periostat, Atridox)

ADULTS: *PO:* 20 mg bid as an adjunct following scaling and root planing for up to 9 mo. Administer tablets at least 2 hr before or after meals.

ADULTS: *Subgingival Application:* Variable dose, depending on the size, shape, and number of pockets being treated (see product information for preparation and administration).

Pharmacokinetics

ABSORP: Well absorbed. T_{max} is 2 hr (oral). C_{max} is 2.6 mcg/mL (200-mg oral dose), 2.5 to 3.6 mcg/mL (100- to 200-mg IV dose). Absorption may be decreased by 20% when given with food or milk.

DIST: Bound to plasma proteins. Crosses the placenta; excreted in breast milk.

EXCRET: Approximately 40% excreted by the kidneys in 72 hr. The $t_{1/2}$ is 18 to 22 hr.

SPECIAL POP: *Renal failure:* Excretion by the kidneys may fall as low as 1% to 5% in 72 hr in those with Ccr less than 10 mL/min.

DRUG INTERACTIONS

Anticoagulants, oral: Increased anticoagulant effect (mechanism unknown)
- Avoid concurrent use or monitor prothrombin time.

Barbiturates: Decreased doxycycline effect (increased metabolism)
- Avoid concurrent use.

Carbamazepine: Decreased doxycycline effect (increased metabolism)
- Avoid concurrent use.

Digoxin: Possible digoxin toxicity (decreased metabolism)
- Avoid concurrent use.

Methotrexate: Possible methotrexate toxicity (mechanism unknown)
- Avoid concurrent use.

Phenytoin: Decreased doxycycline effect (increased metabolism)
- Avoid concurrent use.

Rifampin: Possible decreased doxycycline effect (increased metabolism)
- Avoid concurrent use.

Theophylline: Possible theophylline toxicity (mechanism unknown)
- Avoid concurrent use.

Zinc, calcium, magnesium, iron, or aluminum preparation: Decreased doxycycline effect (decreased absorption)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Glossitis; dysphagia; candidiasis; sore throat; black hairy tongue.

CNS: Dizziness; headache; pseudotumor cerebri (manifested by headache and blurred vision).

GI: Anorexia; nausea; vomiting; diarrhea; enterocolitis; inflammatory lesions (with monilial overgrowth) in anogenital area; abdominal pain or discomfort; bulky loose stools; sore throat.

MISC: Bulging fontanelle (infants); benign intracranial hypertension (adults); photosensitivity.

CLINICAL IMPLICATIONS

General

When prescribed by DDS:
- *Lactation:* Excreted in breast milk.
- *Children:* Not recommended in children younger than 8 yr of age; abnormal bone formation and tooth discoloration may result.
- *Renal failure:* Dosage reduction may be required.
- *Hepatic failure:* Doses greater than 2 g/day associated with liver failure; monitor function and avoid other hepatotoxic drugs.

- *Superinfection:* Prolonged use may result in bacterial or fungal overgrowth (100 mg dose).
- *Photosensitivity:* Photosensitivity may occur; avoid exposure to sunlight or ultraviolet light.
- *Special considerations:* Doxycycline periodontal local application has not been clinically evaluated for use in the regeneration of alveolar bone, use in immunocompromised patients, or for use in patients with conditions involving extremely severe periodontal defects with very little remaining periodontium.
- Obtain patient history, including drug history and any known allergies. Note renal or hepatic impairment, sulfite sensitivity (oral syrup only), or history of allergy or intolerance to other tetracycline antibiotics.
- Ensure that women are not pregnant or breast-feeding.

Pregnancy Risk Category: Category D.

Oral Health Education

When prescribed by DDS:

- Explain name, dose, action, and potential side effects of drug.
- Review dosing schedule and prescribed length of therapy with patient. Advise patient that dose and duration of therapy are dependent on site and cause of infection.
- Instruct patient using tablets or capsules to take prescribed dose with a full glass of water.
- Advise patient to take without regard to meals but to take with food if GI upset occurs.
- Advise patient using other oral doxycycline products to take 1 hr before or 2 hr after antacids containing aluminum, calcium, or magnesium, or preparations containing iron or zinc.
- Instruct patient to complete entire course of therapy, even if symptoms of infection have disappeared.
- Advise patient to discontinue therapy and contact health care provider immediately if skin rash, hives, itching, shortness of breath, headache, or blurred vision occurs.
- Advise patient that medication may cause photosensitivity (i.e., sensitivity to sunlight) and to avoid unnecessary exposure to sunlight or tanning lamps and to use sunscreens and wear protective clothing to avoid photosensitivity reactions.
- Caution women taking oral contraceptives that doxycycline may make birth control pills less effective and to use nonhormonal forms of contraception during treatment.
- Advise women to notify health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Caution patient that drug may cause dizziness, light-headedness, or blurred vision and to use caution while driving or performing other hazardous tasks until tolerance is determined.
- Advise patient to report the following signs of superinfection to health care provider: black "furry" tongue, white patches in mouth, foul-smelling stools, or vaginal itching or discharge.
- Warn patient that diarrhea containing blood or pus may be a sign of a serious disorder and to seek medical care if noted and not treat at home.
- Caution patient not to take any prescription or OTC medications, dietary supplements, or herbal preparations unless advised by health care provider.
- Advise patient to discard any unused doxycycline by the expiration date noted on the label.
- Advise patient that follow-up examinations and laboratory tests may be required to monitor therapy and to keep appointments.

Periostat

- Inform patient that this antibiotic will be taken daily for up to 9 mo to help treat periodontitis.
- Warn patient that although this is a tetracycline antibiotic, the dose is too small to treat infections and should not be used for that purpose.
- Instruct patient to take 1 hr before or 2 hr after meals with a full glass of water.
- Advise patient to take either 2 hr before or 2 hr after antacids containing aluminum, calcium, or magnesium, preparations containing iron or zinc, or dairy products (e.g., milk, cheese, ice cream).

Subgingival application

- Caution patient to avoid any mechanical oral hygiene procedure (e.g., tooth brushing, flossing) on any treated areas for 7 days after application.

duloxetine HCl (doo-LOX-eh-teen HIGH-droe-KLOR-ide)

Cymbalta

Drug Class: Antidepressant

PHARMACOLOGY

Action

Unknown; however, potentiation of serotonergic and noradrenergic activity in the CNS is suspected.

Uses

Treatment of major depressive disorder.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (15%).

CNS: Insomnia (11%); dizziness (9%); fatigue (8%); somnolence (7%); tremor, anxiety, decreased libido, abnormal orgasm (3%); initial insomnia, irritability, lethargy, nervousness, nightmare, restlessness, sleep disorder (≥1%).

CVS: Hot flushes; palpitations; hypertension.

MISC: Back pain; arthralgia.

GI: Nausea (20%); constipation (11%); diarrhea (8%); vomiting (5%); gastritis (≥1%).

RESP: URI; cough.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Prescribe CNS depressants in small quantities for limited amounts of time.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

dutasteride (doo-TASS-teer-ide)

Avodart

Drug Class: Androgen hormone inhibitor

PHARMACOLOGY

Action

Inhibits the conversion of testosterone to 5-alpha-dihydrotestosterone, a potent androgen.

Uses

Treatment of symptomatic benign prostatic hyperplasia in men with an enlarged prostate.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

MISC: Impotence; decreased libido.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.

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dyclonine (DIE-kloe-neen)

Synonym: dyclonine hydrochloride

Dyclone (Rx); Sucrets (OTC); Cepacol Maximum Strength (OTC): Solution (Dyclone): 0.5% (30 mL) and 1% (30 mL); Lozenge (Sucrets): 1.2 mg, 2 mg, 3 mg with cherry, lemon, and wintergreen flavors; Spray (Cepacol Maximum Strength): 0.1% (120 mL) with cherry and lemon flavors

Drug Class: Topical anesthetic agent

PHARMACOLOGY

Action

Inhibits nerve impulses from sensory nerves, thus producing local anesthesia; blocks nerve impulses as a result of decreased nerve membrane permeability to sodium influx.

Uses

Anesthesia of mucous membranes of mouth and pharynx before various procedures.

Contraindications

Hypersensitivity to dyclonine and chlorobutanol (preservative used in dyclonine).

Usual Dosage

Apply individualized amount depending on patient need; use lowest effective dose; max recommended dose is 30 mL of a 1% solution (300 mg); reduce dosage for elderly and pediatric patients.

Oral Mucous Membranes

Use the lowest dose needed to provide effective anesthesia.

ADULTS AND CHILDREN 2 YR OF AGE AND OLDER: Swab or rinse, and then spit with 5 to 10 mL of 0.5% or 1% solution 3 to 4 times/day as needed.

Slowly dissolve 1 lozenge in mouth every 2 hours as needed.

Pharmacokinetics

ONSET: 2 to 10 min.

DURATION: 30 to 60 min.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No evidence of drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Allergy: stomatitis, perioral edema, urticaria.

MISC: Anaphylaxis; allergic reactions (urticaria, edema, contact dermatitis).

CLINICAL IMPLICATIONS

General

- Inquire about possibility of allergy. Low incidence of side effects following topical application.
- Evacuate excess solution with saliva ejector.

- Limit area of application, especially in denuded or inflamed tissue.
- Dry area of application before applying solution.
- Systemic toxicity: Signs include nervousness, nausea, and excitement followed by drowsiness, convulsions, and cardiac and respiratory depression. Symptoms depend on amount of drug absorbed.

Pregnancy Risk Category: Pregnancy category C.

Oral Health Education
- Caution about biting on oral tissue if anesthesia is profound.
- Avoid chewing gum or eating following oral procedures until numbness is eliminated.

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efavirenz (EH-fah-VIE-renz)

Sustiva

Drug Class: Antiretroviral, non-nucleoside reverse transcriptase inhibitor

PHARMACOLOGY

Action
Noncompetitive inhibition of HIV-1 reverse transcriptase.

Uses
Treatment of HIV-1 infection in combination with other antiretroviral agents.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Midazolam or triazolam: Prolonged sedation following oral administration (decreased metabolism)
- Monitor clinical status.

ADVERSE EFFECTS
⚠ **ORAL:** Mucosal ulceration.

CNS: Dizziness (28.1%); fatigue, headache, hypesthesia, impaired concentration (8.3%); insomnia (16.3%); abnormal dreams (6.2%); somnolence (7%); depression; anorexia; nervousness; ataxia; confusion; impaired coordination; paresthesia; neuropathy; tremor; agitation; emotional lability; hallucination; psychosis.

CVS: Flushing; palpitations.

GI: Nausea; vomiting; diarrhea; dyspepsia; abdominal pain.

RESP: Cough; dyspnea.

MISC: Arthralgia; myalgia; asthenia; fever; pain.

CLINICAL IMPLICATIONS

General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- If GI side effects occur, consider semisupine chair position.
- Anticipate oral candidiasis when HIV disease is reported.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values improve above this level.

Oral Health Education
- Evaluate manual dexterity; consider need for power toothbrush.
- Recommend frequent maintenance prophylaxis when immunosuppression is evident.
- Encourage daily plaque control procedures for effective self-care since HIV infection reduces host resistance.

eletriptan hydrobromide (ell-eh-TRIP-tan HIGH-droe-BROE-mide)

Relpax

Drug Class: Analgesic, migraine

PHARMACOLOGY

Action

Selective agonist for vascular serotonin (5-HT_1) receptor subtype, causing vasoconstriction of cranial arteries.

Uses

Acute treatment of migraine with or without aura.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole or itraconazole: Increased vasospastic effect of eletriptan (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (4%); dysphagia (e.g., throat tightness, difficulty swallowing) (2%).

CNS: Dizziness, somnolence (7%); headache (4%); hypertonia, hypesthesia, paresthesia, vertigo (≥1%).

GI: Nausea (8%); dyspepsia.

RESP: Pharyngitis (≥1%).

MISC: Asthenia (10%); pain, tightness, or pressure in chest (4%); stomach pain, cramps, or pressure, abdominal pain or discomfort (2%); back pain, chills (≥1%).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse). Drugs for prevention are sympatholytic; drugs for treatment of acute attack are sympathomimetic.
- If GI side effects occur, consider semisupine chair position.
- This drug is for acute use during migraine attack. Patient is unlikely to present for oral health care appointment.

emtricitabine (em-try-SIGH-tah-bean)

Emtriva

Drug Class: Antiviral

PHARMACOLOGY

Action

Inhibits activity of HIV-1 reverse transcriptase by competing with the natural substrate deoxycytidine 5′-triphosphate and by being incorporated into nascent viral DNA, resulting in chain termination.

Uses

In combination with other antiretroviral agents for the treatment of HIV-1 infections in adults.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Headache (13%); insomnia (7%); depressive disorders (6%); paresthesia (5%); dizziness, neuropathy/peripheral neuritis (4%); abnormal dreams (2%).

GI: Diarrhea (23%); nausea (18%); vomiting (9%); dyspepsia (4%), abdominal pain (8%).
RESP: Increased cough (14%).
MISC: Asthenia (16%); arthralgia (3%); myalgia (4%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- Anticipate oral candidiasis when HIV disease is reported.
- If GI side effects occur, consider semisupine chair position.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values improve above this level.

Oral Health Education

- Recommend frequent maintenance prophylaxis when immunosuppression is evident.
- Encourage daily plaque control procedures for effective self-care since HIV infection reduces host resistance.

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enalapril maleate (EH-NAL-uh-prill MAL-ee-ate)

Vasotec, Vasotec IV

Enaladil, Feliberal, Glioten, Kenopril, Norpril, Palane, Pulsol, Renitec

Drug Class: Antihypertensive; ACE inhibitor

PHARMACOLOGY

Action

Competitively inhibits angiotensin I–converting enzyme, preventing conversion of angiotensin I to angiotensin II, a potent vasoconstrictor that also stimulates release of aldosterone. Results in decrease in BP, reduced sodium absorption, and potassium retention.

Uses

Treatment of hypertension and symptomatic CHF in combination with diuretics and digitalis and asymptomatic left ventricular dysfunction.

Unlabeled Uses

Treatment of diabetic nephropathy, childhood hypertension, hypertension related to scleroderma, and renal crisis scleroderma.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased hypertensive effect (decreased prostaglandin synthesis)

- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Stomatitis, taste alterations, glossitis, dry mouth (1%).
CNS: Headache (5%); dizziness (4%); fatigue (3%); vertigo (2%); asthenia (1%).
CVS: Chest pain; hypotension; orthostatic hypotension.
GI: Abdominal pain, diarrhea (2%); nausea, vomiting (1%).
RESP: Bronchitis, cough, dyspnea (1%).
MISC: Neutropenia, thrombocytopenia, bone marrow suppression (0.5% to 1%).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is $\geq 180/110$ or

in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- If coughing is problematic, consider semisupine chair position for treatment.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

enfuvirtide (en-FYOO-veer-tide)

Fuzeon

Drug Class: Antiretroviral, fusion inhibitor

PHARMACOLOGY

Action
Interferes with entry of HIV-1 into cells by inhibiting fusion of viral and cellular membranes.

Uses
In combination with other antiretroviral agents for the treatment of HIV-1 infection in treatment-experienced patients with evidence of HIV-1 replication despite ongoing antiretroviral therapy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Herpes simplex; taste disturbance.

CNS: Fatigue; peripheral neuropathy; insomnia; depression; anxiety; decreased appetite; Guillain-Barré syndrome; sixth cranial nerve palsy.

GI: Diarrhea; nausea; anorexia; constipation; upper abdominal pain (3%); pancreatitis.

RESP: Cough; sinusitis; pneumonia.

MISC: Influenza; flu-like symptoms; myalgia; fever.

CLINICAL IMPLICATIONS

General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- Anticipate oral candidiasis when HIV disease is reported.
- If GI side effects occur, consider semisupine chair position.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values improve above this level.

Oral Health Education

- Recommend frequent maintenance prophylaxis when immunosuppression is evident.
- Encourage daily plaque control procedures for effective self-care since HIV infection reduces host resistance.

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enoxaparin sodium (eh-NOX-uh-par-in SO-dee-uhm)

Lovenox

Lovenox HP

Clexane

Drug Class: Anticoagulant; Low molecular weight heparin

PHARMACOLOGY

Action

Causes higher anti-factor Xa to antithrombin activities (anti-factor IIa) ratio than heparin, which may prevent thrombosis.

Uses

Prevention of deep vein thrombosis (DVT), which may lead to pulmonary embolism (PE) in patients undergoing hip or knee replacement surgery or abdominal surgery; in conjunction with warfarin sodium for inpatient treatment of acute DVT with and without PE or outpatient treatment of acute DVT without PE; prevention of ischemic complications of unstable and non-Q-wave MI when coadministered with aspirin in medical patients who are at risk for thromboembolic complications due to severely restricted mobility during acute illness.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Increased risk of bleeding (additive)

- Avoid concurrent use.

ADVERSE EFFECTS

GI: Nausea (3%); diarrhea.

RESP: Dyspnea (3.3%).

MISC: Local irritation and pain; hematoma, hemorrhage (4% to 13 %); thrombocytopenia; nausea; confusion; fever; edema; peripheral edema; injection site hemorrhage; epidural or spinal hematoma; systemic allergic reactions (i.e., pruritus, urticaria, anaphylactoid reactions); vesiculobullous rash; purpura; thrombocytosis; hyperlipidemia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine prothrombin time or INR before completing procedures that may result in significant bleeding. Safe level of INR for invasive dental procedures is 2-3. INR is calculated from PT.
- If uncontrolled bleeding develops, use hemostatic agents and positive pressure to induce hemostasis. Do not dismiss patient until bleeding is controlled.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Monitor frequently to ensure adequate clotting during treatment that involves bleeding.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

entacapone (en-TACK-ah-pone)

Comtan

Drug Class: Antiparkinson

PHARMACOLOGY

Action

The exact mechanism of action is unknown. Inhibits catechol-*O*-methyl transferase (COMT), thus blocking the degradation of catechols including dopamine and levodopa. This may lead to more sustained levels of dopamine and consequently a more prolonged antiparkinson effect.

Uses

As an adjunct to levodopa/carbidopa for the treatment of idiopathic Parkinson disease in patients who experience signs and symptoms of end-of-dose "wearing-off."

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Sympathomimetic amines: Tachycardia (mechanism unknown)

- Use local anesthetic agents containing a vasoconstrictor with caution.
- Monitor pulse rate and character.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (3%); taste disturbance (1%).

CNS: Dyskinesia; hyperkinesia; hypokinesia; dizziness; anxiety; somnolence; agitation; hallucinations.

GI: Nausea; diarrhea; abdominal pain; constipation; vomiting; dyspepsia; flatulence; gastritis.

RESP: Dyspnea.

MISC: Sweating; back pain; fatigue; asthenia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Extrapyramidal behaviors associated with Parkinson disease can complicate access to oral cavity and complicate oral procedures.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Evaluate manual dexterity; consider need for power toothbrush.

entecavir (en-TE-ka-vihr)

Baraclude

Drug Class: Antiviral agent

PHARMACOLOGY

Action

Inhibits hepatitis B virus (HBV) polymerase (reverse transcriptase) by competing with the natural substrate deoxyguanosine triphosphate.

Uses

Treatment of chronic hepatitis B virus in adults with evidence of active viral replication and either evidence of persistent elevations in serum aminotransferases (ALT or AST) or histologically active disease.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Headache (4%); fatigue (3%).

GI: Diarrhea, dyspepsia (1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment. Take precautions to avoid cross-contamination.
- Consider medical consult to determine disease control and influence on dental treatment.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care because viral infection reduces host resistance.
- Recommend frequent maintenance prophylaxis when immunosuppression is evident.

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epinephrine (epp-ih-NEFF-rin)

Adrenalin Chloride: Solution for injection: 1 mg/mL (1:1,000), 10 mg/mL (1:100) as hydrochloride
EpiPen: Solution: 1 mg/mL (1:1,000)
EpiPen Jr.: Solution: 0.5 mg/mL (1:2,000)
microNefrin, S2: Solution for inhalation: 2.25% racepinephrine hydrochloride
Primatene Mist: Aerosol: 0.22 mg epinephrine per spray

Adrenalin, Vaponefrin

Drug Class: Alpha agonist; Beta agonist

PHARMACOLOGY

Action

Stimulates alpha- and beta-receptors (alpha-receptors at high doses; $beta_1$- and $beta_2$-receptors at moderate doses) within sympathetic nervous system. Relaxes smooth muscle of bronchi and iris and is antagonist of histamine.

Uses

Treatment and prophylaxis of cardiac arrest and attacks of transitory AV heart block; treatment of Adams-Stokes syndrome; treatment of hay fever; relief of bronchial asthma; treatment of syncope caused by heart block or carotid sinus hypersensitivity; symptomatic relief of serum sickness, urticaria, and angioedema; relaxation of uterine musculature; anaphylaxis; allergic reactions (e.g., bronchospasm, urticaria, pruritus, angioneurotic edema, swelling of the lips, eyelids, tongue, and nasal mucosa) because of anaphylactic shock caused by stinging insects (primarily of the order *Hymenoptera*, which includes bees, wasps, hornets, yellow jackets, bumble bees, and fire ants); severe allergic or anaphylactoid reactions caused by allergy injections; exposures to pollens, dusts, molds, foods, drugs; exercise; unknown substances (so-called idiopathic anaphylaxis); severe, life-threatening asthma attacks characterized by wheezing, dyspnea, and inability to breathe.
NASAL SOLUTION: Treatment of nasal congestion; relief of eustachian tube congestion.
INHALATION: Temporary relief from acute paroxysms of bronchial asthma and other states; treatment of postintubation and infectious croup.

Contraindications

Hypersensitivity to epinephrine; narrow-angle glaucoma; concomitant use during general anesthesia with halogenated hydrocarbons or cyclopropane; cerebral arteriosclerosis or organic brain damage; use with anesthesia for fingers and toes; use during labor; phenothiazine-induced circulatory collapse; MAO inhibitor therapy; nonanaphylactic shock during general anesthesia with halogenated hydrocarbons or cyclopropane; organic heart disease; cardiac dilation and coronary insufficiency.

Usual Dosage

Allergic emergencies

ADULTS: *IM:* (Epipen) Usual dose is 0.3 mg.
CHILDREN: *IM:* (Epipen or Epipen Jr) 0.01 mg/kg is recommended.

Pharmacokinetics

ABSORP: Depends on dose form.
DIST: Depends on dose form.
METAB: Inactivated by enzymatic transformation to metanephrine or normetanephrine; these are subsequently conjugated and excreted in the urine.
EXCRET: Mostly excreted in urine as inactive metabolites; remainder excreted as unchanged drug or conjugated.
ONSET: 5 to 10 min (SC), 1 to 5 min (inhalation).
DURATION: 4 to 6 hr (SC), 1 to 4 hr (IM), 1 to 3 hr (inhalation).

DRUG INTERACTIONS

Antidepressants, tricyclic: Hypertension or hypertensive crisis (inhibition of norepinephrine uptake)
- Monitor clinical status.

Beta-adrenergic blockers: Decreased antianaphylactic effect (beta-blockade)
- Increased epinephrine may be required in anaphylaxis.

Cocaine: Ventricular arrhythmias (additive)
- Monitor clinical status.

Cyclopropane: Cardiac arrhythmias (mechanism unknown)
- Monitor clinical status.

Digoxin: Increased tendency to cardiac arrhythmias (additive)
- Monitor clinical status.

Entacapone: Tachycardia (mechanism unknown)
- Monitor clinical status.

Guanadrel: Decreased antihypertensive effect (blockade of guanadrel uptake at target site)
- Monitor clinical status.

Halothane: Possible fatal arrhythmias (additive)
- Monitor clinical status.

Midodrine: Risk of severe hypertension (additive)
- Monitor clinical status.

Pilocarpine: Increased myopia (mechanism unknown)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mucosa, taste disturbance (inhalation).
CVS: Cardiac arrhythmias and excessive hypertension; palpitations (especially in hyperthyroid and hypertensive patients); tachycardia; anginal pain in predisposed patients; cerebral and subarachnoid hemorrhage; flushing.
CNS: Anxiety; headache; restlessness; tremor; weakness; hemiplegia; dizziness; insomnia.
GI: Nausea; vomiting.
RESP: Shortness of breath.
MISC: Severe metabolic acidosis; pallor; urticaria; wheal and hemorrhage at site of injection; necrosis at injection site following repeated injections; sweating; transient elevations of blood glucose; elevated serum lactic acid.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse rate, respiratory rate and function); uncontrolled respiratory disease is characterized by wheezing and coughing.
- *Asthma:* Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Inhalants can dry oral mucosa; anticipate candidiasis, increased calculus and plaque levels, and increased caries.

When used by DDS:

- *Lactation:* Excreted in breast milk.
- *Children:* Administer drug with caution. Syncope has occurred in asthmatic children.
- *Special risk:* Use drug with caution in elderly patients and patients with CV disease, pulmonary edema, hypertension, hyperthyroidism, diabetes, psychoneurotic illness, asthma, prefibrillatory rhythm, or anesthetic cardiac accidents.
- *Sulfite sensitivity:* Some products contain sulfites; use drug with caution in sulfite-sensitive individuals.
- *Bronchial asthma/emphysema:* Administer with extreme caution to patients with long-standing bronchial asthma and emphysema who develop degenerative heart disease.
- *Cerebrovascular hemorrhage:* May result from overdosage or inadvertent IV injection.
- *Fatalities:* Death may result from pulmonary edema because of peripheral constriction and cardiac stimulation produced.
- *Pulmonary edema:* May cause fatalities because of peripheral constriction or cardiac stimulation.
- *Overdosage:* Precordial distress, vomiting, headache, shortness of breath, unusually elevated BP, cerebrovascular hemorrhage, pulmonary arterial hypertension, pulmonary edema, ventricular hyperirritability, bradycardia, tachycardia, arrhythmias, extreme pallor, cold skin, metabolic acidosis, kidney failure.

Pregnancy Risk Category: Category C.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

When used by DDS:

- In a life-threatening medical emergency, the use of epinephrine takes precedence over all other considerations.

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epoetin alfa (eh-POE-eh-tin AL-fuh)

Synonyms: erythropoietin; EPO

Epogen, Procrit

Eprex

Drug Class: Recombinant human erythropoietin

PHARMACOLOGY

Action

Stimulates red blood cell (RBC) production.

Uses

Treatment of anemia related to chronic renal failure, zidovudine therapy in HIV-infected patients and nonmyeloid malignancies. Reduction of allogeneic blood transfusions in surgery patients.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Headache; seizures; insomnia.
CVS: Hypertension (24%).

GI: Nausea (11%); vomiting; diarrhea; constipation; dyspepsia.
RESP: Shortness of breath; cough.
MISC: Allergy, including anaphylaxis, skin rashes, and urticaria; fever; paresthesia; arthralgia (11%); edema; pruritus; antibody-induced pure red cell aplasia (postmarketing).

CLINICAL IMPLICATIONS

General

- Drug used for variety of reasons. Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Malignancy:* Medical consultation to determine WBC and platelet count before invasive dental procedures, including periodontal debridement.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Recommend frequent maintenance prophylaxis when immunosuppression is evident.

eprosartan mesylate (eh-pro-SAHR-tan MES-il-ayt)

Teveten

Drug Class: Antihypertensive; Angiotensin II antagonist

PHARMACOLOGY

Action

Antagonizes the effect of angiotensin II (vasoconstriction and aldosterone secretion) by blocking the angiotensin II receptor (AT_1 receptor) in vascular smooth muscle and the adrenal gland, producing decreased BP.

Uses

Treatment of hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, gingivitis, periodontitis, toothache (<1%).
CNS: Fatigue; depression.
CVS: Chest pain; bradycardia; palpitations; hypotension; orthostatic hypotension.
GI: Abdominal pain.
RESP: URI; rhinitis; pharyngitis; coughing.
MISC: Arthralgia.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- If coughing is problematic, consider semisupine chair position for treatment.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

Oral Health Education
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

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ergotamine tartrate (ehr-GOT-ah-meen TAR-trate)

Ergomar

Ergocaf, Sydolil

Drug Class: Ergotamine derivatives

PHARMACOLOGY

Action
Reduces extracranial blood flow, causes decline in amplitude of pulsation in the cranial arteries, and decreases hyperperfusion of the territory of the basilar artery; produces constriction of both arteries and veins.

Uses
Abort or prevent vascular headache (e.g., migraine).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Ketoconazole or itraconazole: Increased vasospastic effects (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS
CVS: Tachycardia or bradycardia; pulselessness.

GI: Nausea; vomiting.

MISC: Weakness of legs; limb muscle pain; numbness and tingling of the fingers and toes; precordial pain; localized edema; itching.

CLINICAL IMPLICATIONS

General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse). Drugs for prevention are sympatholytic; drugs for treatment of acute attack are sympathomimetic.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education
- Evaluate manual dexterity; consider need for power toothbrush.

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erythromycin (eh-RITH-row-MY-sin)

A/T/S, Akne-mycin, Del-Mycin, E.E.S. 200, E.E.S. 400, E.E.S. Granules, E-Base, Emgel, E-Mycin, Eryc, Erycette, Eryderm, Erymax, EryPed, EryPed 200, EryPed 400, EryPed Drops, Ery-Tab, Erythra-Derm, Erythrocin Stearate, Ilosone, Ilotycin, Ilotycin Gluceptate, PCE Dispertab, Theramycin Z

Apo-Erythro Base, Apo-Erythro E-C, Apo-Erythro-ES, Apo-Erythro-S, E.E.S. 600, Erybid, Novorythro Encap, Nu-Erythromycin-S, PMS-Erythromycin

Eritroquim, Ilosone, Latotryd, Lauricin, Lauritran, Lederpax, Luritran, Optomicin, Pantomicina, Procephal, Tromigal

Drug Class: Antibiotic, macrolide

PHARMACOLOGY

Action

Interferes with microbial protein synthesis.

Uses

ORAL/IV: Treatment of infections of respiratory tract, skin and skin structure, and sexually transmitted diseases caused by susceptible organisms; treatment of pertussis, diphtheria, erythrasma, intestinal amebiasis, conjunctivitis of newborn, and Legionnaire disease; prevention of attacks of rheumatic fever; prevention of bacterial endocarditis.
OPHTHALMIC: Treatment of superficial ocular infections caused by strains of susceptible organism.
TOPICAL: Treatment of acne vulgaris.

Unlabeled Uses

Treatment of *Neisseria gonorrhoeae* in pregnancy; treatment of diarrhea caused by *Campylobacter jejuni*; as alternative to penicillin in selected infections, *Treponema pallidum, Lymphogranuloma venereum, Granuloma inguinale, Haemophilus ducreyi* (chancroid). Other uses as alternative to penicillins include the following: anthrax, Vincent gingivitis, erysipeloid, tetanus, actinomycosis, *Nocardia* infections (with a sulfonamide), *Eikenella corrodens* infections, *Borrelia* infections (including early Lyme disease).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Midazolam or triazolam: Increased midazolam or triazolam toxicity (decreased metabolism)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Candidiasis (high dosage, prolonged use).
CVS: Arrhythmia (rare).
GI: Diarrhea; nausea; vomiting abdominal pain/cramping.
RESP: Cough; dyspnea.
MISC: Venous irritation or phlebitis with IV administration; pseudomembranous colitis (rare).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- This drug lacks the spectrum to manage odontogenic infection and has a strong risk of causing antibiotic-resistant microbes to develop. See Chapter 4: *Medical Management of Odontogenic Infections*.
- Antibiotic-associated diarrhea can occur. If prescribed by DDS, have patient contact DDS immediately if signs develop.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.

Oral Health Education

- Inform patient that antibacterial drug regimens must be followed to completion.

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escitalopram oxalate (ESS-sigh-TAL-oh-pram OX-ah-late)

Lexapro

Drug Class: Antidepressant, selective serotonin reuptake inhibitor

PHARMACOLOGY

Action

Inhibits the CNS neuronal uptake of serotonin, potentiating serotonergic activity.

Uses

Treatment of major depressive disorders and generalized anxiety.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Tramadol: Increased risk of seizure (additive)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (9%); caries (3%); taste disturbance.

CNS: Headache (24%); insomnia (14%); somnolence (13%); decreased libido, dizziness (7%); decreased appetite, abnormal dreaming, lethargy (3%); paresthesia, yawning (2%); light-headedness, migraine, increased appetite, irritability, impaired concentration (≥1%); grand mal seizures.

CVS: Hot flushes, chest pain (≥1%); hypertension, palpitations.

GI: Nausea (18%); diarrhea (14%); constipation, indigestion (6%); vomiting (3%); abdominal pain, flatulence; heartburn, abdominal cramps, gastroenteritis (≥1%); GI hemorrhage, pancreatitis.

RESP: Sinusitis (2%); rhinitis (5%); bronchitis, congestion, coughing, sinus headache (≥1%).

MISC: Increased sweating (8%); influenza-like symptoms, fatigue (5%); allergy, fever; angioedema, neuroleptic malignant syndrome, serotonin syndrome.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care.

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esomeprazole magnesium (es-om-ME-pray-zol mag-NEE-zhum)

Nexium

Drug Class: Gastrointestinal; Proton pump inhibitor

PHARMACOLOGY

Action

Suppresses gastric acid secretion by blocking proton pump within gastric parietal cells.

Uses

Treatment of heartburn and other symptoms of gastroesophageal reflux disease (GERD); short-term treatment in healing and symptomatic resolution of erosive esophagitis; maintain symptom resolution and healing of erosive esophagitis; in combination with amoxicillin and clarithromycin for treatment of *Helicobacter pylori* infection and duodenal ulcer disease to eradicate *H. pylori*; reduction in occurrence of gastric ulcers associated with continuous NSAID therapy in patients at risk of developing gastric ulcers.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole or itraconazole: Possible decreased ketoconazole or itraconazole effect (decreased absorption)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Ulcerative stomatitis, tongue edema (<1%).
CNS: Headache (6%).
CVS: Hypertension, tachycardia (1%).
GI: Diarrhea (≥1%); nausea; flatulence; abdominal pain; constipation; pancreatitis.
MISC: Anaphylactic reaction.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If patient has GI disease, consider semisupine chair position.
- Anticipate chemical erosion of teeth.
- Substernal pain (heartburn) may mimic pain of cardiac origin.
- Monitor vital signs.

Oral Health Education

- Inform patient that toothbrushing should not be completed after reflux, but to only rinse with water, then use home fluoride product to minimize chemical erosion–related caries.

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estradiol (ESS-truh-DIE-ole)

(stradiol cypionate, estradiol valerate)

Alora, Climara, Delestrogen, Depo-Estradiol, Esclim, Estrace, Estraderm, Estrasorb, Estring, Gynodiol, Vivelle, Vivelle-Dot

Estraderm 25, Estradot

Climaderm, Estraderm TTS, Ginedisc, Oestrogel, Systen

Drug Class: Estrogens

PHARMACOLOGY

Action

Promotes growth and development of female reproductive system and secondary sex characteristics; affects release of pituitary gonadotropins; inhibits ovulation and prevents postpartum breast engorgement; conserves calcium and phosphorous and encourages bone formation; overrides stimulatory effects of testosterone.

Uses

Management of moderate to severe vasomotor symptoms associated with menopause, female hypogonadism, female castration, primary ovarian failure, postpartum breast engorgement, and atrophic conditions caused by deficient endogenous estrogen production; atrophic urethritis; palliative treatment of metastatic breast or prostate cancer in selected women and men; prevention and treatment of osteoporosis; abnormal uterine bleeding caused by hormonal imbalance in the absence of organic pathology and only when associated with a hypoplastic or atrophic endometrium.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Toothache; tooth disorder (unspecified).

CNS: Headache; migraine; dizziness; depression; insomnia; anxiety; emotional lability; chorea; nervousness; mood disturbance; irritability; somnolence; exacerbation of epilepsy.
CVS: Thromboembolism; syncope; hypertension.
GI: Nausea; vomiting; abdominal cramps; bloating; colitis; acute pancreatitis; diarrhea; dyspepsia; flatulence; gastritis; gastroenteritis; enlarged abdomen; hemorrhoids; increased incidence of gallbladder disease.
RESP: URI; sinusitis; rhinitis; pharyngitis; flu-like symptoms; allergy; bronchitis; chest pain.
MISC: Pain at injection site; redness and irritation at site of transdermal system; increase or decrease in weight; reduced carbohydrate tolerance; edema; breast tenderness; acute intermittent porphyria; vaginal bleeding; hypersensitivity reactions; back pain; arthritis; arthralgia; hot flushes; leg edema; otitis media; breast enlargement and pain; nipple discharge; galactorrhea; fibrocystic breast changes; increased triglycerides.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Inform patient who smokes about the risks of using tobacco products with estrogens.

---

estrogens, conjugated or esterified (ESS-truh-janz)

(conjugated estrogen, esterified estrogen)

Menest, Premarin, Premarin IV

C.E.S., Congest

Drug Class: Estrogens

PHARMACOLOGY

Action

Promotes growth and development of female reproductive system and secondary sex characteristics; affects release of pituitary gonadotropins; inhibits ovulation and prevents postpartum breast engorgement; conserves calcium and phosphorous and encourages bone formation; overrides stimulatory effects of testosterone.

Uses

Management of moderate to severe vasomotor symptoms associated with menopause; treatment of atrophic vaginitis, kraurosis vulvae, female hypogonadism, symptoms of female castration, and primary ovarian failure; prevention and treatment of osteoporosis (conjugated estrogens); palliative treatment of metastatic breast or prostate cancer in selected women and men; treatment of postpartum breast engorgement and abnormal uterine bleeding (parenteral form).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Toothache (unspecified).
CNS: Headache; migraine; dizziness; depression; anxiety; emotional lability.
CVS: Thromboembolism, syncope, hypertension.
GI: Nausea; vomiting; abdominal cramps; bloating; colitis; acute pancreatitis; diarrhea; dyspepsia; flatulence; gastritis; gastroenteritis; enlarged abdomen; hemorrhoids.
RESP: URI; sinusitis; rhinitis; pharyngitis; flu-like symptoms; allergy; bronchitis; chest pain.
MISC: Increase or decrease in weight; reduced glucose tolerance; edema; changes in libido; breast tenderness; acute intermittent porphyria; vaginal bleeding; hypersensitivity reactions; back pain; arthritis; arthralgia; hot flushes; leg edema; otitis media.

CLINICAL IMPLICATIONS

General

- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Inform patient about the risks of using tobacco products during estrogen therapy.

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estrogens, conjugated/medroxyprogesterone acetate (ESS-truh-janz, KAHN-juh-gay-tuhd/meh-DROX-ee-pro-JESS-tuh-rone ASS-uh-TATE)

Synonyms: conjugated estrogens/medroxyprogesterone acetate; medroxyprogesterone acetate/conjugated estrogens

Premphase, Prempro

Drug Class: Sex hormones

PHARMACOLOGY

Action

Conjugated estrogens: promotes growth and development of female reproductive system and secondary sex characteristics; affects release of pituitary gonadotropins; inhibits ovulation and prevents postpartum breast engorgement; conserves calcium and phosphorous and encourages bone formation; overrides stimulatory effects of testosterone; progesterone: inhibits secretion of pituitary gonadotropins, thereby preventing follicular maturation and ovulation (contraceptive effect); inhibits spontaneous uterine contraction; transforms proliferative endometrium into secretory endometrium.

Uses

Treatment of moderate to severe vasomotor symptoms associated with menopause; treatment of vulval and vaginal atrophy; osteoporosis prevention.

Unlabeled Uses

Treatment of hypercholesterolemia in postmenopausal women.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Tooth disorder (unspecified).

CNS: Headache; depression; dizziness; hypertonia; nervousness; migraine; chorea; insomnia; somnolence; change in libido.

CVS: Thromboembolism, hypertension.

GI: Abdominal pain and cramps; diarrhea; dyspepsia; flatulence; nausea; changes in appetite; vomiting; bloating.

MISC: Accidental injury; back pain; flu-like syndrome; infection; pain; pelvic pain; arthralgia; leg cramps; gallbladder disease; pancreatitis; fatigue; aggravation of porphyria; anaphylactoid reaction; anaphylaxis.

CLINICAL IMPLICATIONS

General

- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Inform patient about the risks of using tobacco products during estrogen therapy.

estrogens, synthetic conjugated, a or b (ESS-truh-janz, sin-THE-tik KAHN-juh-gay-tuhd)

Synonym: synthetic conjugated estrogens

Cenestin, Enjuvia

Drug Class: Estrogens

PHARMACOLOGY

Action

Estrogens are responsible for the development and maintenance of the female reproductive system and secondary sexual characteristics. Circulating estrogens modulate the pituitary secretion of the gonadotropins luteinizing hormone (LH) and follicle-stimulating hormone (FSH) through a negative feedback mechanism and estrogen-replacement therapy acts to reduce the elevated levels of these hormones seen in postmenopausal women.

Uses

Treatment of moderate to severe symptoms associated with menopause (synthetic conjugated estrogens, A or B); vulvar and vaginal atrophy (synthetic conjugated estrogens, A only).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Tooth disorder (unspecified).
CNS: Depression; dizziness; hypertonia; insomnia; nervousness; paresthesia; vertigo; headache; asthenia.
CVS: Thromboembolism; increased blood pressure.
GI: Abdominal pain; constipation; diarrhea; dyspepsia; flatulence; nausea; vomiting.
RESP: Cough; pharyngitis; rhinitis; bronchitis; sinusitis.
MISC: Back pain; fever; infection; pain; accidental injury; flu-like syndrome; leg cramps.

CLINICAL IMPLICATIONS

General

- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Inform patient about the risks of using tobacco products during estrogen therapy.

estropipate (ESS-troe-PIH-pate)

Synonym: piperazine estrone sulfate

Ogen, Ortho-Est

Drug Class: Estrogens

PHARMACOLOGY

Action

Promotes growth and development of female reproductive system and secondary sex characteristics; affects release of ovulation and prevents postpartum breast engorgement; conserves calcium and phosphorous and encourages bone formation; overrides stimulatory effects of testosterone.

Uses

Management of moderate to severe vasomotor symptoms associated with menopause; female hypogonadism, female castration, primary ovarian failure, and atrophic conditions

caused by deficient endogenous estrogen production; prevention and treatment of osteoporosis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Toothache (unspecified).

CNS: Headache; migraine; dizziness; depression; insomnia; anxiety; emotional lability.

CVS: Thromboembolism; hypertension.

GI: Nausea; vomiting; abdominal cramps; bloating; colitis; acute pancreatitis; diarrhea; dyspepsia; flatulence; gastritis; gastroenteritis; enlarged abdomen; hemorrhoids.

RESP: URI; sinusitis; rhinitis; pharyngitis; flu-like symptoms; allergy; bronchitis; chest pain.

MISC: Increase or decrease in weight; edema; changes in libido; breast tenderness; acute intermittent porphyria; vaginal bleeding; hypersensitivity reactions; back pain; arthritis; arthralgia; hot flushes; otitis media.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Inform patient about the risks of using tobacco products during estrogen therapy.

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eszopiclone (es-zoe-PIK-lone)

Lunesta

Drug Class: Sedative; Hypnotic

PHARMACOLOGY

Action

Precise mechanism is unknown; however, binding with GABA-receptor complexes located close to or allosterically coupled to benzodiazepine receptors is suspected.

Uses

Treatment of insomnia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Clarithromycin: Possible increased eszopiclone toxicity (decreased metabolism)

- Avoid concurrent use.

Ketoconazole or itraconazole: Possible increased eszopiclone toxicity (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (7%); unpleasant taste (34%).

CNS: Headache (21%); somnolence (10%); dizziness (7%); nervousness (5%); depression (4%); anxiety, confusion, hallucinations, decreased libido, abnormal dreams, neuralgia (3%); migraine (≥1%).

GI: Dyspepsia, nausea (5%); diarrhea (4%); vomiting (3%).

RESP: Respiratory infection (10%).

MISC: Pain (5%); accidental injury, viral infection (3%); chest pain, peripheral edema (≥1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Use benzodiazepines with caution; risk of drug abuse and dependence.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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etanercept (EE-tan-err-sept)

Enbrel

Drug Class: Immunomodulator

PHARMACOLOGY

Action

Binds specifically to tumor necrosis factor (TNF), blocks its interaction with cell surface TNF receptors, and modulates biological responses that are induced or regulated by TNF.

Uses

Reducing signs and symptoms and inhibiting the progression of structural damage in moderately to severely active rheumatoid arthritis; reducing signs and symptoms of moderately to severely active polyarticular-course juvenile rheumatoid arthritis (JRA) in patients responding inadequately to one or more disease-modifying antirheumatic drugs; reducing signs and symptoms of psoriatic arthritis; reducing signs and symptoms in patients with active ankylosing spondylitis. May be used in combination with methotrexate (MTX) in patients who do not respond adequately to MTX alone in the treatment of rheumatoid or psoriatic arthritis.

Unlabeled Uses

Psoriasis; treatment of Wegener granulomatosis (orphan status).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Mouth ulcers (6%); altered taste, dry mouth.

CNS: Headache (24%); dizziness (8%); hydrocephalus; seizure; stroke; cerebral ischemia; multiple sclerosis; depression.

JRA Patients: Personality disorder; aseptic meningitis; paresthesias; isolated demyelinating conditions (e.g., transverse myelitis, optic neuritis).

CVS: Thrombophlebitis; hypertension; hypotension.

GI: Nausea (15%); dyspepsia (11%); abdominal pain (10%); vomiting (5%); GI bleeding; cholecystitis; pancreatitis; GI hemorrhage.

JRA Patients: Gastroenteritis; esophagitis/gastritis.

Postmarketing: Anorexia; diarrhea; intestinal perforation.

RESP: Upper respiratory tract infections (31%); cough (6%); respiratory disorder (5%); pulmonary embolism; dyspnea.

Postmarketing: Interstitial lung disease; pulmonary disease; worsening of prior lung disorder.

MISC: Non–upper respiratory tract infections (51%); asthenia (11%); peripheral edema (8%).

JRA Patients: Group A streptococcal septic shock; soft tissue and postoperative wound infection; varicella infection.

POSTMARKETING IN PEDIATRIC PATIENTS: Abscess with bacteremia; tuberculous arthritis.
POSTMARKETING: Angioedema; fatigue; fever; flu-like symptoms; generalized pain; sepsis; death.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If hands are affected, consider recommendation of powered devices for plaque control.
- Recommend frequent maintenance prophylaxis when immunosuppression is evident.

ethacrynic acid (eth-uh-KRIN-ik ASS-id)

Synonym: ethacrynate

Edecrin, Edecrin Sodium

Drug Class: Loop diuretic

PHARMACOLOGY

Action

Inhibits reabsorption of sodium and chloride in proximal and distal tubules and in loop of Henle.

Uses

Treatment of edema associated with CHF, cirrhosis, or renal disease; treatment of ascites, congenital heart disease, nephrotic syndrome.

Unlabeled Uses

Treatment of glaucoma; treatment of nephrogenic diabetes insipidus, hypercalcemia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Apprehension; confusion; fatigue; malaise; vertigo; headache; dysphagia.
GI: Anorexia; nausea; vomiting; diarrhea; pancreatitis; discomfort; pain; sudden watery, profuse diarrhea; bleeding.
MISC: Fever; chills; severe neutropenia, thrombocytopenia, agranulocytosis.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Monitor pulse rhythm to assess for electrolyte imbalance.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

ethambutol HCl (eth-AM-byoo-tahl HIGH-droe-KLOR-ide)

Myambutol

Drug Class: Anti-infective; Antitubercular

PHARMACOLOGY

Action

Inhibits synthesis of one or more metabolites, causing impairment of cell metabolism, arrest of multiplication, and cell death.

Uses

Treatment of pulmonary tuberculosis in combination with one or more other antituberculous agents.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Malaise; headache; dizziness; mental confusion; disorientation; possible hallucinations; numbness and tingling of extremities.
GI: Anorexia; nausea; vomiting; GI upset; abdominal pain.
RESP: Pulmonary infiltrates.
MISC: Hypersensitivity (e.g., anaphylactoid reactions, dermatitis, pruritus); fever; joint pain.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken (prevention or treatment). Consider implications of condition on dental treatment.
- Complete medical consult to ensure noninfectious state exists before providing dental treatment.
- *For dental emergencies:* Follow special precautions to minimize disease transmission (particulate respirators) or refer patient to a hospital-based dental facility.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.

ethionamide (eh-THIGH-ohn-ah-mide)

Trecator-SC, Trecator

Drug Class: Anti-infective; Antitubercular

PHARMACOLOGY

Action

Inhibition of peptide synthesis in susceptible organisms is suspected.

Uses

Treatment of tuberculosis, in combination with other agents, in patients with *Mycobacterium tuberculosis* resistant to isoniazid or rifampin, or when there is intolerance to other antituberculous agents.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Excessive salivation; metallic taste; stomatitis.
CNS: Psychotic disturbances; depression; drowsiness; dizziness; headache; restlessness; peripheral neuritis.

CVS: Postural hypotension.
GI: Nausea; vomiting; diarrhea; abdominal pain; anorexia.
MISC: Photosensitivity; pellagra-like syndrome.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken (prevention or treatment). Consider implications of condition on dental treatment.
- Complete medical consult to ensure noninfectious state exists before providing dental treatment.
- *For dental emergencies:* Follow special precautions to minimize disease transmission (particulate respirators) or refer patient to a hospital-based dental facility.
- If GI side effects occur, consider semisupine chair position.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

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ethosuximide (ETH-oh-SUX-ih-mide)

Zarontin

Drug Class: Anticonvulsant, succinimide

PHARMACOLOGY

Action

Elevates seizure threshold and suppresses paroxysmal spike and wave activity associated with lapses of consciousness common in absence (petit mal) seizures.

Uses

Control of absence (petit mal) seizures.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Gingival enlargement; tongue swelling.
CNS: Drowsiness; headache; dizziness; euphoria; hiccups; irritability; hyperactivity; lethargy; fatigue; ataxia; psychological disturbances (e.g., sleep disorders, night terrors, poor concentration, aggressiveness).
MISC: Blood dyscrasias (e.g., leukopenia, agranulocytosis, eosinophilia); erythema multiforme, Stevens-Johnson syndrome, photophobia.
GI: Anorexia; GI upset; nausea; vomiting; cramps; epigastric and abdominal pain; weight loss (common).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine level of disease control, type and frequency of seizure, and compliance with medication regimen.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- If GI side effects occur, consider semisupine chair position.
- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

etidronate disodium (eh-TIH-DROE-nate die-SO-dee-uhm)

Didronel

Didronel

Drug Class: Bisphosphonate

PHARMACOLOGY

Action

Inhibits normal and abnormal bone resorption; reduces bone formation.

Uses

Treatment of symptomatic Paget disease; prevention and treatment of heterotopic ossification following total hip replacement or caused by spinal cord injury.

Unlabeled Uses

Treatment of corticosteroid-induced osteoporosis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Taste perversion; glossitis.

CNS: Amnesia, confusion, depression, hallucination, headache, paresthesias (postmarketing).

GI: Diarrhea; nausea; diarrhea in enterocolitis patients; esophagitis, gastritis, exacerbation of peptic ulcer disease, perforation of peptic ulcer (postmarketing).

RESP: Exacerbation of asthma (postmarketing).

MISC: Hypersensitivity (e.g., angioedema, urticaria, rash, pruritus); increased or recurrent bone pain in Paget disease; hypocalcemia; nephrotic syndrome and fractures with excessive doses; hyperphosphatemia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Patients may be high-risk candidates for pathological fractures or jaw fractures during extractions.
- This drug is used for Paget disease. Be aware of the head and neck manifestations (e.g., macrognathia, alveolar pain, bone warm to touch).
- If GI side effects or back pain occurs, consider semisupine chair position.
- This bisphosphonate is not associated with osteonecrosis of the jaw.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.

etodolac (EE-toe-DOE-lak)

Apo-Etodolac, Ultradol

Retard

Drug Class: Analgesic; NSAID

PHARMACOLOGY

Action

Decreases inflammation, pain, and fever, probably through inhibition of COX activity and prostaglandin synthesis.

Uses
Management of pain (Lodine only); management of signs and symptoms of osteoarthritis and rheumatoid arthritis.

Unlabeled Uses
Control of symptoms of rheumatoid arthritis; treatment of temporal arteritis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth, stomatitis, taste disturbance (1%).
CNS: Dizziness; headaches; drowsiness; insomnia; asthenia; malaise; depression; nervousness.
GI: Dyspepsia; nausea; vomiting; diarrhea; indigestion; heartburn; abdominal pain; constipation; flatulence; gastritis; melena; anorexia; peptic ulcers.
RESP: Asthma.
MISC: Chills; fever.

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Arthritis:* Consider patient comfort and need for semisupine chair position.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education
- Evaluate manual dexterity; consider need for power toothbrush.

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etonogestrel (e-toe-noe-JES-trel)
Implanon

Drug Class: Contraceptive hormone

PHARMACOLOGY
Action
Suppresses ovulation, increases viscosity of the cervical mucus, and alters the endometrium.

Uses
Prevention of pregnancy.

Unlabeled Uses
Male contraceptive agent.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
CVS: Hypertension, migraine, varicose vein (less than 5%).
CNS: Headache (25%); dizziness (7%); depression, emotional lability, nervousness (6%); abnormal crying, anxiety, asthenia, decreased libido, fatigue, hypoesthesia, insomnia, somnolence (less than 5%).
GI: Abdominal pain (11%); nausea (6%); anorexia, constipation, diarrhea, dyspepsia, flatulence, gastritis, vomiting (less than 5%).
RESP: Upper respiratory tract infection (13%); sinusitis (6%); asthma, coughing (less than 5%).
MISC: Influenza-like symptoms (8%); pain (6%); allergic reaction, edema, fever, generalized edema, hot flushes, increased appetite (less than 5%).

CLINICAL IMPLICATIONS

General

- Monitor vital signs.
- *Women:* If antiinfective therapy is needed for oral infection, recommend additional birth control method.

Oral Health Education

- *Smoking:* Inform patient who smokes tobacco of the adverse effect that using tobacco has on preterm birth.

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exenatide (ex-EN-a-tide)

Byetta

Drug Class: Antidiabetic agent, Incretin mimetic agent

PHARMACOLOGY

Action

Incretin mimetic that mimics antihyperglycemic actions of incretins, including enhancing glucose-dependent insulin secretion, suppressing inappropriately elevated glucagon secretion, slowing gastric emptying, and reducing food intake.

Uses

Adjunctive therapy to improve glycemic control in patients with type 2 diabetes mellitus who are taking metformin, a sulfonylurea, or a combination of metformin and a sulfonylurea but have not achieved adequate glycemic control.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Acetaminophen: Decreased effectiveness of acetaminophen (decreased absorption)

- Acetaminophen should be taken at least 1 hour before or 2 hours after exenatide.

ADVERSE EFFECTS

CNS: Dizziness, feeling of jitteriness, headache (at least 5%); asthenia, decreased appetite (less than 5%).

GI: Diarrhea, dyspepsia, nausea, vomiting (at least 5%); gastroesophageal reflux disease (less than 5%).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin and Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Ensure patient has taken medication and eaten meal.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated; however, doxycycline therapy in poorly controlled patients with diabetes has been shown to improve disease control in the short term and improve response following periodontal debridement.
- Monitor blood pressure, as hypertension and dyslipidemia (CAD) are prevalent in diabetes mellitus.

- Medical consult advised if fasting blood sugar is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- Observe for signs of hypoglycemia (confusion, argumentative, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- If insulin is used, consider time of peak hypoglycemic effect.
- If GI side effects occur, consider semisupine chair position.
- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.
- Encourage patient to follow daily plaque control procedures to reduce risk for oral inflammation.

ezetimibe (Ezz-ET-ih-mibe)

Zetia

Drug Class: Antihyperlipidemic

PHARMACOLOGY

Action

Inhibits absorption of cholesterol by the small intestine.

Uses

Administration alone or with HMG-CoA reductase inhibitors as adjunctive therapy to diet for reduction of elevated total cholesterol, LDL, and apolipoprotein in patients with primary hypercholesterolemia; with atorvastatin or simvastatin for the reduction of elevated total cholesterol and LDL levels in patients with homozygous familial hypercholesterolemia as an adjunct to other lipid-lowering treatments or if such treatments are unavailable; as adjunctive therapy to diet for the reduction of elevated sitosterol and campesterol levels in patients with homozygous familial sitosterolemia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Fatigue; headache; dizziness.
GI: Diarrhea; abdominal pain.
RESP: Coughing; URI.
MISC: Back pain; arthralgia; viral infection; myalgia; chest pain.

CLINICAL IMPLICATIONS

General

- High LDL cholesterol concentration is the major cause of atherosclerosis, which leads to CAD (angina, MI); determine degree of CV health and ability to withstand stress of dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Consider semisupine chair position for patient comfort.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

famciclovir (fam-SYE-kloe-veer)

Famvir: Tablets: 125, 250, 500 mg

Drug Class: Anti-infective; Antiviral

PHARMACOLOGY

Action

Converts to penciclovir, which inhibits viral DNA replication by interfering with viral DNA polymerase.

Uses

Treatment of acute herpes zoster infection; treatment or suppression of recurrent genital herpes infection in immunocompetent patients; treatment of recurrent mucocutaneous herpes simplex infections in HIV-infected patients.

Contraindications

Hypersensitivity to famciclovir, other components of the formulation, or penciclovir cream.

Usual Dosage

Herpes zoster

ADULTS: *PO:* 500 mg q 8 hr for 7 days. Initiate treatment immediately after diagnosis.

HIV-infected patients

ADULTS: RECURRENT OROLABIAL OR GENITAL HERPES: *PO:* 500 mg bid for 7 days.

Pharmacokinetics

ABSORP: Bioavailability is about 77%. T_{max} is 0.9 hr. $AUC_{0-\infty}$ is 2.24 to 8.95 depending on dose. C_{max} is 0.8 to 3.3 mcg/mL depending on the dose.

DIST: Vd is about 1.08 L/kg; 20% bound to plasma proteins.

METAB: Hepatic route; deacetylated and oxidized to form inactive penciclovir metabolites.

EXCRET: Cl is about 36.6 L/hr; about 75% is renally cleared. The $t_{1/2}$ is about 2 to 3 hr.

SPECIAL POP: *Renal failure:* With Ccr 40 to 59 mL/min, Cl_R is about 13 L/hr and $t_{1/2}$ is about 3.4 hr. With Ccr 20 to 39 mL/min, Cl_R is about 4.24 L/hr and $t_{1/2}$ is about 6.2 hr. With Ccr less than 20 mL/min, Cl_R is about 1.64 L/hr and $t_{1/2}$ is about 13.4 hr. *Hepatic failure:* Penciclovir C_{max} decreased 44%; T_{max} increased by 0.75 hr.

DRUG INTERACTIONS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Headache (39%); paresthesia, migraine (3%); confusion; delirium; disorientation; confusional state.

GI: Nausea (13%); diarrhea (9%); abdominal pain (8%); vomiting, flatulence (5%).

MISC: Fatigue (5%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- If GI side effects occur, consider semisupine chair position.

When used or prescribed by DDS:

- Ensure patient knows how to take the drug, how long it should be taken, and to report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset immediately). See Chapter 4: *Medical Management of Odontogenic Infections*.
- *Lactation:* Undetermined.

- *Children:* Safety and efficacy not established.
- *Renal failure:* Dosage adjustment is recommended when Ccr is 60 mL/min or less.

Pregnancy Risk Category: Category B.

Oral Health Education

When prescribed by DDS:

- Explain name, dose, action, and potential side effects of drug.
- Review dose and appropriate dosing schedule depending on condition being treated (e.g., shingles, cold sores, recurrent herpes). Instruct patient to take medication exactly as prescribed and not to stop taking or change the dose unless advised by health care provider.
- Advise patient that medication can be taken without regard to meals but to take with food if stomach upset occurs.
- Remind patient using medication for recurrent episodes of herpes to initiate therapy at the first sign or symptom of recurrence and that medication may not be effective if started more than 6 hr after onset of signs or symptoms of recurrence.
- Advise patient with herpes that this drug is not a cure for herpes and does not prevent transmission of virus.
- Advise patient to contact health care provider if medication does not seem to be controlling lesions and/or symptoms or if intolerable side effects develop.
- Advise women to notify health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Instruct patient to not take any prescription or OTC medications or dietary supplements unless advised by health care provider.
- Advise patient that follow-up visits may be necessary to monitor therapy and to keep appointments.

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famotidine (fuh-MOE-tih-deen)

Pepcid, Pepcid AC, Pepcid AC, Pepcid AC, Pepcid RPD

Apo-Famotidine, Gen-Famotidine, Novo-Famotidine, Nu-Famotidine, Pepcid IV, ratio-Famotidine, Rhoxal-famotidine

Durater, Famoxal, Farmotex, Pepcidine, Sigafam

Drug Class: Histamine H_2 antagonist

PHARMACOLOGY

Action

Reversibly and competitively blocks histamine at H_2 receptors, particularly those in gastric parietal cells, leading to inhibition of gastric acid secretion.

Uses

Short-term treatment and maintenance therapy for duodenal ulcer, GERD (including erosive or ulcerative disease), benign gastric ulcer, treatment of pathological hypersecretory conditions.

Unlabeled Uses

Treatment of upper GI bleeding; prevention of stress ulcers; before anesthesia for prevention of pulmonary aspiration of gastric acid.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Naproxen: Possible decreased naproxen effect (decreased absorption)

- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disorder.

CNS: Headache; somnolence; fatigue; dizziness; confusion; hallucinations; agitation or anxiety; depression; insomnia; paresthesias.

CVS: Palpitations.
GI: Diarrhea; constipation; nausea; vomiting; abdominal discomfort; anorexia.
RESP: Bronchospasm.
MISC: Arthralgia; thrombocytopenia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If patient has GI disease, consider semisupine chair position.
- Use COX inhibitors with caution, they may exacerbate PUD and GERD.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Blood dyscrasias rarely reported; anticipate increased bleeding.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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felbamate (FELL-buh-mate)

Felbatol

Drug Class: Anticonvulsant

PHARMACOLOGY

Action

May reduce seizure spread in generalized tonic-clonic or partial seizures and may increase seizure threshold in absence seizures.

Uses

Monotherapy or adjunctive therapy in treatment of partial seizures with and without generalization in epileptic adults. Adjunctive therapy in treatment of partial and generalized seizures associated with Lennox-Gastaut syndrome in children.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (2.6%); taste perversion.
CNS: Insomnia; headache; anxiety; somnolence; dizziness; nervousness; tremor; abnormal gait; depression; paresthesia; ataxia; stupor; thinking abnormalities; emotional lability.
CVS: Chest pain, tachycardia, palpitations (1%).
GI: Dyspepsia; vomiting; constipation; diarrhea; nausea; anorexia; abdominal pain; hiccups.
RESP: URI; coughing.
MISC: Fatigue; weight decrease; facial edema; fever; pain; hypophosphatemia; myalgia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine level of disease control, type and frequency of seizure, and compliance with medication regimen.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

felodipine (feh-LOW-dih-peen)

Plendil

Renedil

Logimax, Munobal

Drug Class: Calcium channel blocker

PHARMACOLOGY

Action

Inhibits movement of calcium ions across cell membrane in systemic and coronary vascular smooth muscle, altering contractile process.

Uses

Treatment of hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Itraconazole: Possible felodipine toxicity (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; thirst; gingival hyperplasia.

CNS: Headache; dizziness; lightheadedness; nervousness; psychiatric disturbances; paresthesias; somnolence; asthenia; insomnia; anxiety; irritability.

CVS: Arrhythmia, chest pain, hypotension, tachycardia, palpitations, syncope.

GI: Nausea; diarrhea; constipation; abdominal discomfort; cramps; dyspepsia; vomiting; flatulence.

RESP: Nasal or chest congestion; sinusitis; rhinitis; pharyngitis; shortness of breath; wheezing; cough; sneezing; respiratory infections.

MISC: Muscle cramps, pain, or inflammation.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Consider semisupine chair position to assist respiratory function.
- Anticipate gingival hyperplasia; consider MD consult to recommend different drug regimen if periodontal health is compromised.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

fenofibrate (FEN-oh-fih-brate)

Lofibra, Tricor, Triglide

Apo-Fenofibrate, Apo-Feno-Micro, Gen-Fenofibrate Micro, Lipidil Micro, Lipidil Supra, Nu-Fenofibrate, PMS-Fenofibrate Micro

Controlip, Lipidil

Drug Class: Antihyperlipidemic

PHARMACOLOGY

Action

Mechanism not well established. Apparently decreases plasma levels of triglycerides by decreasing their synthesis. Also reduces plasma levels of VLDL cholesterol by reducing their release into the circulation and increasing catabolism. Reduces serum uric acid levels by increasing urinary excretion of uric acid.

Uses

Adjunctive therapy to diet for treatment of hypertriglyceridemia in adult patients with type 4 or 5 hyperlipidemia who are at risk of pancreatitis; adjunctive therapy to diet for the reduction of LDL cholesterol, total cholesterol, triglycerides, and apo B, and to increase HDL cholesterol in adults with primary hypercholesterolemia or mixed dyslipidemia (Fredrickson types IIa and IIb).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Tooth disorder (unspecified).
CNS: Dizziness; insomnia; paresthesia; headache; fatigue; asthenia.
CVS: Angina; hypertension or hypotension; palpitations; tachycardia; arrhythmia.
GI: Dyspepsia; nausea; vomiting; diarrhea; constipation; abdominal pain; flatulence; eructation; increased appetite; pancreatitis.
RESP: Rhinitis; sinusitis; cough; respiratory disorder.
MISC: Flu syndrome; arthralgia; back pain; hypersensitivity reactions (including severe skin rashes, Stevens-Johnson syndrome, toxic epidermal necrolysis); myositis; myopathy; rhabdomyolysis; photosensitivity disorder.

CLINICAL IMPLICATIONS

General

- High LDL cholesterol concentration is the major cause of atherosclerosis, which leads to CAD (angina, MI); determine degree of CV health and ability to withstand stress of dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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fenoprofen calcium (FEN-oh-PRO-fen KAL-see-uhm)

Nalfon Pulvules

Drug Class: Analgesic; NSAID

PHARMACOLOGY

Action

Decreases inflammation, pain and fever, probably through inhibition of cyclooxygenase activity and prostaglandin synthesis.

Uses

Symptomatic relief for rheumatoid arthritis, osteoarthritis, mild to moderate pain.

Unlabeled Uses

Symptomatic relief for juvenile rheumatoid arthritis; migraine prophylaxis and treatment.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions significant to dentistry. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (1%).
CNS: Dizziness; drowsiness; headaches; nervousness; anxiety; confusion; somnolence.
CVS: Palpitations; tachycardia.
GI: Heartburn; dyspepsia; nausea; vomiting; diarrhea; constipation; increased or decreased appetite; indigestion; GI bleeding; ulceration; abdominal distress/cramps/pain; flatulence; occult blood in stool.
RESP: Bronchospasm; laryngeal edema; hemoptysis; shortness of breath.
MISC: Agranulocytosis, thrombocytopenia, hemolytic anemia, aplastic anemia (<1%).

F

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Arthritis:* Consider patient comfort and need for semisupine chair position.
- Monitor vital signs.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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fentanyl transdermal system (FEN-tuh-nill)

Duragesic-25, Duragesic-50, Duragesic-75, Duragesic-100

Duragesic

Durogesic, Fentanest

Drug Class: Narcotic analgesic

PHARMACOLOGY

Action

A potent, short-acting, rapid-onset opiate agonist that relieves pain by stimulating opiate receptors in CNS.

Uses

Management of chronic pain refractory to less potent agents.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole: Fentanyl toxicity (decreased metabolism)
- Monitor clinical status.

Midazoleme: Hypoxemia and apnea (decreased sympathetic tone)
- Monitor clinical status.

Lidocaine: Possible CNS and respiratory depression (additive)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.
CNS: Lightheadedness; dizziness; sedation; disorientation; incoordination; headache; hallucinations; euphoria; depression; seizures.

CVS: Orthostatic hypotension.
GI: Nausea; vomiting; constipation; abdominal pain; diarrhea; dyspepsia.
RESP: Laryngospasm; depression of cough reflex; dyspnea; hypoventilation.
MISC: Tolerance; psychological and physical dependence with long-term use.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If oral pain requires additional analgesics, consider nonopioid products.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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ferrous salts (FER-uhs salts)

Fe^{50}, Femiron, Feosol, Feratab, Fer-gen-sol, Fergon, Fer-In-Sol, Fer-Iron, Ferrex 150, Ferro-Sequels, Hemocyte, Icar, Ircon, Nephro-Fer, Niferex, Niferex-150, Nu-Iron, Nu-Iron 150, Slow-FE, Vitron-C, ED-IN-SOL, DexFerrum

Apo-Ferrous Sulfate, Ferodan, Palafer

Ferval

Drug Class: Iron product

PHARMACOLOGY

Action

Iron is a major factor in oxygen transport and an essential mineral component of hemoglobin, myoglobin, and several enzymes.

Uses

Prevention and treatment of iron-deficiency anemia.

Unlabeled Uses

Use with epoetin to ensure hematological response to epoetin.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Tetracyclines: Decreased tetracycline effect and decreased iron effect (decreased absorption)

- Give iron 3 hr before or 2 hr after tetracycline.
- Doxycycline does not appear to interact.

ADVERSE EFFECTS

⚠ **ORAL:** Teeth staining with liquid formulation.
GI: Irritation; anorexia; nausea; vomiting; diarrhea; constipation; dark stool.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Anemia can result in poor wound healing.

fexofenadine HCl (fex-oh-FEN-ah-deen HIGH-droe-KLOR-ide)

Allegra

Allegra 12 Hour, Allegra 24 Hour

Drug Class: Antihistamine

PHARMACOLOGY

Action

Competitively antagonizes histamine at the H_1-receptor site.

Uses

Symptomatic relief of symptoms (nasal and nonnasal) associated with seasonal allergic rhinitis; treatment of uncomplicated skin manifestations of chronic idiopathic urticaria.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Headache (11%); drowsiness, dizziness (2%); fatigue (1%).
GI: Nausea (2%); dyspepsia (1%).
RESP: URI (4%).
MISC: Viral infection (cold, flu); accidental injury, back pain (3%); fever, pain (2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider semisupine chair position to control effects of postnasal drainage.
- Be aware that patients with multiple allergies are at increased risk for allergy to dental drugs.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

fexofenadine HCl/pseudoephedrine HCl (fex-oh-FEN-ah-deen HIGH-droe-KLOR-ide/SUE-doe-eh-FED-rin HIGH-droe-KLOR-ide)

Synonym: pseudoephedrine HCl/fexofenadine HCl

Allegra-D

Drug Class: Antihistamine, decongestant

PHARMACOLOGY

Action

FEXOFENADINE: Competitively antagonizes histamine at the H_1-receptor site.
PSEUDOEPHEDRINE: Causes vasoconstriction and subsequent shrinkage of nasal mucous membranes by alpha-adrenergic stimulation, promoting nasal drainage.

Uses

Relief of symptoms associated with seasonal allergic rhinitis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Headache; insomnia; dizziness; agitation; nervousness; anxiety; excitability, restlessness, weakness, drowsiness, fear, tenseness, hallucinations, seizures (pseudoephedrine).

GI: Nausea; dyspepsia; abdominal pain.

RESP: URI; respiratory difficulties.

MISC: Back pain.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider semisupine chair position to control effects of postnasal drainage.
- Be aware that patients with multiple allergies are at increased risk for allergy to dental drugs.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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finasteride (fih-NASS-teer-IDE)

Propecia, Proscar

Propeshia

Drug Class: Androgen hormone inhibitor

PHARMACOLOGY

Action

Inhibits conversion of testosterone into 5-alpha-dihydrotestosterone, a potent androgen.

Uses

PROPECIA: Treatment of male pattern hair loss (androgenic alopecia) in men only.

PROSCAR: Treatment of symptomatic BPH in men with enlarged prostate; in combination with doxazosin to reduce the risk of symptomatic progression of BPH.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: PROPECIA: Decreased libido (2%).
PROSCAR: Decreased libido (10%); dizziness (7%); headache, somnolence (2%).

CVS: PROSCAR: Postural hypotension (9%); hypotension.

RESP: PROSCAR: Rhinitis (1%).

MISC: PROSCAR: Asthenia (5%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

flavoxate (flay-voke-sate)

Urispas

Bladuril

Drug Class: Urinary tract antispasmodic; Alkalinizer

PHARMACOLOGY

Action

Counteracts smooth muscle spasms of urinary tract.

Uses

Symptomatic relief of dysuria, urgency, nocturia, suprapubic pain, frequency, and incontinence associated with cystitis, prostatitis, urethritis, and urethrocystitis/urethrotrigonitis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.
CNS: Nervousness; headache; drowsiness; mental confusion.
CVS: Tachycardia; palpitations.
GI: Nausea; vomiting.
MISC: High fever; leukopenia.

CLINICAL IMPLICATIONS

General

- Monitor vital signs.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

flecainide acetate (fleh-CANE-ide ASS-uh-TATE)

Tambocor

Drug Class: Antiarrhythmic

PHARMACOLOGY

Action

Produces a dose-related decrease in intracardiac conduction in all parts of the heart; also has local anesthetic activity.

Uses

Prevention of PAF associated with disabling symptoms; PSVTs, including AV nodal reentrant tachycardia and AV reentrant tachycardia; prevention of documented life-threatening ventricular arrhythmias, such as sustained VT.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste changes; swollen lips, tongue, mouth (unspecified).
CNS: Dizziness including lightheadedness, faintness, unsteadiness, and near syncope (19%); headache (10%); fatigue (8%); asthenia, tremor (5%); hypoesthesia, paresthesia, pa-

resis, ataxia, flushing, increased sweating, vertigo, syncope, somnolence, anxiety, insomnia, depression, malaise (1% to <3%).

CVS: Sinus bradycardia; tachycardia; arrhythmia; hypertension or hypotension.

GI: Nausea (9%); constipation (4%); abdominal pain (3%); vomiting, diarrhea, dyspepsia, anorexia (1% to <3%).

RESP: Dyspnea (10%).

MISC: Edema (4%); fever (1% to <3%); photophobia.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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fluconazole (flew-KOE-nuh-zole)

Diflucan: Tablets: 50, 100, 150, 200 mg; Powder for Oral Suspension: 10, 40 mg/mL when reconstituted; Injection: 2 mg/mL

Apo-Fluconazole, Apo-Fluconazole-150, Diflucan-150

Afungil, Neofomiral, Oxifungol, Zonal

Drug Class: Anti-infective; Antifungal

PHARMACOLOGY

Action

Interferes with the formation of fungal cell membrane, causing leakage of cellular contents and cell death.

Uses

Oropharyngeal and esophageal candidiasis; vaginal candidiasis; prevention of candidiasis in bone marrow transplant; *Cryptococcal meningitis*.

Contraindications

Coadministration of cisapride; hypersensitivity to any component of the product.

Usual Dosage

Oropharyngeal or esophageal candidiasis

ADULTS: *PO/IV:* 200 mg first day, followed by 100 mg once a day thereafter for a minimum of 2 wk for oropharyngeal candidiasis, or for 3 wk and at least 2 wk following resolution of symptoms for esophageal candidiasis.

CHILDREN: *PO/IV:* 6 mg/kg on first day, followed by 3 mg/kg once a day thereafter for minimum of 2 wk for oropharyngeal candidiasis or 3 wk (at least 2 wk after symptom resolution) for esophageal candidiasis.

Pharmacokinetics

ABSORP: Bioavailability is more than 90%. T_{max} is 1 to 2 hr.

DIST: Apparent Vd is 0.65 L/kg, and it is 11% to 12% protein bound. Ratio of tissue (fluid) concentrations to concurrent plasma concentrations is as follows: CSF 0.5 to 0.9, saliva 1, sputum 1, blister fluid 1, urine 10, normal skin 10, nails 1, blister skin 2, vaginal tissue 1, and vaginal fluid 0.4 to 0.7.

EXCRET: Mean body Cl is 0.23 mL/min/kg; $t_{1/2}$ is 20 to 50 hr. The drug is cleared primarily by renal excretion, about 80% in urine as unchanged drug and 11% excreted in urine as metabolites.

HEMODIALYSIS: A 3-hr session decreases plasma concentrations about 50%.

SPECIAL POP: *Renal failure:* Pharmacokinetics are markedly affected; there is an inverse relationship between $t_{1/2}$ and Ccr.

F

DRUG INTERACTIONS

Alfentanil: Alfentanil toxicity (decreased metabolism)
- Monitor clinical status.

Anticoagulants, oral: Increased anticoagulant effect (decreased metabolism)
- Use with caution.

Antidepressants, tricyclic: Possible nortriptyline or amitriptyline toxicity (decreased metabolism)
- Monitor clinical status.

Caffeine: Possible caffeine toxicity (decreased metabolism)
- Monitor clinical status.

Carbamazepine: Possible carbamazepine toxicity (decreased metabolism)
- Monitor clinical status.

COX-2 inhibitors: Possible celecoxib toxicity (decreased metabolism)
- Avoid concurrent use.

Cyclosporine: Renal toxicity (decreased metabolism)
- Avoid concurrent use or monitor cyclosporine concentration.

Glimepiride: Possible increased risk of hypoglycemia (decreased metabolism)
- Monitor blood glucose.

Glipizide: Severe hypoglycemia (decreased metabolism)
- Monitor blood glucose.

Irbesartan: Possible irbesartan toxicity (decreased metabolism)
- Monitor clinical status.

Losartan: Possible losartan toxicity (decreased metabolism)
- Monitor clinical status.

Methadone: Possible methadone toxicity (decreased metabolism)
- Monitor clinical status.

Nifedipine: Possible nifedipine toxicity (decreased metabolism)
- Monitor blood pressure.

Phenytoin: Phenytoin toxicity (decreased metabolism)
- Avoid concurrent use or monitor phenytoin concentration.

Rifabutin: Uveitis (decreased metabolism)
- Monitor clinical status.

Rifampin: Decreased fluconazole effect (increased metabolism)
- Avoid concurrent use.

Saquinavir: Possible saquinavir toxicity (decreased metabolism)
- Monitor clinical status.

Tacrolimus: Possible tacrolimus toxicity (decreased metabolism)
- Avoid concurrent use or monitor tacrolimus concentration.

Theophylline: Possible theophylline toxicity (decreased metabolism)
- Monitor clinical status.

Verapamil: Possible verapamil toxicity (decreased metabolism)
- Monitor blood pressure.

Zidovudine: Possible zidovudine toxicity (decreased metabolism)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Taste disturbance (1%).
CVS: QT prolongation (including torsades de pointes).
CNS: Headache (2%).
GI: Nausea (4% [children 2%]); vomiting (2% [children 5%]); abdominal pain (2% [children 3%]); diarrhea (2%).
MISC: Leukopenia; thrombocytopenia; hypokalemia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- If GI side effects occur, consider semisupine chair position.

When prescribed by DDS:
- Ensure patient knows how to take the drug, how long it should be taken, and to immediately report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset). See Chapter 4: *Medical Management of Odontogenic Infections*.
- Single-dose regimen is associated with more adverse effects.
- *Lactation:* Excreted in breast milk.
- *Children:* An open-label, randomized, controlled trial has shown fluconazole to be effective in children 6 mo to 13 yr old. Efficacy has not been established in infants younger than 6 mo.
- *Renal failure:* Dosage reduction based on Ccr may be necessary.
- *Anaphylaxis:* Anaphylaxis occurred rarely.
- *Dermatologic changes:* Exfoliative skin disorders reported.
- *Hepatic injury:* Monitor patients with abnormal LFT results for development of more severe hepatic injury.
- *Immunocompromised patients:* To prevent relapse, patients with AIDS and cryptococcal meningitis usually require maintenance therapy.
- *Overdosage:* Hallucinations, paranoid behavior.

Pregnancy Risk Category: Category C.

Oral Health Education

When prescribed by DDS:
- Explain name, dose, action, and potential side effects of drug.
- Advise patient to read *Patient Information* leaflet before starting therapy and with each refill.
- Review dosing schedule and prescribed length of therapy with patient. Advise patient that treatment may be prolonged (e.g., several wk or mo) and to continue medication until advised to stop using by health care provider.

Tablets and Suspension
- Advise patient that tablets can be taken with a full glass of water without regard to meals but to take with food if GI upset occurs.
- Advise patient using suspension that the suspension can be taken without regard to meals but to take with food if GI upset occurs.
- Advise patient or caregiver to shake suspension well before measuring dose and to measure prescribed dose of suspension using dosing cup, spoon, or syringe.
- Advise patient that if a dose is missed, to take as soon as remembered. However, if it is nearing the time for the next dose, to skip the dose and take the next dose at the regularly scheduled time.
- Remind patient to complete entire course of therapy, even if symptoms of infection have disappeared.

- Advise patient to inform health care provider if infection does not improve or worsens.
- Advise patient to contact health care provider immediately if skin rash, persistent nausea or vomiting, dark urine, or yellowing of skin or eyes occur.
- Advise women to notify health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Instruct patient not to take any prescription or OTC medications or dietary supplements unless advised by health care provider.
- Advise patient that follow-up examinations and lab tests may be required to monitor therapy and to keep appointments.

fludrocortisone acetate (flew-droe-CORE-tih-sone ASS-uh-TATE)

Drug Class: Mineralocorticoid

PHARMACOLOGY

Action

Exerts salt-retaining (mineralocorticoid) activity by acting on renal distal tubules to enhance reabsorption of sodium and increasing urinary excretion of potassium, hydrogen, and magnesium ions.

Uses

Partial replacement therapy for primary and secondary adrenocortical insufficiency in Addison disease; treatment of salt-losing adrenogenital syndrome.

Unlabeled Uses

Treatment of severe orthostatic hypotension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Aspirin: Reduced aspirin effect (mechanism unknown)
- Monitor clinical status.

Midazolam: Possible decreased midazolam effect (increased metabolism)
- Monitor clinical status.

COX-1 inhibitors: Increased risk of peptic ulcer disease (additive)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Masking of infection.

CNS: Convulsions; vertigo; severe mental disturbance.

CVS: Hypertension; thrombophlebitis.

GI: Peptic ulcer; pancreatitis.

MISC: Hypokalemic alkalosis. May also cause adverse reactions associated with glucocorticoids (e.g., dexamethasone); impaired wound healing, petechia, ecchymoses; secondary adrenocortical and pituitary unresponsiveness in times of stress (i.e., surgery, infection); osteoporosis.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Due to the anticipated perioperative physiological stress, patients undergoing dental care (i.e., minor surgical stress) under local anesthesia should take only their usual daily glucocorticoid dose before dental intervention. No supplementation is justified.
- Anticipate addisonian or cushingoid complications affecting the head and neck area.
- Be aware that signs of bacterial oral infection may be masked and anticipate oral candidiasis.
- Monitor vital signs (e.g., BP pulse).

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.

flumazenil (flew-MAZ-ah-nil)

Romazicon: Injection: 0.1 mg/mL

Anexate

Lanexat

Drug Class: Benzodiazepine antagonist

PHARMACOLOGY

Action

Antagonizes actions of benzodiazepines on CNS by blocking receptors.

Uses

Complete or partial reversal of sedative effects of benzodiazepines where general anesthesia is induced or maintained with benzodiazepines, where sedation produced with benzodiazepines for diagnostic or therapeutic procedures, and for the management of benzodiazepine overdose.

Usual Dosage

Reversal of conscious sedation or in general anesthesia

ADULTS: *IV:* 0.2 mg over 15 sec. If desired level of consciousness is not achieved in 45 sec, additional 0.2 mg doses can be administered at 60 sec intervals (max, 1 mg). In event of resedation, repeat doses (0.2 mg/min to max 1 mg) at 20 min intervals as needed (max, 3 mg/hr).

Management of suspected benzodiazepine overdose

ADULTS: *IV:* 0.2 mg over 30 sec. If desired level of consciousness is not achieved in 30 sec, an additional dose of 0.3 mg over 30 sec can be administered. Further doses of 0.5 mg over 30 sec can be administered at 1 min intervals as needed (max, 3 mg).

Pharmacokinetics

ABSORP: Mean C_{max} is 24 ng/mL (range, 11 to 43 ng/mL); mean AUC was 15 ng hr/mL (range, 10 to 22 ng hr/mL).

DIST: Initial distribution $t_{1/2}$ is 7 to 15 min. $Vd_{initial}$ is 0.5 L/kg; Vd_{ss} is 0.177 to 1.60 L/kg. Protein binding is about 50%.

METAB: Primarily hepatically metabolized and dependent on hepatic blood flow (highly extracted).

EXCRET: Terminal $t_{1/2}$ is 41 to 79 min. Total clearance is 0.7 to 1.3 L/hr/kg (increases by 50% during ingestion of food). Less than 1% is excreted unchanged in the urine; 90% to 95% is excreted in urine and 5% to 10% in feces.

ONSET: 1 to 2 min.

PEAK: 6 to 10 min.

DURATION: Related to the plasma concentration of the benzodiazepine as well as the dose of flumazenil.

SPECIAL POP: *Hepatic failure:* MODERATE: Mean total clearance decreased 40% to 60%; $t_{1/2}$ increases to 1.3 hr. *Severe:* Mean total clearance decreased 75%; $t_{1/2}$ increases to 2.4 hr.

Children 1 to 17 yr: The $t_{1/2}$ is shorter and more variable, ranging from 20 to 75 min.

DRUG INTERACTIONS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Convulsions; headache; dizziness; agitation; emotional lability; fatigue; paresthesia; insomnia; dyspnea; hypoesthesia.

GI: Nausea; vomiting.

RESP: Hyperventilation.
MISC: Injection site pain; injection site reaction.

CLINICAL IMPLICATIONS

General

- This is an acute use drug to reverse sedative effects of benzodiazepines used in general anesthesia. Patients would be very unlikely to report taking this drug.

Pregnancy Risk Category: Category C.

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flunisolide (flew-NISS-oh-lide)

AeroBid, AeroBid-M, Nasarel

Apo-Flunisolide, ratio-Flunisolide

Drug Class: Corticosteroid

PHARMACOLOGY

Action

Has local anti-inflammatory activity on lung or nasal mucosa with minimal systemic effect. May decrease number and activity of cells involved in inflammatory response and enhance effect of other drugs or endogenous substances that aid in bronchodilation.

Uses

Inhalation: Maintenance treatment of asthma for patients requiring long-term treatment with corticosteroids.
Intranasal: Symptoms of perennial or seasonal rhinitis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Oral Inhalation: Unpleasant taste (10%); candidiasis (1% to 9%); mouth irritation (1 to 3%).
Nasal Spray: Aftertaste (17%).

CNS: Oral Inhalation: Headache (25%); dizziness, irritability, nervousness, shakiness (3% to 9%); anxiety, depression, faintness, fatigue, hyperactivity, hypoactivity, insomnia, moodiness, numbness, vertigo (1% to 3%).

GI: Oral Inhalation: Nausea/vomiting (25%); diarrhea; upset stomach; abdominal pain; heartburn; constipation; dyspepsia; gas.
Nasal Spray Aftertaste (17%); nausea (>1%).

RESP: Oral Inhalation: Upper respiratory tract infection (25%); cold symptoms, nasal congestion (15%); chest congestion, cough, hoarseness, sneezing, sputum, wheezing (3% to 9%); bronchitis, chest tightness, dyspnea, epistaxis, head stuffiness, laryngitis, pleurisy, pneumonia (1% to 3%).
Nasal Spray: Increased cough (>1%).

MISC: Oral Inhalation: Flu (10%); chest pain, decreased appetite, edema, fever (3% to 9%); chills, peripheral edema, sweating, weakness, malaise, increased appetite (1% to 3%).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse rate, respiratory rate and function); uncontrolled disease characterized by wheezing and coughing.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Anticipate oral candidiasis when steroids are used.

- Due to the anticipated perioperative physiological stress (minor surgical stress), patients undergoing dental care under local anesthesia should take only their usual daily glucocorticoid dose before dental intervention. No supplementation is justified.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.

Oral Health Education

- Teach patient to rinse mouth and gargle vigorously with water after inhaled steroid use to minimize the potential for candidiasis.
- Encourage daily plaque control procedures for effective self-care.

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fluocinonide (flew-oh-SIN-oh-nide)

Lidex: Cream: 0.05%; Gel: 0.05%; Ointment: 0.05%; Topical Solution: 0.05%
Lidex-E: Cream: 0.05%
Vanos: Cream: 0.1%

Tiamol, Topsyn

Drug Class: Corticosteroid

PHARMACOLOGY

Action

Depresses formation, release, and activity of endogenous mediators of inflammation such as prostaglandins, kinins, histamine, liposomal enzymes, and complement system.

Uses

Relief of inflammatory and pruritic manifestations of corticosteroid-responsive dermatoses.

Contraindications

Standard considerations.

Usual Dosage

Apply to the affected area as a thin film 4 qid.

DRUG INTERACTIONS

Doxycycline: Decreased doxycycline effect (increased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Burning; stinging; cracking of mucosa; erythema.

CLINICAL IMPLICATIONS

General

When prescribed by DDS:

- *Lactation:* Unknown whether topical administration could result in sufficient systemic absorption to produce detectable quantities in human breast milk. Exercise caution when topical corticosteroids are administered to a nursing woman.
- *Children:* May demonstrate greater susceptibility to topical corticosteroid-induced hypothalaimic pituitary-adrenal (HPA) axis suppression and Cushing syndrome.

Pregnancy Risk Category: Category C.

Oral Health Education

When prescribed by DDS:

- Explain name, action, and potential side effects of drug.
- Advise patient to apply medication as directed by health care provider.
- Caution patient not to bandage, cover, or wrap treated skin areas or use cosmetics or other skin products over treated areas unless advised by health care provider.
- Caution patient to avoid contact with the eyes. Advise patient that if medication does come into contact with the eyes, to wash eyes with large amounts of cool water and contact health care provider if eye irritation occurs.

- Advise patient that symptoms should begin to improve fairly soon after starting treatment and to notify health care provider if condition does not improve, worsens, or if application site reactions (e.g., burning, stinging, redness, itching) develop.
- Advise patient that therapy is usually discontinued when control has been achieved.
- Advise patient that follow-up visits to monitor response to treatment may be required and to keep appointments.

fluorouracil (FLURE-oh-YOUR-uh-sill)

Adrucil, Carac, Efudex, Fluoroplex

Efudix

Drug Class: Pyrimidine antimetabolite

PHARMACOLOGY

Action

The metabolism of fluorouracil in the anabolic pathway blocks the methylation reaction of deoxyuridylic acid to thymidylic acid. In this manner, fluorouracil interferes with the synthesis of DNA and to a lesser extent inhibits the formation of RNA.

Uses

Colon, rectum, breast, gastric, and pancreatic carcinoma (injection); multiple actinic or solar keratoses, superficial basal cell carcinoma (topical).

Unlabeled Uses

Ovarian, cervical, bladder, hepatic, islet cell, prostate, endometrial, esophageal, and head and neck carcinoma.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Metronidazole: Metronidazole toxicity (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Adrucil: Stomatitis; esophagopharyngitis (which may lead to sloughing and ulceration).
Efudex: Cases of miscarriage/birth defect (ventricular septal defect) when applied to mucous membranes; metallic taste; stomatitis.
CNS: Adrucil: Acute cerebellar syndrome (may persist after discontinuation of treatment); nystagmus; headache; disorientation; confusion; euphoria.
Carac: Headache (3%).
GI: Adrucil: Diarrhea; anorexia; nausea; emesis (most common); GI ulceration; bleeding.
MISC: Adrucil: Thrombophlebitis; epistaxis; nail changes (including loss of nails).
Carac: Edema (35%); common cold (2%); allergy (1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Advise products for palliative relief of oral manifestations (e.g., stomatitis, mucositis, xerostomia, etc.).
- Medical consultation to determine WBC and platelet count before invasive dental procedures, including periodontal debridement.
- Anticipate recurrent herpes simplex and varicella zoster infections.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

fluoxetine HCl (flew-OX-uh-teen HIGH-droe-KLOR-ide)

Prozac, Prozac Weekly, Sarafem

Apo-Fluoxetine, CO Fluoxetine, Gen-Fluoxetine, Novo-Fluoxetine, Nu-Fluoxetine, PMS-Fluoxetine, ratio-Fluoxetine, Rhoxal-fluoxetine, STCC-Fluoxetine

Fluoxac, Siquial

Drug Class: Antidepressant

PHARMACOLOGY

Action

Blocks reuptake of serotonin, enhancing serotonergic function.

Uses

PROZAC: Depression; OCD; bulimia nervosa, panic disorder.
SARAFEM: PMDD.

Unlabeled Uses

Alcoholism; anorexia nervosa; attention deficit hyperactivity disorder; bipolar II disorder; borderline personality disorder; chronic rheumatoid pain; diabetic peripheral neuropathy; kleptomania; levodopa-induced dyskinesia; migraine, chronic daily headaches, and tension-type headache; narcolepsy; schizophrenia; social phobia; trichotillomania.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Itraconazole: Possible fluoxetine toxicity (decreased metabolism)
- Avoid concurrent use.

Diazepam or alprazolam: Possible impairment of skills related to driving (decreased metabolism)
- Warn patient.

Chloral hydrate: Prolonged drowsiness (mechanism unknown)
- Monitor clinical status.

Tramadol: Increased risk of seizure (additive)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disturbance.

CNS: Agitation; anxiety; nervousness; headache; insomnia; abnormal dreams; drowsiness; dizziness; tremor; fatigue; decreased libido; decreased concentration; seizures; delusions; hallucinations; coma.

CVS: Chest pain, hypertension, palpitations, vasodilation (3%); postural hypotension (1%).

GI: Nausea; vomiting; diarrhea; anorexia; upset stomach; constipation; abdominal pain.

RESP: Flu-like symptoms; bronchitis; rhinitis; yawning; coughing; asthma; pneumonia; apnea; lung edema; pleural effusion.

MISC: Weakness; chills; joint or muscle pain; fever; hypersensitivity reaction; photophobia (1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.

- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Depressed or anxious patients may neglect self care. Monitor for plaque control effectiveness.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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fluphenazine (flew-FEN-uh-zeen)

(fluphenazine decanoate, fluphenazine HCl)

Fluphenazine Hydrochloride

Apo-Fluphenazine, Apo-Fluphenazine Decanoate Injection, Fluphenazine Omega, Modecate, Modecate Concentrate, Moditen hydrochloride, PMS-Fluphenazine Decanoate

Drug Class: Antipsychotic, phenothiazine

PHARMACOLOGY

Action

Blocks dopamine receptor in CNS.

Uses

Fluphenazine Hydrochloride: Management of psychotic disorders.

Fluphenazine Decanoate: Long-acting parenteral depot products for long-term neuroleptic therapy.

Unlabeled Uses

Nausea/vomiting.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Salivation; tardive dyskinesia; dry mouth.

CNS: Pseudoparkinsonism; dyskinesia; motor restlessness; oculogyric crises; opisthotonos; hyperreflexia; headache; weakness; tremor; fatigue; slurring; insomnia; vertigo; seizures; drowsiness; hallucinations; lethargy; increased libido; lightheadedness; faintness; dizziness.

CVS: Hypertension; tachycardia.

GI: Nausea; dyspepsia; constipation; fecal impaction; paralytic ileus; adynamic ileus (may result in death).

RESP: Laryngospasm; bronchospasm; dyspnea; acute fulminating pneumonia or pneumonitis.

MISC: Increases in appetite and weight; polydipsia; increased prolactin levels; neuroleptic malignant syndrome; loss of appetite; peripheral edema; sudden unexpected and unexplained death; photosensitivity; blood dyscrasias (e.g., agranulocytosis, eosinophilia, leukocytosis, leukopenia).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.

- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Monitor vital signs.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

flurandrenolide (FLURE-an-DREEN-oh-lide)

Cordran V, Cordran SP, Cordran

Drug Class: Corticosteroid, topical

PHARMACOLOGY

Action

Decreases inflammation by suppression of PMN migration and reversal of increased capillary permeability

Uses

Inflammatory dermatoses.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Perioral dermatitis; thinning of mucosa when applied to mucosa.

MISC: Numbness of fingers; thinning of skin.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Be aware that signs of bacterial oral infection may be masked and anticipate oral candidiasis.

Oral Health Education

- *When prescribed by DDS:* Ensure patient understands how to use product, amount to apply, method of application, and signs of adverse effects.

flurazepam HCl (flure-AZE-uh-pam HIGH-droe-KLOR-ide)

Dalmane

Apo-Flurazepam, Novo-Flupam

Drug Class: Sedative; Hypnotic; Benzodiazepine

PHARMACOLOGY

Action

Potentiates action of gamma-aminobutyric acid (GABA), an inhibitory neurotransmitter, resulting in increased neural inhibition and CNS depression, especially in limbic system and reticular formation.

Uses

Treatment of insomnia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste alterations.

CNS: Dizziness; drowsiness; lightheadedness; staggering; ataxia; falling; lethargy; confusion; impaired memory; headache; weakness; paradoxical excitement; talkativeness; euphoria; apprehension; irritability; hallucinations; slurred speech; depression.

CVS: Palpitations; chest pain; tachycardia.

GI: Heartburn; nausea and vomiting; diarrhea; constipation; anorexia; upset stomach; GI pain.

RESP: Shortness of breath.

MISC: Tolerance; physical and psychological dependence; body and joint pains; sweating; flushing; leukopenia granulocytopenia.

F

CLINICAL IMPLICATIONS

General

- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Monitor vital signs.
- Chronic dry mouth is possible; anticipate increased caries and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased infection and poor healing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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flurbiprofen (FLURE-bih-PRO-fen)

(flurbiprofen sodium)

Ansaid, Ocufen

Apo-Flurbiprofen, Froben, Froben SR, Novo-Flurbiprofen, Novo-Flurprofen, Nu-Flurbiprofen, ratio-Flurbiprofen

Drug Class: Analgesic; NSAID

PHARMACOLOGY

Action

Decreases inflammation, pain, and fever, probably through inhibition of COX activity and prostaglandin synthesis.

Uses

SYSTEMIC: Treatment of rheumatoid arthritis and osteoarthritis.

OPHTHALMIC: Inhibition of intraoperative miosis.

Unlabeled Uses

Treatment of juvenile rheumatoid arthritis; migraine; dysmenorrhea; sunburn; mild to moderate pain; acute gout; ankylosing spondylitis; tendinitis; bursitis; inflammation after cataract surgery; uveitis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; stomatitis (1%).

CNS: Dizziness; drowsiness; vertigo; headaches; nervousness; migraine; anxiety; confusion.

CVS: Hypertension, arrhythmia (1%).
GI: Heartburn; dyspepsia; nausea; vomiting; anorexia; diarrhea; constipation; increased or decreased appetite; indigestion; GI bleeding; ulceration.
RESP: Bronchospasm; laryngeal edema; dyspnea; hemoptysis; shortness of breath.
MISC: Hyperglycemia; hypoglycemia; hyponatremia blood dyscrasias (e.g., leukopenia, thrombocytopenia) (<1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Use COX inhibitors with caution; they may exacerbate PUD and GERD.
- *Arthritis:* Consider patient comfort and need for semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity, candidiasis, and lichenoid mucositis.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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fluticasone propionate (flew-TICK-ah-SONE PRO-pee-oh-nate)

Flonase, Flovent, Flovent Diskus

Florinef, Floven HF

Drug Class: Corticosteroid

PHARMACOLOGY

Action

Exerts potent anti-inflammatory effect on nasal passages.

Uses

Management of the nasal symptoms of seasonal and perennial allergic and nonallergic rhinitis in adults and pediatric patients age 4 yr and older (Flonase); patients requiring oral corticosteroid therapy for asthma (Flovent, Flovent Rotadisk, Flovent Diskus); maintenance treatment of asthma as prophylactic therapy in patients age 4 yr and older (Flovent Diskus, Flovent Rotadisk) and 12 yr and older (Flovent).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** FLOVENT INHALATION POWDER: Oral ulcerations, dental discomfort and pain, oral erythema and rashes, mouth and tongue disorders, oral discomfort and pain, tooth decay (1% to 3%).
FLOVENT INHALATION AEROSOL: Candidiasis (2% to 5%).
CNS: FLONASE: Headache (16%); dizziness (1% to 3%).
FLOVENT INHALATION AEROSOL: Headache (22%); giddiness (1% to 3%); dizziness.
FLOVENT INHALATION POWDER: Headache (14%); dizziness, sleep disorders, migraines, paralysis of cranial nerves, mood disorders, malaise, fatigue (1% to 3%).
GI: FLONASE: Nausea, vomiting (5%); abdominal pain, diarrhea (1% to 3%).
FLOVENT INHALATION AEROSOL: Nausea, vomiting diarrhea, dyspepsia, stomach disorder (1% to 3%).

FLOVENT INHALATION POWDER: Nausea, vomiting (8%); viral infection (5%); discomfort/pain (4%); diarrhea, GI signs and symptoms, gastroenteritis, infection abdominal discomfort and pain (1% to 3%).

RESP: FLONASE: Asthma symptoms (7%); cough (4%); bronchitis (1% to 3%).
FLOVENT INHALATION AEROSOL: Upper respiratory tract infection (22%); influenza (8%); bronchitis, chest congestion (1% to 3%).
FLOVENT INHALATION POWDER: Upper respiratory tract infection (21%); bronchitis (8%); lower respiratory infection, cough (5%); upper respiratory inflammation (4%).

MISC: FLONASE: Fever, flu-like symptoms, aches and pains (1% to 3%); hypersensitivity (including angioedema, anaphylaxis/anaphylactoid reactions); growth suppression.
FLOVENT INHALATION AEROSOL: Fever; immediate and delayed hypersensitivity, including urticaria, rash, angioedema, and bronchospasm (≤2%).
FLOVENT INHALATION POWDER: Fever (7%); viral infection (5%); immediate and delayed hypersensitivity reactions, including rash, angioedema, and bronchospasm (<2%); soft-tissue injury, contusions, hematomas, wounds, lacerations, postoperative complications, burns, poisoning and toxicity, pressure-induced disorders, chest symptoms, pain, edema, swelling, bacterial infections, fungal infections, mobility disorders, cysts, lumps, masses (1% to 3%).

F

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse rate, respiratory rate and function); uncontrolled disease characterized by wheezing and coughing.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Despite the anticipated perioperative physiological stress (i.e., minor surgical stress), patients undergoing dental care under local anesthesia should take only their usual daily glucocorticoid dose before dental intervention. No supplementation is justified.
- Anticipate oral candidiasis when steroids are used.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Inhalants can dry oral mucosa; anticipate increased calculus, plaque levels, and caries.

Oral Health Education

- Teach patient to rinse mouth and gargle vigorously with water after inhaled steroid use to minimize the potential for candidiasis.
- Encourage daily plaque control procedures for effective self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

fluticasone propionate/salmeterol (flew-TICK-ah-SONE PRO-pee-oh-nate/sal-MEET-ah-rahl)

Synonym: salmeterol/fluticasone propionate

Advair Diskus

Drug Class: Respiratory inhalant combination

PHARMACOLOGY

Action

FLUTICASONE: Inhibits multiple cell types (e.g., mast cells) and mediator production or secretion (e.g., histamine) involved in the asthmatic response.
SALMETEROL: Produces bronchodilation by relaxing bronchial smooth muscle through beta-2-receptor stimulation.

Uses

Long-term maintenance treatment of asthma; COPD associated with chronic bronchitis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

The following adverse reactions occurred at a rate of at least 1% and were more common than in the placebo group.

⚠ **ORAL:** Candidiasis; dental discomfort and pain; oral ulcerations; taste disturbance.

CNS: Headache; sleep disorders; tremors; hypnagogical effects; compressed nerve symptoms.

CVS: Palpitations; tachycardia.

GI: Nausea; vomiting; GI discomfort and pain; diarrhea; GI infections (including viral); GI signs and symptoms; gastroenteritis; GI disorders; constipation; appendicitis.

RESP: Upper respiratory tract inflammation and infection; viral respiratory infections; bronchitis; cough; wheezing; chest symptoms; pneumonia; lower respiratory signs and symptoms; lower respiratory tract infections.

MISC: Muscle injuries; fractures; wounds; lacerations; contusions; hematoma; burns; arthralgia; articular rheumatism; muscle stiffness; tightness and rigidity; bone and cartilage disorders; allergies and allergic reactions; viral and bacterial infections; pain.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse rate, respiratory rate and function); uncontrolled disease characterized by wheezing and coughing.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Ensure that bronchodilator inhaler is present at each dental appointment.
- Due to the anticipated perioperative physiological stress (minor surgical stress), patients undergoing dental care under local anesthesia should take only their usual daily glucocorticoid dose before dental intervention. No supplementation is justified.
- Anticipate oral candidiasis when steroids are used.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Inhalants can dry oral mucosa; anticipate candidiasis and increased calculus, plaque levels, and caries activity.

Oral Health Education

- Teach patient to rinse mouth and gargle vigorously with water after inhaled steroid use to minimize the potential for candidiasis.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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fluvastatin (FLEW-vah-stat-in)

Lescol, Lescol XL

Canef

Drug Class: Antihyperlipidemic, HMG-CoA reductase inhibitor

PHARMACOLOGY

Action

Increases rate at which body removes cholesterol from blood and reduces production of cholesterol in body by inhibiting enzyme that catalyzes early rate-limiting step in cholesterol synthesis; increases HDL; reduces LDL, VLDL, and triglycerides.

Uses

ATHEROSCLEROSIS: To slow the progression of coronary atherosclerosis.
HYPERCHOLESTEROLEMIA: To reduce elevated total cholesterol, LDL, apo-B, and triglyceride cholesterol levels and to increase HDL levels.
SECONDARY PREVENTION OF CORONARY EVENTS: To reduce the risk of undergoing coronary revascularization procedures in patients with coronary heart disease.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Headache (9%); fatigue, insomnia (3%).
GI: Dyspepsia (8%); diarrhea, abdominal pain (5%); nausea, flatulence (3%).
RESP: Bronchitis (7.6%), URI (16%).
MISC: Flu-like symptoms (7%); accidental trauma (5%); back pain, myalgia (5%).

CLINICAL IMPLICATIONS

General

- High LDL cholesterol concentration is the major cause of atherosclerosis, which leads to CAD (angina, MI); determine degree of CV health and ability to withstand stress of dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. refer to the section entitled "The patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- If GI or respiratory side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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fluvoxamine maleate (flu-VOX-uh-meen MAL-ee-ate)

Luvox, Luvox CR

Apo-Fluvoxamine, Novo-Fluvoxamine, Nu-Fluvoxamine, PMS-Fluvoxamine, ratio-Fluvoxamine

Drug Class: Antidepressant, selective serotonin inhibitor

PHARMACOLOGY

Action

Inhibits neuronal reuptake of serotonin in brain.

Uses

Treatment of obsessive-compulsive disorder (OCD).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Tramadol: Increased risk of seizures (additive)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (14%); tooth discoloration, taste disturbances (3%); dysphagia (2%).
CNS: Headache, somnolence (22%); insomnia (21%); nervousness (12%); dizziness (11%); tremor, anxiety (5%); hypertonia, agitation, depression, stimulation (2%).
CVS: Palpitations, vasodilation (3%); postural hypotension, hypertension, tachycardia (≥1%).
GI: Nausea (40%); diarrhea (11%); constipation, dyspepsia (10%); anorexia (6%); vomiting (5%); flatulence (4%).

RESP: URI (9%); dyspnea, yawn (2%).
MISC: Asthenia (14%); flu-like syndrome (3%); chills (2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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folic acid (FOE-lik ASS-id)

Folvite

Apo-Folic

AF Valdecasas, Flynoken, Folitab

Drug Class: Vitamin

PHARMACOLOGY

Action

Required for nucleoprotein synthesis and maintenance of normal erythropoiesis; precursor of tetrahydrofolic acid, which is necessary for transformylation reactions in the biosynthesis of purines and thymidylates of nucleic acids.

Uses

Megaloblastic anemia caused by folic acid deficiency as may be seen in tropical or nontropical sprue in anemias of nutritional origin, pregnancy, infancy, or childhood.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

Adverse effects are rare.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Anemias can reduce wound healing.

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fondaparinux sodium (fon-dah-PAH-rin-ux SO-dee-uhm)

Arixtra

Drug Class: Selective factor XA inhibitor

PHARMACOLOGY

Action

Selective inhibition of antithrombin III (ATIII), which potentiates the innate neutralization of factor Xa by ATIII. Neutralization of factor Xa interrupts the blood coagulation cascade and inhibits thrombin formation and thrombus development.

Uses

Prophylaxis of deep vein thrombosis (DVT) that may lead to pulmonary embolism in patients undergoing hip fracture surgery including extended prophylaxis, hip replacement surgery, knee replacement surgery, or abdominal surgery (when at risk for thromboembolic complications); in conjunction with warfarin, fondaparinux is indicated for the treatment of acute DVT and acute pulmonary embolism (PE).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

NSAIDs: Increased risk of bleeding (additive)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Increased bleeding.

CVS: Hypotension (4%); hypertension (2%).

CNS: Headache, insomnia (5%); dizziness (4%); confusion (3%).

GI: Nausea (11%); constipation (9%); vomiting (6%); diarrhea (3%); dyspepsia (2%); abdominal pain (1%).

RESP: Coughing, pneumonia (2%).

MISC: Fever (14%); increased wound drainage, postoperative wound infection (5%); hematoma (3%); pain (2%); back, chest, or leg pain (1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment. Patients recovering from orthopedic surgery unlikely to seek elective dental treatment.
- Monitor vital signs.
- If uncontrolled bleeding develops, use hemostatic agents and positive pressure to induce hemostasis. Do not dismiss patient until bleeding is controlled.
- If patient has undergone total joint replacement, determine if antibiotic prophylaxis is necessary.

Oral Health Education

- Encourage patient to follow daily plaque control procedures for effective self-care.

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formoterol fumarate (fore-MOE-ter-ole FEW-mah-rate)

Foradil Aerolizer

Oxeze Turbuhaler

Oxis

Drug Class: Selective beta-2 bronchodilator; Sympathomimetic

PHARMACOLOGY

Action

Relaxes bronchial smooth muscles.

Uses

Long-term maintenance treatment of asthma; prevention of bronchospasms; prevention of exercise-induced bronchospasm; concomitant therapy with short-acting beta$_2$-agonists, inhaled or systemic corticosteroids, and theophylline therapy; long-term administration in

the maintenance of bronchoconstriction in patients with COPD, including chronic bronchitis and emphysema.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disturbance.
CNS: Nervousness; headache; tremor; dizziness; fatigue; malaise; insomnia; dysphoria.
CVS: Palpitation, tachycardia (frequent).
GI: Nausea; gastroenteritis; abdominal pain; dyspepsia.
RESP: Bronchitis; URI; dyspnea; chest infection.
MISC: Muscle cramps; viral infection.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function. Uncontrolled disease characterized by wheezing, coughing.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Ensure that bronchodilator inhaler is present at each dental appointment.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Inhalants can dry oral mucosa; anticipate candidiasis, increased calculus, plaque levels, and increased caries.

Oral Health Education

- Rinse mouth with water after bronchodilator use to prevent dryness.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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fosfomycin tromethamine (foss-foe-MY-sin troe-METH-ah-meen)

Monurol

Fosfocil

Drug Class: Antibiotic

PHARMACOLOGY

Action

Interferes with bacterial cell wall biosynthesis.

Uses

Treatment of uncomplicated UTI (acute cystitis) in women caused by susceptible strains of specific microorganisms.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (1%).
CNS: Headache; dizziness.
GI: Diarrhea; nausea; dyspepsia; abdominal pain.
RESP: Rhinitis (4.5%).
MISC: Asthenia; back pain; pain.

CLINICAL IMPLICATIONS

General

- This drug is administered in a one-dose regimen; chronic dry mouth is unlikely to occur.
- If GI side effects occur, consider semisupine chair position.

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fosinopril sodium (FAH-sin-oh-PRILL SO-dee-uhm)

Monopril

Drug Class: Antihypertensive; ACE inhibitor

PHARMACOLOGY

Action

Competitively inhibits angiotensin I-converting enzyme, preventing conversion of angiotensin I to angiotensin II, a potent vasoconstrictor that also stimulates release of aldosterone. Results in decrease in BP, reduced sodium reabsorption, and potassium retention.

Uses

Hypertension; heart failure.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased hypotensive effect of fosinopril (decreased prostaglandin synthesis)

- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (1%); taste disturbance.
CNS: Dizziness (12%); weakness (1%).
CVS: Chest pain (2%), hypotension (4%), orthostatic hypotension, syncope (1%).
GI: Diarrhea (2%); nausea, vomiting (1%).
RESP: Cough (10%); URI (2%).
MISC: Musculoskeletal pain (3.3%).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- If coughing is problematic, consider semisupine chair position for treatment.
- Susceptible patient with DM may experience severe recurrent hypoglycemia.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

frovatriptan succinate (froe-va-TRIP-tan SUK-sin-AYT)

Frova

Drug Class: Analgesic, migraine

PHARMACOLOGY

Action

Selectively agonizes 5-hydroxy-tryptamine$_1$ (5-HT$_{1B/1D}$) receptor, inhibiting excessive dilation of extracerebral and intracranial arteries in migraine.

Uses

Acute treatment of migraine attacks with or without aura in adults.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (3%).
CNS: Dizziness (8%); fatigue (5%); headache, paresthesia (4%); dysesthesia, hypoesthesia, insomnia, anxiety (≥1%).
CVS: Chest pain (2%).
GI: Dyspepsia (2%); vomiting, abdominal pain, diarrhea (≥1%).
RESP: Sinusitis, rhinitis (≥1%).
MISC: Hot or cold sensation (3%); pain (≥1%).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP and pulse). Drugs for prevention are sympatholytic; drugs for treatment of acute attack are sympathomimetic.
- If GI side effects occur, consider semisupine chair position.
- This drug is for acute use during migraine attack. Patient is unlikely to present for oral health care appointment.

furosemide (fyu-ROH-se-mide)

Lasix

Apo-Furosemide, Furosemide Special, Lasix Special,

Edenol, Henexal, Selectofur, Zafimida

Drug Class: Loop diuretic

PHARMACOLOGY

Action

Inhibits reabsorption of sodium and chloride in proximal and distal tubules and loop of Henle.

Uses

Treatment of edema associated with CHF, cirrhosis, and renal disease; hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Chloral hydrate: Vasomotor instability (mechanism unknown)
- Avoid concurrent use.

COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

Sympathomimetic amines:
- Use local anesthetic agents containing a vasoconstrictor with caution (hypokalemia with epinephrine).
- Monitor blood pressure, as well as pulse rate and character.

ADVERSE EFFECTS

⚠ **ORAL:** Oral irritation (unspecified); dry mouth, thirst.
CNS: Vertigo; headache; dizziness; paresthesia; restlessness; fever.
CVS: Orthostatic hypotension, thrombophlebitis; irregular heartbeat (hypokalemia).
GI: Anorexia; nausea; vomiting; diarrhea; gastric irritation; cramping; constipation; pancreatitis.
MISC: Muscle spasm; weakness; blood dyscrasias (leukopenia, agranulocytosis, thrombocytopenia, anemia); photosensitivity.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- This drug frequently used to manage symptoms of CHF; determine ability to adapt to stress of dental treatment. Consider short appointments.
- Monitor pulse rhythm to assess for electrolyte imbalance.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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gabapentin (GAB-uh-PEN-tin)

Neurontin: Capsules: 100, 300, 400 mg

Apo-Gabapentin, Novo-Gabapentin, PMS-Gabapentin

Drug Class: Anticonvulsant

PHARMACOLOGY

Action

Mechanism unknown; gabapentin-binding sites have been found in neocortex and hippocampus areas of the brain.

Uses

Adjunctive therapy in treatment of partial seizures with or without secondary generalization in patients older than 12 yr with epilepsy; adjunctive therapy for partial seizures in children 3 to 12 yr; management of postherpetic neuralgia in adults.

Contraindications

Standard considerations.

Usual Dosage

Postherpetic neuralgia

ADULTS: *PO:* Start with a single 300-mg dose on day 1, 600 mg on day 2 (divided bid), and

900 mg on day 3 (divided tid). Subsequently, titrate the dose upward as needed for pain relief to a daily dose of 1800 mg (divided tid).

Pharmacokinetics

ABSORP: Bioavailability is approximately 60%.
DIST: Less than 3% bound to plasma proteins. Vd is about 58 L.
METAB: Not significantly metabolized in humans.
EXCRET: Excreted unchanged in urine. $T_{1/2}$ is 5 to 7 hr.
SPECIAL POP: *Renal failure:* In Ccr less than 30 mL/min, $t_{1/2}$ is about 52 hr. *Hemodialysis:* $T_{1/2}$ is about 132 hr on nondialysis days; gabapentin is significantly removed by hemodialysis.

DRUG INTERACTIONS

Antacids: Possible decreased gabapentin effect (decreased metabolism)
- Monitor clinical status.

Propranolol: Possible increased risk of dystonia (mechanism unknown)
- Monitor clinical status.

Phenytoin: Phenytoin toxicity (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (4.8%) or throat; dental abnormalities (unspecified).
CVS: Hypertension; vasodilation.
CNS: Somnolence; dizziness; ataxia; tremor; nervousness; dysarthria; amnesia; depression; abnormal thinking; twitching; abnormal coordination; vertigo; hyperkinesia; paresthesia; reflex abnormality; hostility; anxiety.
GI: Dyspepsia; increased appetite; anorexia; flatulence.
RESP: Rhinitis; pharyngitis; coughing; pneumonia.
MISC: Fatigue; weight increase; back pain; peripheral edema; impotence; leukopenia; asthenia; malaise; facial edema; arthralgia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Determine level of disease control, type and frequency of seizure, and compliance with medication regimen.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Blood dyscrasias rarely reported; anticipate increased infection and poor healing.

When used or prescribed by DDS:

- *Lactation:* Secreted in breast milk.
- *Children:* Safety and efficacy in children below 3 yr not established; safety and efficacy in management of postherpetic neuralgia in pediatric patients not established.
- *Elderly:* Because of age-related renal impairment, dosage adjustment may be required.
- *Renal failure:* Dose reduction recommended.
- *Carcinogenic:* May have carcinogenic potential.
- *Serious adverse effects:* During clinical trials, some patients experienced status epilepticus, and 8 sudden, unexplained deaths occurred. The association of these events with gabapentin use is unclear.
- *Withdrawal:* Do not discontinue antiepileptic drugs abruptly because of possible increased seizure frequency from drug withdrawal.
- *Overdosage:* Ataxia, labored breathing, ptosis, sedation, hypoactivity or excitation, double vision, slurred speech, drowsiness, lethargy, diarrhea.

Pregnancy Risk Category: Category C.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

- Evaluate manual dexterity; consider need for power toothbrush.

When used or prescribed by DDS:

- Instruct patient to take medication at least 2 hr after taking antacid.
- Explain that missed dose should be taken as soon as remembered but that two doses should not be taken together. Instruct patient to call health care provider if at least two doses are missed.
- Instruct patient to report the following symptoms to health care provider: excessive fatigue or weakness, dizziness, somnolence, incoordination, tremor or other symptoms of CNS depression, change in normal behavior, weight gain, back pain, alterations in GI system, alteration in skin or mucous membranes, fluid retention, general body discomfort, anorexia, visual disturbances, impotence.
- Advise patient that drug may cause drowsiness and to use caution while driving or performing other tasks requiring mental alertness.

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galantamine HBr (gah-LAN-tah-meen HIGH-droe-BRO-mide)

Reminyl

Drug Class: Cholinesterase inhibitor

PHARMACOLOGY

Action

May enhance cholinergic function by increasing acetylcholine.

Uses

Treatment of mild to moderate dementia of the Alzheimer type.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Dizziness; fatigue; headache; tremor; depression; insomnia; somnolence; agitation; confusion; anxiety; hallucinations.

CVS: Bradycardia, syncope (2%).

GI: Nausea; vomiting; anorexia; diarrhea; abdominal pain; dyspepsia; constipation; flatulence.

RESP: Rhinitis; URI; bronchitis; coughing.

MISC: Injury; back pain; peripheral edema; asthenia; falling; thrombocytopenia.

CLINICAL IMPLICATIONS

General

- Patient may experience hypotension or hypertension. Monitor vital signs at each appointment; anticipate syncope.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Ensure that caregiver is present at every dental appointment and understands informed consent.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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gatifloxacin (ga-ti-FLOKS-a-sin)

Zymar

Drug Class: Antibiotic, fluoroquinolone

PHARMACOLOGY

Action

Treatment of infections caused by susceptible strains of the designated microorganism.

Uses

For treatment of bacterial infections, including chronic bronchitis; acute sinusitis; community-acquired pneumonia; uncomplicated and complicated UTIs; pyelonephritis; uncomplicated urethral and cervical gonorrhea; uncomplicated skin and skin structure infections; uncomplicated rectal infections in women; bacterial conjunctivitis (ophthalmic).

Unlabeled Uses

Atypical pneumonia; chronic prostatitis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Glossitis, candidiasis, stomatitis, mouth ulcer, taste perversion (<3%).

CNS: Abnormal dreams; insomnia; paresthesia; tremors; vasodilation; vertigo; agitation; anxiety; confusion; headache; dizziness; asthenia.

CVS: Palpitations (<3%).

GI: Abdominal pain; constipation; dyspepsia; vomiting; nausea; diarrhea; anorexia.

RESP: Dyspnea; pharyngitis.

MISC: Allergic reaction; chills; fever; back pain; chest pain.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.
- If GI side effects occur, consider semisupine chair position.

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gemfibrozil (gem-FIE-broe-ZILL)

Lopid

Apo-Gemfibrozil, Gen-Gemfibrozil, Novo-Gemfibrozil, Nu-Gemfibrozil, PMS-Gemfibrozil

Drug Class: Antihyperlipidemic

PHARMACOLOGY

Action

Decreases blood levels of triglycerides and VLDL by decreasing their production. Also decreases cholesterol and increases HDL.

Uses

Treatment of hypertriglyceridemia in adult patients with type IV or V hyperlipidemia that presents risk of pancreatitis and does not respond to diet; reduction of coronary heart disease risk in type IIb patients who have low HDL levels (in addition to elevated LDL and triglycerides) and have not responded to other measures.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Taste perversion.
CNS: Fatigue; vertigo; headache.
GI: Dyspepsia; abdominal pain; diarrhea; nausea; vomiting; constipation; acute appendicitis.
MISC: Muscle pain or weakness; myositis; rhabdomyolysis; anemia, leukopenia, thrombocytopenia.

CLINICAL IMPLICATIONS

General

- High LDL cholesterol concentration is the major cause of atherosclerosis, which leads to CAD (angina, MI); determine degree of CV health and ability to withstand stress of dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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gemifloxacin mesylate (jeh-mih-FLOKS-ah-sin MEH-sih-LATE)

Factive

Drug Class: Antibiotic, fluoroquinolone

PHARMACOLOGY

Action

Interferes with microbial DNA synthesis.

Uses

Treatment of acute bacterial exacerbation of chronic bronchitis and community-acquired pneumonia (mild to moderate) caused by susceptible strains of designated microorganisms.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Taste disturbance; candidiasis, dry mouth (1%).
CNS: Headache, dizziness (1%).
CVS: Arrhythmias; syncope.
MISC: Leukopenia; thrombocytopenia.
GI: Diarrhea (4%); nausea (3%); vomiting, abdominal pain (1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.

- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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glimepiride (GLIE-meh-pie-ride)

Amaryl

Drug Class: Antidiabetic, sulfonylurea

PHARMACOLOGY

Action

Decreases blood glucose by stimulating insulin release from pancreas. May also decrease hepatic glucose production as well as increase sensitivity to insulin.

Uses

Adjunct to diet and exercise in type 2 diabetic patients whose hyperglycemia cannot be controlled by diet and exercise alone; in combination with insulin for type 2 diabetic patients with secondary failure to oral sulfonylureas.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole: Possible increased risk of hypoglycemia (decreased metabolism)

- Monitor blood sugar.

ADVERSE EFFECTS

⚠ **ORAL:** Thirst; pharyngitis.

CNS: Headache; dizziness.

CVS: Arrhythmia; flushing; hypertension; syncope.

GI: Nausea; vomiting; GI pain; diarrhea.

RESP: Dyspnea.

MISC: Asthenia; hyponatremia with or without syndrome of inappropriate antidiuretic hormone (SIADH); hypoglycemia; photosensitivity; leukopenia; thrombocytopenia; agranulocytosis; aplastic and hemolytic anemia.

CLINICAL IMPLICATIONS

General

- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels >8% indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated.
- Monitor blood pressure because hypertension and dyslipidemia (CAD) are prevalent in DM.
- *Loss of blood sugar control:* certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Observe for signs of hypoglycemia (e.g., confusion, argumentativeness, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- Ensure patient has taken medication and eaten meal.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin or Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.

- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- Medical consult advised if fasting blood glucose is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- *If insulin is used:* Consider time of peak hypoglycemic effect.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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glipizide (GLIP-ih-zide)

Glucotrol, Glucotrol XL

Glupitel, Minodiab

Drug Class: Antidiabetic, sulfonylurea

PHARMACOLOGY

Action

Decreases blood glucose by stimulating insulin release from pancreas and by increasing tissue sensitivity to insulin.

Uses

Adjunct to diet to lower blood glucose in patients with type 2 diabetes mellitus whose hyperglycemia cannot be controlled by diet alone.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole: Hypoglycemia (decreased metabolism of glipizide)
- Monitor blood sugar.

ADVERSE EFFECTS

⚠ **ORAL:** Thirst; pharyngitis.
CNS: Dizziness; vertigo.
CVS: Arrhythmia; flushing; hypertension; syncope.
GI: GI disturbances (e.g., nausea, epigastric fullness, heartburn); diarrhea.
RESP: Dyspnea.
MISC: Disulfiram-like reaction; weakness; paresthesia; fatigue; malaise; hypoglycemia; photosensitivity; leukopenia; thrombocytopenia; agranulocytosis; aplastic and hemolytic anemia.

CLINICAL IMPLICATIONS

General

- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated.
- Monitor blood pressure because hypertension and dyslipidemia (CAD) are prevalent in DM.
- *Loss of blood sugar control:* certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.

- Observe for signs of hypoglycemia (e.g., confusion, argumentativeness, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- Ensure patient has taken medication and eaten meal.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin or Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- Medical consult advised if fasting blood glucose is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- *If insulin is used:* Consider time of peak hypoglycemic effect.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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glipizide/metformin HCl (GLIP-ih-zide/met-FORE-min HIGH-droe-KLOR-ide)

Synonym: metformin HCl/glipizide

Metaglip

Drug Class: Antidiabetic combination, sulfonylurea and biguanide

PHARMACOLOGY

Action

GLIPIZIDE: Decreases blood glucose by stimulating insulin release from pancreas and by increasing tissue sensitivity to insulin.

METFORMIN: Decreases blood glucose by reducing hepatic glucose production and may decrease intestinal absorption of glucose and increase response to insulin.

Uses

Initial treatment as an adjunct to diet and exercise, to improve glycemic control in patients with type 2 diabetes whose hyperglycemia cannot be satisfactorily managed with diet and exercise alone; second-line therapy when diet, exercise, and initial treatment with a sulfonylurea or metformin do not result in adequate glycemic control in patients with type 2 diabetes.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole: Hypoglycemia (decreased metabolism of glipizide)

- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Thirst; pharyngitis.

CVS: Hypertension (>5%).

CNS: Dizziness, headache (>5%).

GI: Diarrhea, nausea, vomiting, abdominal pain (>5%).

RESP: URI (>5%).

MISC: Musculoskeletal pain (>5%).

CLINICAL IMPLICATIONS

General

- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated.
- Monitor blood pressure because hypertension and dyslipidemia (CAD) are prevalent in diabetes mellitus.
- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Observe for signs of hypoglycemia (e.g., confusion, argumentativeness, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- Ensure patient has taken medication and eaten meal.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin or Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- Determine ability to adapt to stress of dental treatment. Consider short morning appointments.
- Medical consult advised if fasting blood glucose (FBG) is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- *If insulin is used:* Consider time of peak hypoglycemic effect.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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glucagon (GLUE-kuh-gahn)

GlucaGen, Glucagon Emergency Kit, Glucagon Diagnostic Kit: Powder for injection: 1 mg (1 unit)

Drug Class: Glucose-elevating agent

PHARMACOLOGY

Action

Elevates blood glucose concentrations (by stimulating production from liver glycogen stores), relaxes smooth muscle of GI tract, decreases gastric and pancreatic secretions in GI tract, and increases myocardial contractility.

Uses

Treatment of severe hypoglycemic reactions in diabetic patients when glucose administration is not possible or during insulin shock therapy in psychiatric patients; diagnostic aid in radiological examination of stomach, duodenum, small bowel, and colon when diminished intestinal motility would be advantageous.

GLUCAGEN: Treatment of severe hypoglycemic reactions that may occur in patients with diabetes treated with insulin; as a diagnostic aid during radiological examinations to temporarily inhibit movement of the GI tract.

Unlabeled Uses

Treatment of propranolol overdose, CV emergencies, and GI disturbances associated with spasms.

Contraindications

Patients with pheochromocytoma or insulinoma; hypersensitivity to any component of the product.

Usual Dosage

Hypoglycemia

ADULTS AND CHILDREN MORE THAN 20 KG: *Subcutaneous/IM/IV:* 1 mg (1 unit). Do not use glucagon at concentrations above 1 mg/mL (1 unit/mL).
CHILDREN LESS THAN 20 KG: *Subcutaneous/IM/IV:* 0.5 mg (0.5 unit) or a dose equivalent to 20 to 30 mcg/kg.

GlucaGen

ADULTS AND CHILDREN WEIGHING 25 KG OR MORE: *Subcutaneous/IM/IV:* 1 mg.
CHILDREN WEIGHING LESS THAN 25 KG OR YOUNGER THAN 8 YR OF AGE: *Subcutaneous/IM/IV:* 0.5 mg. Emergency assistance should be sought if patient fails to respond within 15 min after subcutaneous or IM injection of glucagon. The glucagon injection may be repeated while waiting for emergency assistance. IV glucose must be administered if patient fails to respond to glucagon. When the patient has responded, give oral carbohydrate to restore liver glycogen and prevent recurrence of hypoglycemia.

Pharmacokinetics

ABSORP: Mean C_{max} is 1,686 pg/mL (IM). Median T_{max} is 12.5 min (IM).
METAB: Degraded in liver, kidney, and plasma.
EXCRET: Mean apparent $t_{1/2}$ 45 min (IM).
ONSET: 10 min.
PEAK: 30 min.

DRUG INTERACTIONS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CVS: Transient increase in BP and pulse rate; positive inotropic and chronotropic effects (tachycardia).
GI: Nausea; vomiting.
MISC: Generalized allergic reactions, (e.g., urticaria, respiratory distress, hypotension).

CLINICAL IMPLICATIONS

General

- This drug is used to manage hypoglycemia when patient is unconscious and is given parenterally.
- *Children:* TREATMENT OF HYPOGLYCEMIA: Glucagon has been shown to be safe and effective. HYPOGLYCEMIA: Glucagon is effective in treating hypoglycemia only if sufficient liver glycogen is present. Because glucagon is of little or no help in states of starvation, adrenal insufficiency, or chronic hypoglycemia, treat hypoglycemia in these conditions with glucose.
- *Overdosage:* Nausea, vomiting, gastric hypotonicity, diarrhea without consequential toxicity, increased BP and pulse rate.

Pregnancy Risk Category: Category B.

Oral Health Education

When used by DDS:

- Educate patient and family members regarding the risks of prolonged hypoglycemia and the need to arouse the hypoglycemic patient as rapidly as possible.

- Instruct patient or family members to monitor fingerstick blood sugars frequently when treating hypoglycemia until the patient is asymptomatic. Advise family members to call 911 if patient has not responded within 15 min of injection and to administer second dose of glucagon while awaiting emergency assistance.
- Instruct patient and family members that supplemental carbohydrates must be given as soon as the patient awakens and is able to swallow.
- Advise patient to inform health care provider when hypoglycemic reactions occur so that the treatment regimen may be adjusted if necessary.
- Instruct patient and family members regarding the following measures that may prevent or be used to rapidly treat hypoglycemic reactions caused by insulin: reasonable uniformity from day to day with regard to diet, insulin dose, and exercise; careful adjustment of insulin program; frequent monitoring of fingerstick blood sugars so that a change in insulin requirements can be foreseen; carrying sugar, candy, or other readily absorbable carbohydrate at all times so that it may be taken at the first warning of an oncoming hypoglycemic reaction.
- Caution patient not to take any prescription or OTC drugs, dietary supplements, or herbal preparations unless advised by health care provider.
- Advise patient that follow-up visits and laboratory tests may be necessary to monitor therapy and to keep appointments.

glyburide (glie-BYOO-ride)

DiaBeta, Glynase PresTab, Micronase

Apo-Glyburide, Euglucon, Gen-Glybe, Novo-Glyburide, Nu-Glyburide, PMS-Glyburide, ratio-Glyburide

Daonil, Euglucon, Gilbenil, Glucal, Glucoven, Nadib, Norboral

Drug Class: Antidiabetic, sulfonylurea

PHARMACOLOGY

Action

Decreases blood glucose by stimulating insulin release from pancreas. May also decrease hepatic glucose production or increased response to insulin.

Uses

Adjunct to diet to lower blood glucose in patients with type 2 diabetes mellitus (DM) whose hyperglycemia cannot be controlled by diet alone; in combination with metformin when diet and glyburide or diet and metformin alone do not result in adequate glycemic control.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Thirst; pharyngitis.
CNS: Dizziness; vertigo.
CVS: Arrhythmia; flushing; hypertension; syncope.
GI: Nausea; epigastric fullness; heartburn.
RESP: Dyspnea.
MISC: Disulfiram-like reactions; weakness; paresthesia; fatigue; malaise; hypoglycemia; photosensitivity; leukopenia, thrombocytopenia, agranulocytosis, aplastic and hemolytic anemia.

CLINICAL IMPLICATIONS

General

- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C $<7\%$. A1C levels $\geq 8\%$ indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated.

- Monitor blood pressure because hypertension and dyslipidemia (CAD) are prevalent in DM.
- *Loss of blood sugar control:* certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Observe for signs of hypoglycemia (e.g., confusion, argumentativeness, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- Ensure patient has taken medication and eaten meal.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin or Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- Determine ability to adapt to stress of dental treatment. Consider short morning appointments.
- Medical consult advised if fasting blood glucose is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- *If insulin is used:* Consider time of peak hypoglycemic effect.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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glyburide/metformin HCl (glie-BYOO-ride/met-FORE-min HIGH-droe-KLOR-ide)

Synonym: metformin HCl/glyburide

Glucovance

Drug Class: Antidiabetic combination, sulfonylurea and biguanide

PHARMACOLOGY

Action

GLYBURIDE: Decreases blood glucose by stimulating insulin release from pancreas and may decrease hepatic glucose production or increase response to insulin.

METFORMIN: Decreases blood glucose by decreasing hepatic glucose production and may decrease intestinal absorption of glucose and increase response to insulin.

Uses

Adjunct to diet and exercise to improve glycemic control in patients with type 2 diabetes whose hyperglycemia cannot be satisfactorily managed by diet and exercise alone; second-line therapy when diet, exercise, and initial treatment with a sulfonylurea or metformin do not result in adequate glycemic control in patients with type 2 diabetes.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Headache, dizziness (>5%).
GI: Diarrhea, nausea, vomiting, abdominal pain (7% to 17%).
RESP: URI (17%); hypoglycemia (6.8%).

CLINICAL IMPLICATIONS

General

- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated.
- Monitor blood pressure because hypertension and dyslipidemia (CAD) are prevalent in DM.
- *Loss of blood sugar control:* certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Observe for signs of hypoglycemia (e.g., confusion, argumentativeness, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- Ensure patient has taken medication and eaten meal.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin or Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- Determine ability to adapt to stress of dental treatment. Consider short morning appointments.
- Medical consult advised if fasting blood glucose is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- *If insulin is used:* Consider time of peak hypoglycemic effect.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.

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glycopyrrolate (glie-koe-PIE-row-late)

Robinul: Tablets: 1 mg; Injection: 0.2 mg/mL
Robinul Forte: Tablets: 2 mg

Drug Class: Antispasmodic, Quaternary

PHARMACOLOGY

Action

Exerts anticholinergic effects, resulting in GI smooth muscle relaxation; diminished volume and acidity of GI secretions; and reduced pharyngeal, tracheal, and bronchial secretions.

Uses

ORAL: Adjunctive treatment of peptic ulcer.
PARENTERAL: Preoperative administration for reduction of salivary, tracheobronchial, and pharyngeal secretions; reduction of volume and acidity of gastric secretions; and blockade of cardiac vagal inhibitory reflexes before and during induction of anesthesia and intubation. Intraoperative administration for counteraction of drug-induced or vagal traction reflexes with associated arrhythmias.

Contraindications

Narrow angle glaucoma; adhesions between iris and lens; obstructive uropathy; obstructive disease of GI tract; paralytic ileus; intestinal atony of elderly or debilitated patients; severe ulcerative colitis; toxic megacolon complicating ulcerative colitis; hepatic or renal disease; tachycardia; myocardial ischemia; unstable cardiovascular status in acute hemorrhage; myasthenia gravis.

Usual Dosage

Peptic ulcer

ADULTS AND CHILDREN OLDER THAN 12 YR OF AGE: PO 1 to 2 mg 2 or 3 times daily. IM/IV 0.1 to 0.2 mg 3 or 4 times daily.

Preanesthetic medication

ADULTS: IM 0.004 mg/kg 20 min to 1 h prior to anesthesia.
CHILDREN YOUNGER THAN 12 YR OF AGE: IM 0.0044 to 0.0088 mg/kg.
CHILDREN YOUNGER THAN 2 YR OF AGE: IM up to 0.0044 mg/kg.

Intraoperative medication

ADULTS: IV 0.1 mg. May repeat at 2- to 3-min intervals.
CHILDREN: IV 0.004 mg/kg (max 0.1 mg in single dose); may repeat at 2- to 3-min intervals.

Reversal of neuromuscular blockade

ADULTS AND CHILDREN: IV 0.2 mg for each 1 mg neostigmine or 5 mg pyridostigmine. Administer simultaneously.

Pharmacokinetics

ABSORP: Absorption is poor and unreliable.

DIST: Highly polar ammonium group of glycopyrrolate limits its passage across blood-brain barrier and other lipid membranes.

ONSET: Within 1 min after IV injection.

PEAK: 30 to 45 min after IM administration.

DURATION: Vagal blocking effects persist for 2 to 3 h. Antisialagogue effects persist up to 7 h.

DRUG INTERACTIONS

Sympathomimetic amines: Tachycardia with glycopyrrolate (autonomic imbalance)

- Monitor vital signs.
- Use local anesthetic agents containing a vasoconstrictor with caution.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; altered taste perception.

CVS: Palpitations; tachycardia; orthostatic hypotension.

CNS: Headache; flushing; nervousness; drowsiness; weakness; dizziness; confusion; insomnia; fever (especially in children); mental confusion or excitement (especially in elderly, even with small doses); CNS stimulation (restlessness, tremor, hallucinations).

GI: Nausea; vomiting; dysphagia; heartburn; constipation; bloated feeling; paralytic ileus.

MISC: Suppression of lactation; decreased sweating; blurred vision.

CLINICAL IMPLICATIONS

General

When prescribed by medical facility:

- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several minutes at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- *Consultation:* Physician should be informed if significant xerostomic side effects occur so that alternate medication can be considered.

When prescribed by DDS:
- Ensure patient knows how to take the drug, how long it should be taken, and to immediately report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset).
- *Lactation:* Undetermined.
- *Children:* Not recommended for treatment of peptic ulcer in children younger than 12 years of age.
- *Elderly:* May react with excitement, agitation, drowsiness, and other untoward manifestations even with small doses.
- *Special-Risk:* Use with caution in patients with autonomic neuropathy, hepatic or renal disease, ulcerative colitis, hyperthyroidism, coronary heart disease, CHF, cardiac tachyarrhythmias, hypertension, prostatic hypertrophy, hiatal hernia associated with reflux esophagitis.
- *Anticholinergic psychosis:* Reported in sensitive individuals; may include confusion, disorientation, short-term memory loss, hallucinations, dysarthria, ataxia, coma, euphoria, anxiety, fatigue, insomnia, agitation, and inappropriate affect.
- *Diarrhea:* May be symptom of incomplete intestinal obstruction, especially in patients with ileostomy or colostomy. Treatment of diarrhea with drug is inappropriate and possibly harmful.
- *Gastric ulcer:* May delay gastric emptying rate and complicate therapy.
- *Heat prostration:* Can occur in presence of high environmental temperature.
- *Overdosage:* Dry mouth, thirst, vomiting, nausea, abdominal distention, difficulty swallowing, muscular weakness, paralysis, fever, coma, circulatory failure, rapid pulse and respiration, vasodilation, tachycardia with weak pulse, hypertension, hypotension, respiratory depression, palpitations.

Pregnancy Risk Category: Category B.

Oral Health Education
- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.

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gold sodium thiomalate (gold SO-dee-uhm thigh-oh-MAL-ate)

Aurolate

Drug Class: Anti-inflammatory; Antirheumatic; Gold compound

PHARMACOLOGY

Action
Mechanism unknown; suppresses symptoms of rheumatoid arthritis and may slow progression of this disease.

Uses
Symptomatic relief of active adult and juvenile rheumatoid arthritis not adequately controlled by other therapies.

Unlabeled Uses
Treatment of pemphigus and psoriatic arthritis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Naproxen: Pneumonitis (possible hypersensitivity to gold-naproxen)
- Avoid concurrent use.

ADVERSE EFFECTS
May occur months after therapy is discontinued.

⚠ **ORAL:** Difficulty swallowing, stomatitis (13%), glossitis; gingivitis; metallic taste.

GI: Diarrhea; nausea; cholestatic jaundice; ulcerative enterocolitis; GI bleeding; abdominal pain and cramping.

RESP: Interstitial pneumonitis; pulmonary fibrosis.

CNS: Confusion; hallucinations.

CVS: "Nitritoid reaction" (e.g., vasomotor reaction with flushing, fainting, weakness, dizziness, sweating, nausea, vomiting, malaise, headache).

MISC: Anaphylactoid reactions within min of injection, arthralgias for several days after injection; thrombocytopenia, anemia, leukopenia, eosinophilia (1% to 3%)

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Use COX inhibitors with caution; they may exacerbate PUD and GERD.
- *Arthritis:* Consider patient comfort and need for semisupine chair position.
- Blood dyscrasias reported; anticipate increased bleeding, infection, and poor healing.
- If GI side effects occur, consider semisupine chair position.
- Advise products for palliative relief if oral manifestations develop (e.g., stomatitis, mucositis, xerostomia).

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.
- Evaluate manual dexterity; consider need for power toothbrush.

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guaifenesin (GWHY-fen-ah-sin)

Synonym: glyceryl guaiacolate

Allfen Jr, Anti-Tuss, Breonesin, Diabetic Tussin EX, Duratuss-G, Fenesin, Gee-Gee, Genatuss, GG-Cen, Glyate, Glycotuss, Glytuss, GuiaCough CF, GuiaCough PE, Guiatuss, Humibid LA, Humibid Sprinkle, Liquibid, Monafed, Mucinex, Muco-Fen-LA, Mytussin, Naldecon Senior EX, Organidin NR, Pneumomist, Robitussin, Scot-tussin Expectorant, Siltussin SA, Sinumist-SR Capsulets, Tusibron, Tussin, Uni-tussin

 **Balminil Expectorant, Benylin E Extra Strength, Robitussin Extra Strength**

 **Formula E, Tukol**

Drug Class: Expectorant

PHARMACOLOGY

Action

May enhance output of respiratory tract fluid by reducing adhesiveness and surface tension, thus facilitating removal of viscous mucus and making nonproductive coughs more productive and less frequent. Efficacy not well documented.

Uses

Temporary relief of cough associated with respiratory tract infections and related conditions (such as sinusitis, pharyngitis, bronchitis, and asthma) when these conditions are complicated by tenacious mucous or mucous plugs and congestion; effective for productive and nonproductive cough, particularly dry, nonproductive cough that tends to injure mucous membranes of the air passages; helps loosen phlegm and thin bronchial secretions in patients with stable chronic bronchitis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Dizziness; headache.

GI: Nausea; vomiting.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- Monitor respiratory function; uncontrolled respiratory disease is characterized by wheezing, coughing.
- Consider semisupine chair position to assist respiratory function.

guanabenz acetate (GWAHN-uh-benz ASS-uh-TATE)

Wytensin

Drug Class: Antihypertensive; Antiadrenergic, centrally acting

PHARMACOLOGY

Action

Appears to stimulate central alpha$_2$-adrenergic receptors, inhibiting sympathetic outflow from brain to peripheral circulation.

Uses

Treatment of hypertension alone or with a thiazide diuretic.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (28% to 38%); taste disorder.
CNS: Drowsiness; sedation; dizziness; anxiety; ataxia; depression; sleep disturbances.
CVS: Chest pain; arrhythmia; palpitations.
GI: Constipation; diarrhea; nausea; vomiting; abdominal discomfort.
RESP: Dyspnea.
MISC: Gynecomastia; muscle or joint pain; weakness.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

guanadrel (GWAHN-uh-drell)

Hylorel

Drug Class: Antihypertensive; Antiadrenergic, peripherally acting

PHARMACOLOGY

Action

Inhibits vasoconstriction by restraining norepinephrine release from nerve storage sites; depletion of norepinephrine causes relaxation of vascular smooth muscle, decreasing total peripheral resistance and venous return.

Uses
Treatment of hypertension in patients not responding adequately to thiazide-type diuretics.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Sympathomimetic amines: Decreased antihypertensive effect (pharmacological antagonism)
- Use local anesthetic agents containing a vasoconstrictor with caution.
- Monitor blood pressure.

ADVERSE EFFECTS
⚠ **ORAL:** Glossitis (8%), dry mouth (2%).

CNS: Fatigue; headache; faintness; drowsiness; paresthesias; confusion; depression; sleep disorders.

CVS: Palpitations, chest pain (28% to 30%), orthostatic hypotension (47%), syncope.

GI: Increased bowel movements; gas pain/indigestion; constipation; anorexia; nausea or vomiting; abdominal distress or pain.

RESP: Shortness of breath; coughing.

MISC: Excessive weight loss or gain; aching limbs; leg cramps; back or neck ache; joint pain or inflammation; gangrene.

CLINICAL IMPLICATIONS
General
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI or musculoskeletal side effects occur, consider semisupine chair position.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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guanethidine monosulfate (gwahn-ETH-ih-deen MAH-no-SULL-fate)
Ismelin

Drug Class: Antiadrenergic, peripherally acting

PHARMACOLOGY
Action
Interferes with release or distribution of norepinephrine from nerve endings, resulting in reduction in total peripheral resistance and diastolic and systolic BP.

Uses
Treatment of moderate and severe hypertension and renal hypertension, including that secondary to pyelonephritis, renal amyloidosis, and renal artery stenosis.

Unlabeled Uses
Reflex sympathetic dystrophy and causalgia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Sympathomimetic amines: Decreased antihypertensive effect (physiologic antagonism)

- Monitor vital signs.
- Use local anesthetic agents with vasoconstrictor with caution.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; parotid tenderness.

CVS: Bradycardia; orthostatic fluid retention; edema; angina.

CNS: Dizziness; weakness; lassitude; syncope; fatigue; muscle tremor; mental depression; chest paresthesias; ptosis; headache; confusion.

GI: Nausea; vomiting; diarrhea (may be severe, requiring discontinuation of therapy); increase in bowel movements.

RESP: Dyspnea; asthma in susceptible individuals.

MISC: Myalgia; weight gain; dermatitis; scalp hair loss; leg cramps.

CLINICAL IMPLICATIONS

General

- Patients taking this drug have significant CV disease. Medical consult to determine patient's ability to withstand stress of dental treatment is recommended.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Use cardiac dose of vasoconstrictor (no more than 2 cartridges of 1:100,000 or 4 cartridges of 1:200,000). Use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries activity, candidiasis, and lichenoid mucositis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several minutes at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients with cardiovascular disease.
- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.

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guanfacine HCl (GWAHN-fay-seen HIGH-droe-KLOR-ide)

Tenex

Drug Class: Antihypertensive; Antiadrenergic, centrally acting

PHARMACOLOGY

Action

Appears to stimulate central alpha$_2$-adrenergic receptors, with decreased sympathetic outflow causing decrease in peripheral vascular resistance and reduction in heart rate.

Uses

Treatment of hypertension.

Unlabeled Uses

Amelioration of heroin withdrawal symptoms.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (10% to 54%, dose dependent).
CNS: Somnolence; drowsiness; dizziness; headache; sleep disturbances; insomnia; confusion; depression.
CVS: Postural hypotension; syncope; palpitations.
GI: Constipation; diarrhea; nausea; abdominal discomfort; dyspnea.
MISC: Paresthesia; paresis; leg cramps; hypokinesia.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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halcinonide (hal-SIN-oh-nide)

Halog-E

Dermalog

Drug Class: Corticosteroid, topical

PHARMACOLOGY

Action

Produces anti-inflammatory, antipruritic, and vasoconstrictive effects by an unknown mechanism.

Uses

Relief of inflammation and pruritus caused by corticosteroid-responsive dermatoses.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dryness; mucosal atrophy; stinging and cracking of skin.
MISC: Numbness of fingers; local skin reactions.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.

- Due to the anticipated perioperative physiological stress (i.e., minor surgical stress), patients undergoing dental care under local anesthesia should take only their usual daily glucocorticoid dose before dental intervention. No supplementation is justified.
- Anticipate oral candidiasis when steroids are used.

halobetasol propionate (hal-oh-BAY-ta-sol PROE-pie-OH-nayt)

Ultravate

Drug Class: Corticosteroid, topical

PHARMACOLOGY

Action

Very high potency topical glucocorticoid with anti-inflammatory, antipruritic, and vasoconstrictive properties. Thought to act by inducing phospholipase A_2 inhibitory proteins, thus controlling biosynthesis of potent mediators of inflammation.

Uses

Relief of inflammatory and pruritic manifestations of corticosteroid-responsive dermatoses.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Perioral dermatitis; itching; mucosal thinning.

MISC: Burning; stinging; local tissue reactions.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Due to the anticipated perioperative physiological stress (i.e., minor surgical stress), patients undergoing dental care under local anesthesia should take only their usual daily glucocorticoid dose before dental intervention. No supplementation is justified.
- Anticipate oral candidiasis when steroids are used.

haloperidol (HAL-oh-pehr-i-dahl)

(haloperidol decanoate)

Apo-Haloperidol, Apo-Haloperidol Decanoate Injection, Haloperidol-LA Omega, Novo-Peridol, PMS-Haloperidol LA, ratio-Haloperidol

Drug Class: Antipsychotic, butyrophenone

PHARMACOLOGY

Action

Has antipsychotic effect, apparently caused by dopamine-receptor blockage in CNS.

Uses

Management of psychotic disorders; control of Tourette disorder in children and adults; management of severe behavioral problems in children; short-term treatment of hyperactive children. Long-term antipsychotic therapy (haloperidol decanoate).

Unlabeled Uses

Treatment of phencyclidine (PCP) psychosis; antiemetic; hiccups.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Itraconazole: Possible haloperidol toxicity (decreased metabolism)

- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, tardive dyskinesia; hypersalivation.

CNS: Tardive dystonia; insomnia; restlessness; anxiety; euphoria; agitation; drowsiness; depression; lethargy; headache; confusion; vertigo; seizures; exacerbation of psychotic symptoms; pseudoparkinsonism (e.g., mask-like face, drooling, pill-rolling gestures, shuffling gait, inertia, tremors, cogwheel rigidity); muscle spasms; dyskinesia; akathisia; oculogyric crises; opisthotonos; hyperreflexia.

CVS: Hypertension or hypotension, arrhythmia, tachycardia.

GI: Dyspepsia; anorexia; diarrhea; nausea; vomiting; elevated prolactin levels; adynamic ileus (may lead to death).

RESP: Laryngospasm; bronchospasm; increased depth of respiration; bronchopneumonia.

MISC: Hyperglycemia; hypoglycemia; hyponatremia; photosensitivity; leukocytosis, leukopenia, agranulocytosis.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs.
- *Geriatric patients:* Use lower dose of opioid.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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hydralazine HCl (high-DRAL-uh-zeen HIGH-droe-KLOR-ide)

Apresoline

Nu-Hydral, Novo-Hylazin, Apo-Hydralazine

Apresolina

Drug Class: Antihypertensive; Vasodilator

PHARMACOLOGY

Action

Directly relaxes vascular smooth muscle to cause peripheral vasodilation, decreasing arterial BP and peripheral vascular resistance.

Uses

Treatment of essential hypertension (oral form). Treatment of severe essential hypertension (parenteral form).

Unlabeled Uses

Reduction of overload in treatment of CHF, severe aortic insufficiency, and after valve replacement.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Headache; peripheral neuritis with paresthesias, numbness and tingling; dizziness; tremors; depression; disorientation; anxiety.

CVS: Palpitations, tachycardia; hypotension, flushing.

GI: Anorexia; nausea; vomiting; diarrhea; constipation.

RESP: Nasal congestion; dyspnea.

MISC: Hypersensitivity (e.g., rash, urticaria, pruritus, fever, chills, arthralgia, eosinophilia); systemic lupus erythematosus; blood dyscrasias (e.g., reduced hemoglobin, reduced RBC, agranulocytosis, thrombocytopenia, leukopenia).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

hydrochlorothiazide (HIGH-droe-klor-oh-THIGH-uh-zide)

Ezide, Hydro-DIURIL, Hydro-Par, Microzide

Apo-Hydro, Urozide

Diclotride

Drug Class: Thiazide diuretic

PHARMACOLOGY

Action

Enhances excretion of sodium, chloride, and water by interfering with transport of sodium ions across renal tubular epithelium.

Uses

Adjunctive therapy for edema associated with CHF, cirrhosis, renal dysfunction, and corticosteroid and estrogen therapy; treatment of hypertension.

Unlabeled Uses

Prevention of formation and recurrence of calcium nephrolithiasis; therapy for nephrogenic diabetes insipidus.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased antihypertensive effect (reduced prostaglandin synthesis)

- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Sialoadenitis.

CNS: Dizziness; lightheadedness; vertigo; headache; paresthesias; weakness; restlessness; insomnia.

CVS: Orthostatic hypotension; arrhythmia.

GI: Anorexia; gastric irritation; nausea; vomiting; abdominal pain or cramping; bloating; diarrhea; constipation; pancreatitis.

RESP: Respiratory distress; pneumonitis; pulmonary edema.

MISC: Muscle cramp or spasm; fever; anaphylactic reactions photosensitivity; electrolyte imbalance; blood dyscrasias (e.g., leukopenia, thrombocytopenia, agranulocytosis, aplastic and hemolytic anemias).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Monitor pulse rhythm to assess for electrolyte imbalance.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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hydrocortisone (HIGH-droe-CORE-tih-sone)

(hydrocortisone acetate, hydrocortisone buteprate, hydrocortisone butyrate, hydrocortisone cypionate, hydrocortisone phosphate, hydrocortisone sodium succinate, hydrocortisone valerate)

Synonym: cortisol

A-Hydrocort, Ala-Cort, Ala-Scalp, Anucort-HC, Anumed HC, Anusol HC-1 Hydrocortisone Anti-Itch, Anusol-HC, Caldecort Hydrocortisone Anti-Itch, Cetacort, CortaGel Extra Strength, Cortaid Maximum Strength, Cortaid Topical Spray, Cortaid with Aloe, Cort-Dome, Cortef, Cortenema, Cortizone-10 Quickshot Spray, Cortizone for Kids, Cortizone-10, Cortizone-10 Plus Maximum Strength, Dermacort, Dermol HC, Dermtex HC Maximum Strength Spray, Gynecort 10 Extra Strength, Hemorrhoidal HC, Hemril-HC Uniserts, Hi-Cor 1.0, Hi-Cor 2.5, Hydrocortisone Phosphate, KeriCort-10, LactiCare-HC, Lanacort 10, Lanacort 5, Lanacort Maximum Strength Cool Creme, Locoid, Nutracort, Pandel, Penecort, Proctocort, ProctoCream-HC, Scalpicin, Solu-Cortef, S-T Cort, T/Scalp, U-Cort, Westcort

Aquacort, Claritin Skin Itch Relief, Cortoderm, Emo-Cort, Hyderm, HydroVal, Prevex HC, Sarna HC, Texacort, Uromol HC

Drug Class: Corticosteroid

PHARMACOLOGY

Action

Short-acting glucocorticoid that depresses formation, release, and activity of endogenous mediators of inflammation including prostaglandins, kinins, histamine, liposomal enzymes, and complement system. Also modifies body's immune response.

Uses

Treatment of primary or secondary adrenal cortex insufficiency, rheumatic disorders, collagen diseases, dermatological diseases, allergic states, allergic and inflammatory ophthalmic processes, respiratory diseases, hematological disorders (e.g., idiopathic thrombocyto-

penic purpura), neoplastic diseases, edematous states (resulting from nephrotic syndrome), GI diseases (e.g., ulcerative colitis and sprue), multiple sclerosis, tuberculous meningitis, trichinosis with neurological or myocardial involvement.
INTRA-ARTICULAR OR SOFT-TISSUE ADMINISTRATION: Treatment of synovitis of osteoarthritis and symptoms of rheumatoid arthritis, bursitis, acute gouty arthritis, epicondylitis, acute nonspecific tenosynovitis, and posttraumatic osteoarthritis.
INTRALESIONAL ADMINISTRATION: Treatment of keloids, lesions of lichen planus, psoriatic plaques, granuloma annulare, lichen simplex chronicus, discoid lupus erythematosus, necrobiosis lipoidica diabeticorum, alopecia areata, and cystic tumors of aponeurosis or tendon.
TOPICAL ADMINISTRATION: Treatment of inflammatory and pruritic manifestations of corticosteroid-responsive dermatoses; management of refractory lesions of psoriasis and other deep-seated dermatoses.
RECTAL ADMINISTRATION: Relief of discomfort associated with hemorrhoids, perianal itching, or irritation.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Midazolam: Possible decreased midazolam effect (increased metabolism)
- Monitor clinical status.

COX-1 inhibitors: Increased risk of peptic ulcers (additive)
- Avoid concurrent use.

H

ADVERSE EFFECTS

⚠ **ORAL:** Topical: Burning, itching, dryness; topical use may cause same adverse reactions seen with systemic use because of possibility of absorption.

CNS: Convulsions; increased intracranial pressure with papilledema (pseudotumor cerebri); vertigo; headache; neuritis; paresthesias; psychosis.

GI: Pancreatitis; abdominal distension; ulcerative esophagitis; nausea; vomiting; increased appetite and weight gain; peptic ulcer with perforation and hemorrhage; bowel perforation.

MISC: Musculoskeletal effects (e.g., weakness, myopathy, muscle mass loss, osteoporosis, spontaneous fractures); endocrine abnormalities (e.g., menstrual irregularities, cushingoid state, growth suppression in children, sweating, decreased carbohydrate tolerance, hyperglycemia, glycosuria, increased insulin or sulfonylurea requirements in diabetic patients); anaphylactoid or hypersensitivity reactions; aggravation or masking of infections; malaise; fatigue; insomnia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Despite the anticipated perioperative physiological stress (i.e., minor surgical stress), patients undergoing dental care under local anesthesia should take only their usual daily glucocorticoid dose before dental intervention. No supplementation is justified.
- Anticipate oral candidiasis when steroids are used.

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hydromorphone HCl (HIGH-droe-MORE-phone HIGH-droe-KLOR-ide)

Dilaudid, Dilaudid-HP

Dilaudid-HP Plus, Dilaudid Sterile Powder, Dilaudid-XP, Hydromorph Contin, Hydromorphone HP 10, Hydromorphone HP 20, Hydromorphone HP 50, Hydromorphone HP Forte, PMS-Hydromorphone

Drug Class: Analgesic, narcotic

DEA Schedule: Schedule II

PHARMACOLOGY

Action

Relieves pain by stimulating opiate receptors in CNS; also causes respiratory depression, inhibition of cough reflex, peripheral vasodilation, inhibition of intestinal peristalsis, sphincter of Oddi spasm, stimulation of chemoreceptors that cause vomiting, and increased bladder tone.

Uses

Relief of moderate to severe pain; control of persistent nonproductive cough.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Bupivacaine: Possible respiratory depression (mechanism unknown)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CVS: Hypotension; orthostatic hypotension; bradycardia; tachycardia.

CNS: Lightheadedness; dizziness; sedation; disorientation; incoordination; lethargy; anxiety.

GI: Nausea; vomiting; constipation; abdominal pain.

RESP: Respiratory depression; laryngospasm; depression of cough reflex.

MISC: Tolerance; psychological and physical dependence with long-term use.

CLINICAL IMPLICATIONS

General

- *Drug dependence:* Hydromorphone has abuse potential.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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hydroxychloroquine sulfate (high-drox-ee-KLOR-oh-kwin SULL-fate)

Plaquenil

Drug Class: Anti-infective; Antimalarial; Antirheumatic

PHARMACOLOGY

Action

May interfere with parasitic nucleoprotein (DNA/RNA) synthesis and parasite growth or cause lysis of parasite or infected erythrocytes. In rheumatoid arthritis, may suppress formation of antigens responsible for symptom-producing hypersensitivity reactions.

Uses

Prophylaxis and treatment of acute attacks of malaria caused by *Plasmodium vivax*, *P. malariae*, *P. ovale*, and susceptible strains of *P. falciparum*. Treatment of chronic discoid and systemic lupus erythematosus (SLE) and acute or chronic rheumatoid arthritis in patients not responding to other therapies.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Lichen planus–like eruptions.

CVS: Hypotension; ECG changes; cardiomyopathy (rare).

CNS: Headache; irritability; nervousness; emotional changes; nightmares; psychosis; dizziness; vertigo; nystagmus; nerve deafness; convulsions; ataxia.

GI: Anorexia; nausea; vomiting; diarrhea; abdominal cramps.

MISC: Immunoblastic lymphadenopathy; extraocular muscle palsies, photophobia; skeletal muscle weakness; absent or hypoactive deep tendon reflexes; agranulocytosis, blood dyscrasias.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *For patients taking this drug on a long term basis:* Monitor vital signs. Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- If GI side effects occur, consider semisupine chair position.
- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.

hydroxyzine (high-DROX-ih-zeen)

Hydroxyzine Hydrochloride, Vistaril

Apo-Hydroxyzine, Novo-Hydroxyzin, Nu-Hydroxyzine, PMS-Hydroxyzine

Drug Class: Antianxiety; Antihistamine; Antiemetic (parenteral)

PHARMACOLOGY

Action

May be caused by suppression of activity in subcortical areas of CNS.

Uses

Symptomatic relief of anxiety and tension associated with psychoneurosis; adjunct therapy in organic disease states with anxiety; management of pruritus caused by allergic conditions; sedative before and after general anesthesia (PO, IM).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Transitory drowsiness; involuntary motor activity, including tremor and convulsions.

RESP: Hypersensitivity reactions (e.g., wheezing, shortness of breath).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *When CNS depressants are used by DDS:* Reduce dose by half.
- *When prescribed by DDS:* Inform patient not to drive, sign important papers, or operate mechanical equipment while taking drug. Short-term use is not likely to cause effects of chronic xerostomia.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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hyoscyamine sulfate (hye-oh-SYE-a-mean)

Anaspaz, Cystospaz, Donnamar, Donnatal, ED-SPAZ, Gastrosed, Levbid, Levsin, Levsin Drops, Levsin/SL, Levsinex Timecaps, NuLev

Drug Class: Belladonna alkaloid; Anticholinergic

PHARMACOLOGY

Action
Inhibits the action of acetylcholine on structures innervated by postganglionic cholinergic nerves and on smooth muscles. These receptors are located in the autonomic effector cells of the smooth muscle, cardiac muscle, sinoatrial node, atrioventricular node, and exocrine glands. Inhibits GI propulsive motility and decreases gastric acid secretion. Controls excessive pharyngeal, tracheal, and bronchial secretions.

Uses
To control gastric secretion, visceral spasm, hypermotility in spastic colitis, spastic bladder, cystitis, pylorospasm, and associated abdominal cramps; to reduce symptoms of functional intestinal disorders such as those seen with mild dysentery, diverticulitis, and acute enterocolitis; treatment of infant colic; as a "drying" agent in rhinitis; to reduce rigidity and tremors and to control sialorrhea and hyperhidrosis of Parkinson disease; with morphine or other narcotics, for symptomatic relief of biliary and renal colic; poisoning by anticholinesterase agents; adjunct therapy in treatment of peptic ulcer, irritable bowel syndrome, functional GI disorders, neurogenic bladder, and neurogenic bowel disturbances; preoperative to reduce secretions; block cardiac vagal inhibitory reflexes during anesthesia induction and intubation.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth; taste disturbance; dysphagia.

CNS: Headache; nervousness; drowsiness; weakness; dizziness; confusion, insomnia; fever; excitability; restlessness; tremor; speech disturbance.

CVS: Palpitations; tachycardia.

GI: Nausea; vomiting; heartburn constipation, bloated feeling; paralytic ileus.

MISC: Suppressed lactation; decreased sweating, photophobia.

CLINICAL IMPLICATIONS

General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Anticholinergics have strong xerostomic effects. Anticipate increased caries activity and candidiasis.
- Substernal pain (heartburn) may mimic pain of cardiac origin.
- Use COX inhibitors with caution, they may exacerbate PUD and GERD.
- Monitor vital signs.
- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.

Oral Health Education
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

ibandronate sodium (i-BAN-droh-nate SO-dee-um)

Boniva

Drug Class: Bisphosphonate

PHARMACOLOGY

Action

Inhibits osteoclast activity and reduces bone resorption and turnover.

Uses

Treatment (injection, tablets) and prevention (tablets) of osteoporosis in postmenopausal women.

Unlabeled Uses

Treatment of metastatic bone disease in breast cancer.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

NSAIDs: increased risk of gastric ulcers (additive)

- Avoid concurrent use.

ADVERSE EFFECTS

The overall safety and tolerability profiles of the oral and IV dosage forms are similar.

⚠ **ORAL:** Osteonecrosis of the jaw (rare); tooth disorder (unspecified, 4%).

CVS: Hypertension (7%).

CNS: Headache (7%); asthenia, dizziness (4%); fatigue, insomnia, vertigo (3%); depression, nerve root lesion (2%).

GI: Dyspepsia (12%); abdominal pain (8%); diarrhea (7%); nausea (5%); constipation; gastroenteritis, vomiting (3%); gastritis (2%); dysphagia, esophageal and gastric ulcer, esophagitis (postmarketing).

RESP: Upper respiratory infection (34%); bronchitis (10%); pneumonia (6%).

MISC: Acute phase reaction (oral 4%; injection 10%); influenza, pain in extremities (8%); flu-like symptoms (5%); infection (4%); allergic reactions (3%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Patients may be high-risk candidates for pathological fractures or jaw fractures during extractions.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function.
- If GI side effects occur, consider semisupine chair position.
- Osteonecrosis of the jaw is reported; consider this adverse drug effect when osteolytic disease is suspected or when surgical procedures are indicated.

Oral Health Education

- Encourage patient to follow daily plaque control procedures for effective self-care.
- Prevention of oral disease is theorized to prevent osteonecrosis of jaw. Regular oral examination for oral disease is essential.
- Inform patient of the small risk for osteonecrosis of the jaw.

ibuprofen (eye-BYOO-pro-fen)

Advil, Advil Liqui-Gels, Children's Advil, Children's Motrin, Junior Strength Advil, Junior Strength Motrin, Menadol, Midol, Motrin IB, PediaCare Fever, Pediatric Advil Drops: Tablets: 100, 200, 400, 600, 800 mg; Caplets: 200 mg; Chewa-

ble tablets: 50, 100 mg; Suspension: 100 mg/2.5 mL, 100 mg/5 mL; Oral drops: 40 mg/mL

Advil Migraine, Infant's Motrin, Midol Maximum Strength Cramp Formula, Motrin, Motrin Migraine Pain

Apo-Ibuprofen, Motrin IB Extra Strength, Motrin IB Super Strength, Novo-Profen, Nu-Ibuprofen

Drug Class: Analgesic; NSAID

PHARMACOLOGY

Action

Decreases inflammation, pain, and fever, probably through inhibition of COX activity and prostaglandin synthesis.

Uses

Relief of symptoms of rheumatoid arthritis, osteoarthritis, mild to moderate pain, primary dysmenorrhea, reduction of fever.

Unlabeled Uses

Symptomatic treatment of juvenile rheumatoid arthritis, sunburn, resistant acne vulgaris.

Contraindications

Hypersensitivity to aspirin, iodides, or any other NSAID.

Usual Dosage

Mild to moderate pain

ADULTS: *PO:* 400 mg q 4 to 6 hr

OTC use (minor aches/pains, dysmenorrhea, fever reduction)

PO: 200 mg q 4 to 6 hr. Do not exceed 1.2 g in 24 hr or take for pain for more than 10 days or for fever for more than 3 days, unless directed by health care provider. Use smallest effective dose.

Pharmacokinetics

ABSORP: T_{max} is 1 to 2 hr. Bioavailability is less than 80%.

DIST: Vd is 0.15 L/kg. 99% protein bound.

EXCRET: Plasma $t_{1/2}$ is 1.8 to 2 hr. 45% to 79% is eliminated through the urine. Cl is 3 to 35 L/hr.

DRUG INTERACTIONS

Angiotensin-converting enzyme inhibitors: Decreased antihypertensive effect (decreased prostaglandin
- Monitor blood pressure.

Anticoagulants, oral: Increased bleeding (platelet inhibition)
- Avoid concurrent use.

Aspirin: Inhibition of antiplatelet effect of aspirin (blocks access of aspirin to active site)
- Avoid concurrent use.

Beta-adrenergic blockers: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

Corticosteroids: Increased risk of peptic ulcer disease (additive)
- Avoid concurrent use.

Furosemide: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor vital signs.

Lithium: Lithium toxicity (decreased renal excretion)
- Avoid concurrent use.

Methotrexate: Possible methotrexate toxicity (decreased renal excretion)
- Avoid concurrent use.

Naltrexone: Possible increased risk of hepatotoxicity (mechanism unknown)
- Avoid concurrent use.

Thiazide diuretics: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

Valproate: Possible increased valproate toxicity (displacement from binding site)
- Monitor clinical status.

ADVERSE EFFECTS

CVS: Peripheral edema; water retention; worsening or precipitation of CHF.

CNS: Dizziness; lightheadedness; drowsiness; vertigo; headaches; aseptic meningitis.

GI: Gastric distress; occult blood loss; diarrhea; vomiting; nausea; heartburn; dyspepsia; anorexia; constipation; abdominal distress/cramps/pain; flatulence; indigestion; GI tract fullness.

MISC: Muscle cramps.

CLINICAL IMPLICATIONS

General

When recommended by DDS:
- *Lactation:* Undetermined.
- *Children:* Safety and efficacy not established.
- *Elderly:* Increased risk of adverse reactions.
- *Renal failure:* Increased risk of dysfunction in patients with preexisting renal disease.
- *GI effects:* Serious GI toxicity (e.g., bleeding, ulceration, perforation) can occur at any time, with or without warning symptoms.
- *Overdosage:* Drowsiness, lethargy, GI irritation/bleeding, nausea, vomiting, tinnitus, sweating, acute renal failure, epigastric pain, metabolic acidosis.

When prescribed by medical facility:
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If GI side effects occur, consider semisupine chair position.

Pregnancy Risk Category: Undetermined.

Oral Health Education

When recommended by DDS:
- Tell patient to take medication soon after meals or with food, milk, or antacids.
- Advise patient to discontinue drug and notify health care provider if any of the following occur: persistent GI upset or headache, skin rash, itching, visual disturbances, black stools, weight gain or edema, changes in urine pattern, joint pain, fever, blood in urine.
- Instruct patient not to take OTC preparation for more than 3 days for fever and more than 10 days for pain and to notify health care provider if condition does not improve.

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ibuprofen/hydrocodone bitartrate (eye-BYOO-profen/HIGH-droe-KOE-dohn by-TAR-trate)

Synonym: hydrocodone bitartrate/ibuprofen

Reprexain: Tablets: 5 mg hydrocodone bitartrate and 200 mg ibuprofen, 7.5 mg hydrocodone bitartrate and 200 mg ibuprofen
Vicoprofen: Tablets: 7.5 mg hydrocodone bitartrate and 200 mg ibuprofen

Drug Class: Analgesic, Antitussive, NSAID

DEA Schedule: Schedule III

PHARMACOLOGY

Action

Hydrocodone: Suppresses cough reflex; stimulates opiate receptors in the CNS and peripherally blocks pain impulse generation.

IBUPROFEN: Decreases inflammation, pain, and fever, probably through inhibition of COX activity and prostaglandin synthesis.

Uses
Short-term (generally less than 10 days) management of acute pain. Not indicated for treatment of osteoarthritis or rheumatoid arthritis.

Contraindications
Hypersensitivity to hydrocodone, other opioids, ibuprofen, or other NSAIDs; patients who have experienced asthma, urticaria, or allergic-type reactions after taking aspirin or other NSAIDs.

Usual Dosage
ADULTS AND CHILDREN (16 YR AND OLDER): *PO:* 1 tablet q 4 to 6 hr (max, 5 tablets/24-hr period).

Pharmacokinetics
Ibuprofen
ABSORP: T_{max} is 1 to 2 hr. Bioavailability is less than 80%.
DIST: Vd is 0.15 L/kg. 99% protein bound.
EXCRET: Plasma $t_{1/2}$ is 1.8 to 2 hr. 45% to 79% is eliminated through the urine. Cl is 3 to 35 L/hr.
Hydrocodone
ABSORP: Hydrocodone is rapidly absorbed from the GI tract. T_{max} is acheived at 1.7 hr.
DIST: Distributed throughout the body. Not extensively protein bound.
METAB: Extensively metabolized in the liver to hydromorphone by *O*-demethylation by the CYP2D6 isoenzyme.
EXCRET: Hydrocodone and its metabolites are eliminated primarily in the kidneys.
ONSET: 30 min.
PEAK: 1.7 hr.
DURATION: 4.5 hr.
SPECIAL POP: *Severe renal insufficiency:* The effect of renal insufficiency on the pharmacokinetics of hydrocodone has not been determined.

DRUG INTERACTIONS
See also: ibuprofen — Drug Interactions
No specific documented drug-drug interactions with hydrocodone. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth (3% to 9%); mouth ulcer, thirst (<3%).
CVS: Palpitations, vasodilation (<3%); arrhythmia, hypotension, tachycardia (<1%).
CNS: Headache (27%); somnolence (22%); dizziness (14%); anxiety, insomnia, nervousness, paresthesia (3% to 9%); confusion, hypertonia, thinking abnormalities (<3%).
GI: Constipation (22%); nausea (21%); dyspepsia (12%); diarrhea, flatulence, vomiting (3% to 9%); anorexia, gastritis, melena (<3%).
RESP: Dyspnea, hiccups (<3%); pulmonary congestion, pneumonia (<1%).
MISC: Abdominal pain, asthenia, infection (3% to 9%); fever, flu-like symptoms, pain (<3%); allergic reaction (<1%).

CLINICAL IMPLICATIONS
General
When prescribed by DDS:
- Short-term use only; there is no justification for long-term use in the management of dental pain.
- *Lactation:* Undetermined.
- *Children:* Safety and efficacy in children younger than 16 yr not established.

- *Elderly:* Use with caution because of possible increased sensitivity to renal and GI effects of ibuprofen, as well as increased respiratory depression with hydrocodone.
- *Renal failure:* Use with caution and monitor kidney function in patients with advanced kidney disease.
- *Hepatic failure:* As with other NSAIDs, ibuprofen has been reported to cause borderline elevations of one or more liver enzymes; this may occur in up to 15% of patients.
- *Special risk:* Use with caution in elderly or debilitated patients and in those with hepatic or renal dysfunction, hypothyroidism, Addison disease, prostatic hypertrophy, or urethral stricture.
- *Aseptic meningitis:* Aseptic meningitis with fever and coma has been observed on rare occasions in patients on ibuprofen therapy. If signs or symptoms of meningitis develop in a patient on Vicoprofen, the possibility of its being related to ibuprofen should be considered.
- *Cough reflex:* Hydrocodone suppresses the cough reflex; as with opioids, caution should be exercised when Vicoprofen is used postoperatively and in patients with pulmonary disease.
- *Dependence:* Hydrocodone has abuse potential; may be habit forming and cause physical dependence.
- *Fluid retention and edema:* May occur, therefore, use with caution in patients with a history of cardiac decompensation, hypertension, or heart failure.
- *GI effects:* Serious GI toxicity (e.g., bleeding, ulceration, perforation) can occur at any time, with or without warning symptoms.
- *Hematological effects:* Ibuprofen, like other NSAIDs, can inhibit platelet aggregation but the effect is quantitatively less and of shorter duration than that seen with aspirin. Because this prolonged bleeding effect may be exaggerated in patients with underlying hemostatic defects, Vicoprofen should be used with caution in persons with intrinsic coagulation defects and those on anticoagulant therapy.
- *Preexisting asthma:* Patients with asthma may have aspirin-sensitive asthma. The use of aspirin in patients with aspirin-sensitive asthma has been associated with severe bronchospasm, which may be fatal. Because cross-reactivity between aspirin and other NSAIDs has been reported in such aspirin-sensitive patients, Vicoprofen should not be administered to patients with this form of aspirin sensitivity and should be used with caution in patients with preexisting asthma.
- *Overdosage:* HYDROCODONE: Respiratory depression, extreme somnolence progressing to stupor or coma, skeletal muscle flaccidity, cold and clammy skin, bradycardia, hypotension, apnea, circulatory collapse, cardiac arrest, death. IBUPROFEN: GI irritation with erosion; hemorrhage or perforation; kidney, liver, and heart damage; hemolytic anemia; meningitis; headache; dizziness; tinnitus; confusion; blurred vision; mental disturbances; skin rash; stomatitis; edema; reduced retinal sensitivity; corneal deposits; hyperkalemia.

When prescribed by medical facility:

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Pregnancy Risk Category: Category C.

Oral Health Education

When prescribed by DDS:

- Explain name, dose, action, and potential side effects of drug.
- Advise patient to take 1 tablet q 4 to 6 hr if needed for pain but to not take more than 5 tablets in 24 hr.
- Advise patient to take without regard to meals but to take with food if GI upset occurs.
- Advise patient that medication is intended to be used for a short period of time (i.e., <10 days) for management of acute pain and is not for long-term use. If pain persists or is not controlled, advise patient to discuss other options for pain management with health care provider.
- Instruct patient to avoid alcoholic beverages and other depressants while taking this medication.

- Advise patient that drug may impair judgment, thinking, or motor skills or cause drowsiness, and to use caution while driving or performing other tasks requiring mental alertness until tolerance is determined.
- Advise patient to stop taking the drug and notify health care provider if any of the following occur: allergic reaction, unusual bleeding or bruising, shortness of breath, black or tarry stools, vomiting of blood or coffee-ground material, blurred vision, edema, excessive sedation.
- Advise women to notify health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Warn patient not to take any prescription or OTC drugs or dietary supplements without consulting health care provider.
- Advise patient that follow-up visits may be necessary to monitor therapy and to keep appointments.

When prescribed by medical facility:

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

ibuprofen/oxycodone (eye-BYOO-pro-fen/OX-ee-KOE-dohn)

Synonym: oxycodone/ibuprofen

Combunox: Tablet: 5 mg oxycodone HCl, 400 mg ibuprofen

Drug Class: Opioid/nonopioid analgesic combination

DEA Schedule: Schedule II

PHARMACOLOGY

Action

Oxycodone HCl is a centrally acting semisynthetic opioid analgesic with multiple actions, which involve binding to opiate receptors in the CNS and affects on smooth muscle. Ibuprofen is an NSAID with analgesic and antipyretic properties; action thought to be related to its inhibition of COX activity and prostaglandin synthesis.

Uses

Short-term (no more than 7 days) management of acute, moderate to severe pain.

Contraindications

Hypersensitivity to oxycodone or opioids, ibuprofen; respiratory depression; acute or severe bronchial asthma; hypercarbia; paralytic ileus; allergic-type reactions after taking aspirin or other NSAIDs; head injury; PUD; pregnancy category C (3rd trimester X). Warnings include patient with history of drug abuse or addiction; patients with hypotension or predisposed to circulatory shock; oxycodone affects center that controls respiratory rhythm, may produce irregular and periodic breathing; COPD or cor pulmonale; decreased respiratory reserve, hypoxia, hypercapnia, or preexisting respiratory depression. In these patients, therapeutic doses may decrease respiratory drive to the point of apnea. NSAIDs can promote GI bleeding, ulceration, and perforation of the stomach; be alert for GI symptoms in at-risk patients, as even short-term therapy is not without risk; Combunox not recommended in advanced kidney disease. Precautions include elderly or debilitated patient; severe impairment of hepatic, pulmonary, or renal function; hypothyroidism, Addison disease, acute alcoholism, convulsive disorders, CNS depression or coma, delirium tremens, kyphoscoliosis associated with respiratory depression; toxic psychosis, prostatic hypertrophy or urethral stricture; biliary tract disease; acute pancreatitis; increased liver enzymes; dehydration; kidney disease; intrinsic coagulation defects; anticoagulant therapy; cardiac decompensation, hypertension, or heart failure; asthma; lactation.

Usual Dosage

Acute moderate to severe pain

ADULTS (AGE 14 AND OLDER): One tablet daily; not to exceed 4 tablets in a 24-hr period and not to exceed 7 days.
CHILDREN: Not studied in patients younger than age 14 yr.

Pharmacokinetics

ABSORP: Rapid absorption of oxycodone after single oral dose within 2 hr; repeated administration q6h does not result in accumulation of ibuprofen; bioavailability of ibuprofen not affected by food.
DIST: Protein binding of oxycodone is ~45%; ibuprofen extensively bound at 99%.
METAB: Liver metabolism of oxycodone to oxymorphone via CYP2D6 isoenzyme; ibuprofen undergoes interconversion in plasma from R-isomer to S-isomer, metabolized to phenyl propionic acids, which circulate in plasma at low levels.
EXCRET: Oxycodone eliminated with $t_{1/2}$ ranging from 1.8 to 2.6 hr after single dose; urinary excretion of unchanged ibuprofen minimal.
ONSET: 2 to 3 hr.
PEAK: 3 hr.
DURATION: 6 hr; no multiple dose efficacy studies have been performed.
SPECIAL POP: *Renal failure:* Precaution in kidney disease.
Elderly: Precaution in elderly.
Hepatic failure: Precaution in liver disease.
Gender: No gender effects on pharmacokinetics.

DRUG INTERACTIONS

See also: ibuprofen — Drug Interactions
Oxycodone is additive with other CNS depressants.
Cimetidine: Oxycodone toxicity (decreased metabolism)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (<1%).
CNS: Somnolence (7.3%); dizziness (5.1%).
GI: Nausea (8.8%); vomiting (5.3%); flatulence (1%).
MISC: Sweating (1.6%).

CLINICAL IMPLICATIONS

General

- If oral pain requires additional analgesics, consider nonopioid products.
- *Geriatric patients:* Use lower dose of opioid.
- Dry mouth is unlikely in short-term use. No justification for long-term use in the management of dental pain.

Pregnancy Risk Category: Category C (last trimester Category X).

Oral Health Education

- *When prescribed by DDS:* Warn patient not to drive, sign important papers, or operate mechanical equipment.

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imipramine HCl (im-IPP-ruh-meen HIGH-droe-KLOR-ide)

(imipramine pamoate)

Tofranil, Tofranil-PM

Apo-Imipramine, Impril

Talpramin

Drug Class: Tricyclic antidepressant

PHARMACOLOGY

Action

Inhibits reuptake of norepinephrine and, to a lesser degree, serotonin in CNS.

Uses

Relief of symptoms of depression; treatment of enuresis in children age 6 yr and older.

Unlabeled Uses

Treatment of chronic pain, panic disorder, eating disorders (bulimia nervosa), and facilitation of cocaine withdrawal.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Tramadol: Increased risk of seizures (additive)
- Avoid concurrent use.

Sympathomimetic amines: Hypertension or hypertensive crisis (additive)
- Monitor vital signs.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disturbance; gingivitis; stomatitis; black tongue; aphthous stomatitis.
CNS: Confusion; hallucinations; delusions; nervousness; restlessness; agitation; panic; insomnia; nightmares; mania; exacerbation of psychosis; drowsiness; dizziness; weakness; numbness; extrapyramidal symptoms; emotional lability; seizures; tremors.
CVS: Arrhythmias; flushing; hypertension or hypotension; palpitations; orthostatic hypotension; tachycardia
GI: Nausea; vomiting; anorexia; GI distress; diarrhea; flatulence; constipation.
RESP: Pharyngitis; rhinitis; sinusitis; laryngitis; coughing.
MISC: Bone marrow depression (e.g., agranulocytosis, leukopenia, aplastic anemia, thrombocytopenia).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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indapamide (IN-DAP-uh-mide)

Lozol

Apo-Indapamide, Gen-Indapamide, Lozide, Novo-Indapamide, Nu-Indapamide, PMS-Indapamide

Drug Class: Thiazide diuretic

PHARMACOLOGY

Action

Enhances excretion of sodium, chloride, and water by interfering with transport of sodium ions across renal tubular epithelium.

Uses

Treatment of edema associated with CHF, cirrhosis, renal dysfunction, and corticosteroid or estrogen therapy; management of hypertension.

Unlabeled Uses

Treatment of calcium nephrolithiasis, osteoporosis, or diabetes insipidus.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor vital signs.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (<5%).
CNS: Dizziness; lightheadedness; vertigo; headache; weakness; restlessness; insomnia; drowsiness; fatigue; lethargy; anxiety; depression; nervousness.
CVS: Orthostatic hypotension, palpitations (<5%).
GI: Anorexia; gastric irritation; epigastric distress; nausea; vomiting; abdominal pain/cramping/bloating; diarrhea; constipation.
RESP: Rhinorrhea.
MISC: Muscle cramp or spasm; acute gout.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Monitor pulse rhythm to assess for electrolyte imbalance.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

indinavir sulfate (in-DIN-ah-veer SULL-fate)

Crixivan

Drug Class: Antiretroviral, protease inhibitor

PHARMACOLOGY

Action

Inhibits HIV protease, the enzyme that cleaves viral polyprotein precursors into functional proteins in HIV-infected cells. Inhibition of this enzyme by indinavir results in formation of immature noninfectious viral particles.

Uses
Treatment of HIV infection in adults when antiretroviral therapy is warranted.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth; altered taste.
CNS: Headache; insomnia; dizziness; somnolence; anxiety.
GI: Nausea; vomiting; diarrhea; anorexia; acid reflux; abdominal pain.
RESP: Cough.
MISC: Asthenia; fatigue; flank pain; back pain; chest pain; malaise; fever; flu-like symptoms.

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values improve.
- Anticipate oral candidiasis when HIV disease is reported.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care since HIV infection reduces host resistance.

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indomethacin (in-doe-METH-uh-sin)
(indomethacin sodium trihydrate)

Indocin, Indocin IV, Indocin SR

Apo-Indomethacin, Indocid, Indocid P.D.A., Novo-Methacin, Nu-Indo, ratio-Indomethacin, Rhodacine

Antalgin, Indocid, Malival

Drug Class: Analgesic; NSAID

PHARMACOLOGY
Action
Decreases inflammation, pain, and fever, probably through inhibition of COX activity and prostaglandin synthesis.

Uses
INDOMETHACIN: Symptomatic treatment of rheumatoid arthritis, osteoarthritis, ankylosing spondylitis, gouty arthritis, acute painful shoulder.
INDOMETHACIN SODIUM TRIHYDRATE (IV): Closure of patent ductus arteriosus.

Unlabeled Uses
Treatment of primary dysmenorrhea; migraine prophylaxis; treatment of cluster headache, polyhydramnios, sunburn; cystoid macular edema.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Dizziness; headache; drowsiness; confusion.
CVS: Edema.
MISC: Ecchymoses, agranulocytosis, leukopenia, hemolytic anemia, aplastic anemia (<1%); fluid retention; hyperkalemia.
GI: Gastric distress; occult blood loss; nausea; diarrhea; vomiting; ulceration; perforation.
RESP: Pulmonary edema; dyspnea.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Use COX inhibitors with caution, as they may exacerbate PUD and GERD.
- *Arthritis:* Consider patient comfort and need for semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- If GI or respiratory side effects occur, consider semisupine chair position.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.

I

infliximab (in-FLICK-sih-mab)

Remicade

Drug Class: Monoclonal antibody

PHARMACOLOGY

Action

Neutralizes the biological activity of TNF-alpha by binding to its soluble and transmembrane forms and inhibits TNF-alpha receptor binding.

Uses

Reduce signs and symptoms and induce and maintain clinical remission of moderate to severe Crohn disease; reduce number of draining enterocutaneous and rectovaginal fistulas and maintain fistula closure in Crohn disease; in combination with methotrexate to reduce signs and symptoms, inhibit progression of structural damage, and improve physical function in patients with moderately to severely active rheumatoid arthritis who have had inadequate response to methotrexate.

Unlabeled Uses

Treatment of plaque psoriasis, ankylosing spondylitis, ulcerative colitis, psoriatic arthritis, psoriasis, Behçet syndrome, uveitis, and juvenile arthritis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Headache (29%); depression (8%); insomnia (6%); dizziness; confusion; suicide attempt; meningitis; neuritis; peripheral neuropathy.
GI: Nausea (24%); diarrhea (19%); abdominal pain (17%); dyspepsia (10%); vomiting; intestinal obstruction, perforation, and stenosis; pancreatitis; proctalgia; constipation; GI hemorrhage; ileus; peritonitis.
RESP: URI (40%); sinusitis (20%); coughing (18%); pharyngitis (17%); rhinitis (14%); dyspnea (6%); adult respiratory distress syndrome; bronchitis; pleurisy; respiratory insufficiency.

MISC: Infusion reactions (20%); fatigue, fever, back pain, arthralgia (13%); moniliasis (8%); abscess (6%); lupus-like syndrome; pain; infections; myalgia; tendon disorder; cellulitis; sepsis; cholecystitis; chills; allergic reaction; diaphragmatic hernia; edema; surgical/procedural sequela; intervertebral disc herniation; neoplasms (e.g., blood cell, breast); serum sickness.

POSTMARKETING: Infections have been observed with various pathogens including viral, bacterial, fungal, and protozoal organisms and have been noted in all organ systems in patients receiving infliximab alone or in combination with immunosuppressive agents. Other adverse reactions reported during postmarketing experience include demyelinating disorders (e.g., multiple sclerosis), Guillain-Barré syndrome, interstitial pneumonitis, fibrosis, neuropathies, hemolytic anemia, idiopathic thrombocytic purpura, thrombotic thrombocytopenic purpura, and transverse myelitis. Anaphylactic-like reactions, including laryngeal/pharyngitis edema, severe bronchospasm, and seizure have been associated with infliximab administration.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Most adverse drug reactions were due to infusion reactions. Appoint for dental procedures several days after infusion to avoid adverse effects.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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insulin (IN-suh-lin)

(insulin zinc suspension 70% NPH, human insulin isophane suspension and 30% regular, human insulin injection ([rDNA] origin) NPH, isophane insulin suspension regular, insulin injection)

Humulin 50/50, Humulin 70/30, Humulin N, Humulin R, Lente Iletin II, Novolin 70/30, Novolin N, Novolin R

Novolin ge 30/70, Novolin ge 40/60, Novolin ge 50/50, Novolin ge Lente, Novolin ge NPH, Novolin ge Toronto, Novolin ge Ultralente

Drug Class: Antidiabetic, hormone replacement

PHARMACOLOGY

Action

Insulin and its analogs lower blood glucose levels by stimulating peripheral glucose uptake, especially by skeletal muscle and fat, and by inhibiting hepatic glucose production. Insulin inhibits lipolysis, proteolysis, and enhances protein synthesis. Insulin is composed of two amino acid chains (i.e., A [acidic] and B [basic]) joined together by disulfide linkage. Human insulin has minor but important differences from animal insulin with respect to amino acid sequence on the B-chain. It is derived from a biosynthetic process with strains of *Escherichia coli* (recombinant DNA [rDNA]) or yeast. In some patients, human insulin may have a more rapid onset and shorter duration of action than pork insulin. However, the bioavailability of the insulins is identical when given SC. Human insulin is slightly less antigenic than pork or beef insulins. Human insulin is also the insulin of choice for patients with insulin allergy, insulin resistance, all pregnant patients with diabetes, and any patient who uses insulin intermittently.

Uses

Management of type 1 diabetes mellitus (insulin-dependent) and type 2 diabetes mellitus (non-insulin-dependent) not properly controlled by diet, exercise, and weight reduction. In

hyperkalemia, infusions of glucose and insulin lower serum potassium levels. IV or IM regular insulin may be given for rapid effect in severe ketoacidosis or diabetic coma. Highly purified (single component) and human insulins are used for treatment of local insulin allergy, immunologic insulin resistance, lipodystrophy at injection site, temporary insulin administration, and in newly diagnosed diabetic patients.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Aspirin: Possible increased hypoglycemic effect with large doses (mechanism unknown)
- Monitor clinical status.

ADVERSE EFFECTS

CVS: Arrhythmia (associated with hypokalemia).
MISC: Hypersensitivity reaction (e.g., rash, shortness of breath, fast pulse, sweating, hypotension, anaphylaxis, angioedema); local reactions (e.g., redness, swelling, itching at injection site); hypoglycemia; hypokalemia.

CLINICAL IMPLICATIONS

General

- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated.
- Monitor blood pressure because hypertension and dyslipidemia (CAD) are prevalent in diabetes mellitus.
- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical dental procedures.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Observe for signs of hypoglycemia (e.g., confusion, argumentativeness, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- Ensure patient has taken medication and eaten meal.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin or Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- Determine ability to adapt to stress of dental treatment. Consider short morning appointments.
- Medical consult advised if fasting blood glucose is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- Consider time of peak hypoglycemic effect of insulin preparation.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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insulin analogs (IN-suh-lin)

Synonyms: insulin aspart; insulin detemir; insulin glargine; insulin glulisine; insulin lispro

NovoLog, NovoLog Mix 70/30, Levemir, Lantus, Apidra, Humalog, Humalog Mix 75/25, Humalog Mix 50/50

Drug Class: Antidiabetic agent

PHARMACOLOGY

Action

Receptor-bound insulin lowers blood glucose by facilitating cellular uptake of glucose into skeletal muscle and fat, and inhibiting the output of glucose from the liver. Receptor-bound insulin also inhibits lipolysis in adipocytes, inhibits proteolysis, and enhances protein synthesis.

Uses

INSULIN ASPART, INSULIN LISPRO: Treatment of patients with diabetes mellitus for the control of hyperglycemia.

INSULIN DETEMIR, INSULIN GLARGINE: Treatment of adults and children with type 1 or adults with type 2 diabetes mellitus who require long-acting insulin for control of hyperglycemia.

INSULIN GLULISINE: Treatment of adults with diabetes mellitus for the control of hyperglycemia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

MISC: Hypoglycemia, hypersensitivity reaction (e.g., anaphylaxis, angioedema, elevated alkaline phosphate, fast pulse, hypotension, rash, shortness of breath, sweating); local reactions (e.g., itching at injection site, redness, swelling).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin and Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated; however, doxycycline therapy in patients with poorly controlled diabetes has been shown to improve disease control and improve response following periodontal debridement.
- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Observe for signs of hypoglycemia (e.g., confusion, argumentativeness, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- Ensure patient has taken medication and eaten meal.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- Medical consult advised if fasting blood glucose is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- If insulin is used, consider time of peak hypoglycemic effect.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.

- Encourage daily plaque control procedures for effective self-care in patients with cardiovascular disease.

ipratropium bromide (IH-pruh-TROE-pee-uhm BROE-mide)

Atrovent

Apo-Ipravent, Combivent Inhalation Solution, Gen-Ipratropium, Novo-Ipramide, Nu-Ipratropium, PMS-Ipratropium, ratio-Ipratropium, ratio-Ipratropium UDV

Drug Class: Respiratory inhalant; Anticholinergic

PHARMACOLOGY

Action

Antagonizes action of acetylcholine on bronchial smooth muscle in lungs, causing bronchodilation.

Uses

BRONCHOSPASM: Maintenance treatment of bronchospasm associated with COPD, including chronic bronchitis and emphysema, used alone or in combination with other bronchodilators (especially beta-adrenergics).

RHINORRHEA: Symptomatic relief of rhinorrhea associated with allergic and nonallergic rhinitis and symptomatic relief of rhinorrhea associated with the common cold in patients age 12 yr and older for aerosol and solution, 6 yr and older for 0.03% nasal spray, and 5 yr and older for 0.06% nasal spray.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

ORAL: Dry mouth.
RESP: Cough; exacerbation of symptoms.
CNS: Nervousness; dizziness; headache.
GI: Nausea; GI distress; constipation.
MISC: Arthritis.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse rate) and respiratory function. Uncontrolled disease characterized by wheezing, coughing.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Ensure that bronchodilator inhaler is present at each dental appointment.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Inhalants can dry oral mucosa; anticipate candidiasis, increased calculus, plaque levels, and caries.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Rinse mouth with water after bronchodilator use to prevent dryness.

ipratropium bromide/albuterol sulfate (IH-pruh-TROE-pee-umm BROE-mide al-BYOO-ter-ahl SULL-fate)

Synonym: albuterol sulfate/ipratropium bromide

Combivent, DuoNeb

Drug Class: Bronchodilator

PHARMACOLOGY

Action

ALBUTEROL: Produces bronchodilation by relaxing bronchial smooth muscle through beta$_2$-receptor stimulation.

IPRATROPIUM: Antagonizes action of acetylcholine on bronchial smooth muscle in lungs, causing bronchodilation.

Uses

Treatment of bronchospasm associated with COPD in patients requiring more than one bronchodilator.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, taste disturbance (<2%).

CNS: Headache (6%); fatigue, dizziness, nervousness, tremor, paresthesia, insomnia (<2%); drowsiness; stimulation; coordination difficulty; weakness.

CVS: Tachycardia, palpitations (<3%).

GI: Nausea (2%); diarrhea, dyspepsia, vomiting (<2%); GI distress; constipation.

RESP: Bronchitis (12%); URI (11%); lung disease (6%); dyspnea (5%); coughing (4%); respiratory disorders (3%); sinusitis (2%); rhinitis, pneumonia (1%); paradoxical bronchospasm; wheezing; exacerbation of COPD symptoms.

MISC: Pain, chest pain (3%); influenza, leg cramps (1%); allergic-type reactions (e.g., skin rash, angioedema of tongue, lips, and face, laryngospasm, anaphylaxis), edema, increased sputum (<2%); heartburn; itching; flushing.

CLINICAL IMPLICATIONS

General

- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function. Uncontrolled disease characterized by wheezing, coughing.
- Ensure that bronchodilator inhaler is present at each dental appointment.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Inhalants can dry oral mucosa; anticipate candidiasis, increased calculus, plaque levels, and caries.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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irbesartan (ihr-beh-SAHR-tan)

Avapro

Aprovel

Drug Class: Antihypertensive; Angiotensin II antagonist

PHARMACOLOGY

Action

Antagonizes the effect of angiotensin II (vasoconstriction and aldosterone secretion) by blocking the angiotensin II (AT1 receptor) in vascular smooth muscle and the adrenal gland, producing decreased BP.

Uses
Treatment of hypertension; nephropathy in type 2 diabetes.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Fluconazole: Possible irbesartan toxicity (decreased metabolism)
- Monitor clinical status.

ADVERSE EFFECTS
CNS: Headache; anxiety/nervousness; dizziness.
CVS: Chest pain, tachycardia.
GI: Diarrhea; dyspepsia/heartburn; abdominal pain; nausea/vomiting.
RESP: Upper respiratory tract infection; influenza; pharyngitis; rhinitis; sinus abnormality.
MISC: Musculoskeletal pain/trauma; fatigue; UTI; rash.

CLINICAL IMPLICATIONS
General
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short, afternoon appointments.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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irbesartan/hydrochlorothiazide (IR-be-SAR-tan/HYE-droe-KLOR-oh-THYE-a-zide)
Avalide

Drug Class: Antihypertensive combination

PHARMACOLOGY
Uses
Treatment of hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
NSAIDs: Decreased diuretic and antihypertensive effects of hydrochlorothiazide (decreased prostaglandin synthesis leading to additive decrease in free water excretion)
- Monitor blood pressure.

Sympathomimetic amines: Hypokalemia with epinephrine (intracellular uptake of potassium)
- Monitor vital signs.
- Use local anesthetic agents with a vasoconstrictor with caution.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth.
CVS: Edema (3%); hypotension; chest pain (2%); tachycardia (1%).
CNS: Dizziness (8%); fatigue (7%); orthostatic dizziness (1%).

GI: Nausea, vomiting (3%); abdominal pain, dyspepsia/heartburn (2%).

MISC: Influenza (3%); angioedema involving swelling of face, lips, pharynx, and/or tongue (postmarketing).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine.*
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Use cardiac dose of vasoconstrictor (no more than 2 cartridges of 1:100,000 or 4 cartridges of 1:200,000). Use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several minutes at the end of the dental appointment before dismissing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients with cardiovascular disease.
- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.

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isoniazid (eye-so-NYE-uh-zid)

Synonyms: isonicotinic acid hydrazide; INH

Isoniazid, Nydrazid

Isotamine, PMS-Isoniazid

Drug Class: Anti-infective; Antitubercular

PHARMACOLOGY

Action

Interferes with lipid and nucleic acid biosynthesis in actively growing tubercle bacilli.

Uses

Treatment of all forms of tuberculosis.

Unlabeled Uses

Improvement of severe tremor in multiple sclerosis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Acetaminophen: Acetaminophen toxicity (increase in toxic metabolites)
- Avoid concurrent use.

Diazepam: Increased IV diazepam toxicity (decreased metabolism)
- Monitor clinical status.

Triazolam: Possible triazolam toxicity (decreased metabolism)
- Monitor clinical status.

ADVERSE EFFECTS

CNS: Peripheral neuropathy; convulsions; toxic encephalopathy; optic neuritis and atrophy; memory impairment; toxic psychosis.

GI: Nausea; vomiting; epigastric distress.

MISC: Gynecomastia; elevated liver enzymes, jaundice; rheumatic syndrome; systemic lupus erythematosus–like syndrome.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken (prevention or treatment). Consider implications of condition on dental treatment.
- Complete medical consult to ensure noninfectious state exists before providing dental treatment.
- *For dental emergencies:* Follow special precautions to minimize disease transmission (particulate respirators) or refer patient to a hospital-based dental facility.
- This drug causes elevated liver enzymes in 20% of cases and reduced liver function; this may affect drug selection during dental treatment.

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isosorbide dinitrate (EYE-sos-ORE-bide die-NYE-trate)

Dilatrate-SR, Isordil, Isordil Titradose

APO-ISDN

Isoket, Isorbid

Drug Class: Antianginal

PHARMACOLOGY

Action

Relaxation of smooth muscle of venous and arterial vasculature.

Uses

Treatment and prevention of angina pectoris.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Tooth disorder (unspecified).

CNS: Headache; apprehension; weakness; vertigo; dizziness; agitation; insomnia.

CVS: Hypotension, palpitations, arrhythmia, tachycardia, postural hypotension.

GI: Nausea; vomiting; diarrhea; dyspepsia.

RESP: Bronchitis; pneumonia.

MISC: Arthralgia; perspiration; pallor; cold sweat; edema.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment. Question regarding recent history of angina.
- Monitor vital signs (e.g., BP, pulse pressure, rate; and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

isosorbide dinitrate/hydralazine hydrochloride (EYE-sos-ORE-bide die-NYE-trate/high-DRAL-uh-zeen HIGH-droe-KLOR-ide)

BiDil

Drug Class: Vasodilator combination

PHARMACOLOGY

Action

Mechanism of beneficial effects in treatment of heart failure has not been identified.
Isosorbide dinitrate relaxes vascular smooth muscle in arteries and veins by releasing nitric oxide with subsequent activation of guanylyl cyclase.
Hydralazine selectively dilates arterial smooth muscle. Animal studies suggest it may also mitigate tolerance to nitrates.

Uses

Treatment of heart failure as an adjunct to standard therapy in self-identified black patients to improve survival; to prolong time to hospitalization for heart failure; to improve patient-reported functional status.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

NSAIDs: Decreased antihypertensive effect of hyralazine (decreased prostaglandin synthesis)

- Monitor blood pressure.

ADVERSE EFFECTS

The incidence stated for the following adverse reactions were reported with BiDil (isosorbide dinitrate/hydralazine hydrochloride) administration. Adverse reactions occurring with administration of isosorbide dinitrate or hydralazine hydrochloride are listed in their respective monographs.

CVS: Hypotension (8%); palpitations, ventricular tachycardia (4%); tachycardia (2%).

CNS: Headache (50%); dizziness (32%); asthenia (14%); paresthesia (4%); malaise, somnolence (less than 2%).

GI: Nausea (10%); vomiting (4%); cholecystitis (less than 2%).

RESP: Bronchitis (8%); sinusitis (4%).

MISC: Chest pain (16%); allergic reaction (less than 2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- If GI side effects occur, consider semisupine chair position.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Use cardiac dose of vasoconstrictor (no more than 2 cartridges of 1:100,000 or 4 cartridges of 1:200,000). Use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Evaluate respiratory rate and qualities.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients with cardiovascular disease.

isosorbide mononitrate (EYE-sos-ORE-bide MAH-no-NYE-trate)

Imdur, ISMO, Isotrate ER, Monoket

Elantan, Mono Mack

Drug Class: Antianginal

PHARMACOLOGY

Action

Relaxation of smooth muscle of venous and arterial vasculature.

Uses

Prevention of angina pectoris.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Tooth disorder (unspecified).

CNS: Headache; apprehension; weakness; vertigo; dizziness; agitation; insomnia.

CVS: Hypotension; palpitations; arrhythmia; tachycardia; postural hypotension.

GI: Nausea; vomiting; diarrhea; dyspepsia.

MISC: Arthralgia; perspiration; pallor; cold sweat; edema.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment. Question regarding recent history of angina.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

isotretinoin (EYE-so-TREH-tih-NO-in)

Synonym: 13-cis-retinoic acid

Accutane, Claravis

Accutane Roche, Isotrex

Roaccutan

Drug Class: Acne

PHARMACOLOGY

Action

Reduces sebum secretion and sebaceous gland size, inhibits sebaceous gland differentiation, and alters sebum lipid composition.

Uses
Treatment of severe recalcitrant cystic acne.

Unlabeled Uses
Treatment of keratinization disorders, cutaneous T-cell lymphoma, leukoplakia; prevention of skin cancer in patients with xeroderma pigmentosum.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Dry lips, mouth; herpes simplex; gingival bleeding, gingivitis.
CNS: Fatigue; headache; pseudotumor cerebri (e.g., benign intracranial hypertension with headache, visual disturbances, and papilledema); dizziness; drowsiness; insomnia; lethargy; malaise; nervousness; paresthesias; seizures; stroke; weakness; suicidal ideation; suicide attempts; suicide; psychosis; emotional instability; aggression; violent behaviors.
CVS: Palpitations; tachycardia; thrombotic disease; syncope.
GI: Nausea; vomiting; abdominal pain; nonspecific GI symptoms; anorexia; inflammatory bowel disease; esophagitis/esophageal ulceration.
RESP: Bronchospasms, with or without a history of asthma; respiratory infections; voice alterations.
MISC: Flushing; reversibly elevated triglycerides; increased cholesterol level; vasculitis (including Wegener granulomatosis); lymphadenopathy; edema; neutropenia, agranulocytosis; photosensitization.

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Dryness and chapping of lips:* Apply protective ointment to lips before oral procedures.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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isradipine (iss-RAHD-ih-peen)
DynaCirc, DynaCirc CR
Drug Class: Calcium channel blocker

PHARMACOLOGY
Action
Reduces systemic vascular resistance and BP by inhibiting movement of calcium ions across cell membrane in systemic and coronary vascular smooth muscle and myocardium.

Uses
Treatment of hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Gingival hyperplasia, dry mouth (uncommon).
CNS: Dizziness; lightheadedness; headache; fatigue; lethargy; weakness; shakiness; psychiatric disturbances.
CVS: Tachycardia; palpitations; chest pain.

GI: Nausea; diarrhea; constipation; abdominal discomfort; cramps; dyspepsia; vomiting.
RESP: Shortness of breath; dyspnea; wheezing.
MISC: Transient ischemic attack; stroke; leukopenia (<1%).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Anticipate gingival hyperplasia; consider MD consult to recommend different drug regimen if periodontal health is compromised.
- Blood dyscrasias rarely reported; anticipate increased infection and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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itraconazole (ih-truh-KAHN-uh-zole)

Sporanox

Drug Class: Anti-infective; Antifungal

PHARMACOLOGY

Action

Inhibits synthesis of ergosterol, which is a vital component of fungal cell membranes. Also inhibits endogenous respiration, causes accumulation of phospholipids and unsaturated fatty acids within fungal cells, and disrupts chitin synthesis.

Uses

INJECTION: Treatment of aspergillosis, blastomycosis, febrile neutropenia, and histoplasmosis.
CAPSULES: Treatment of aspergillosis, blastomycosis, histoplasmosis, and onychomycosis.
ORAL SOLUTION: Treatment of oropharyngeal or esophageal candidiasis and empirical treatment of febrile neutropenia.

Unlabeled Uses

Treatment of other fungal infections (superficial mycoses [e.g., dermatophytoses]; systemic mycoses [e.g., candidiasis, cryptococcus]; and miscellaneous fungal infections [e.g., SC mycoses, cutaneous *Leishmaniasis*]).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Midazolam: Midazolam toxicity (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS

Incidence and type of reactions vary depending on usage and route of administration. In general, the adverse reactions listed occur in at least 1% of the patients treated.
⚠ **ORAL:** Stomatitis, gingivitis.
CNS: Headache; dizziness; decreased libido; somnolence; vertigo; anxiety; depression; abnormal dreaming.
CVS: Hypertension.
GI: Nausea; vomiting; diarrhea; abdominal pain; anorexia; flatulence; constipation; dyspepsia; gastritis; gastroenteritis; increased appetite; general GI disorders.

RESP: Coughing; dyspnea; testĬtest pneumonia; sinusitis; sputum increased; rhinitis; URI; pharyngitis.
MISC: Edema; fatigue; test [test] danny [test] Atest ΨCaps fever; malaise; myalgia; bursitis; pain; injury; chest pain; back pain; *Pneumocystis carinii* infection; herpes zoster; application site reaction; vein disorder; asthenia; tremor; hypertriglyceridemia; abnormal liver function, hypokalemia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *When prescribed by the DDS:* Ensure patient knows how to take the drug, how long it should be taken, and to immediately report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset). See Chapter 4: *Medical Management of Odontogenic Infections*.
- This drug is associated with severe liver failure in patients with no prior history of liver disease; monitor pharmacokinetics of dental drugs used.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- *Oral candidiasis:* Teach patient how to disinfect removable prostheses.
- Recommend new toothbrush be used after resolution of oral infection.

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ketoconazole (KEY-toe-KOE-nuh-zole)

Nizoral: Tablets: 200 mg; Cream: 2% in an aqueous vehicle; Shampoo: 2% in an aqueous suspension

Apo-Ketoconazole, Novo-Ketoconazole

Akorazol, Conazol, Cremosan, Fungoral, Konaderm, Mycodib, Onofin-K, Termizol, Tiniazol

Drug Class: Anti-infective; Antifungal

PHARMACOLOGY

Action

Impairs synthesis of ergosterol, allowing increased permeability in fungal cell membrane and leakage of cellular components.

Uses

Treatment of susceptible systemic and cutaneous fungal infections.
Topical: Seborrheic dermatitis; tinea corporis; tinea cruris; tinea pedis; tinea versicolor.

Contraindications

Fungal meningitis.

Usual Dosage

Adults: *PO:* 200 to 400 mg once a day. *Topical:* Apply to affected and immediate surrounding area once a day for 2 to 4 wk.
Children Older Than 2 Yr: *PO:* 3.3 to 6.6 mg/kg/day. Treatment may last from 1 wk to 6 mo, depending on infection.

Pharmacokinetics

ABSORP: C_{max} is approximately equal to 3.5 mcg/mL (with a 200-mg dose taken with a meal). T_{max} is 1 to 2 hr. Requires acidity for dissolution and absorption. Absorbed in the GI.
DIST: Approximately 99% protein bound (in vitro), mainly to the albumin fraction. Only a negligible proportion reaches the cerebrospinal fluid.
METAB: Major metabolic pathways are oxidation and degradation of the imidazole and piperazine, oxidative O-dealkylation, and aromatic hydroxylation. It is converted into several inactive metabolites.

EXCRETE: Approximately 13% of dose is excreted in urine; 2% to 4% is unchanged drug. The major route of excretion is through the bile into the intestinal tract. Plasma elimination is biphasic with $t_{1/2}$ of 2 hr during the first 10 hr and $t_{1/2}$ of 8 hr after 10 hr.

DRUG INTERACTIONS

Alcohol: Possible disulfiram-like reaction (mechanism unknown)
- Avoid concurrent use.

Amprenavir: Possible toxicity of ketoconazole and amprenavir (decreased metabolism)
- Avoid concurrent use.

Antacids: Decreased ketoconazole effect (decreased absorption)
- Avoid concurrent use or administer 2 hr apart.

Anticoagulants, oral: Increased anticoagulant effect (decreased metabolism)
- Avoid concurrent use or monitor INR.

Benzodiazepines: Benzodiazepine toxicity (decreased metabolism)
- Monitor clinical status.

Bosentan: Possible increased risk of bosentan toxicity (decreased metabolism)
- Monitor clinical status.

Carbamazepine: Possible carbamazepine toxicity (decreased metabolism)
- Monitor clinical status.

Cilostazol: Possible cilostazol toxicity (decreased metabolism)
- Monitor clinical status.

Cimetidine or ranitidine: Decreased ketoconazole effect (decreased absorption)
- Avoid concurrent use.

Corticosteroids: Possible corticosteroid toxicity (decreased metabolism)
- Monitor clinical status.

Cyclosporine: Renal toxicity (decreased metabolism)
- Avoid concurrent use or monitor cyclosporine concentration.

Delavirdine: Possible delavirdine toxicity (decreased metabolism)
- Monitor clinical status.

Desloratadine: Possible desloratadine toxicity (decreased metabolism)
- Monitor clinical status.

Didanosine: Possible decreased didanosine and ketoconazole effect (decreased absorption)
- Administer 2 hr apart.

Dofetilide: Increased risk of cardiac arrhythmias (decreased metabolism)
- Avoid concurrent use.

Ergot alkaloids: Increased risk of serious vasospastic effect (decreased metabolism)
- Avoid concurrent use.

Esomeprazole: Possible decreased ketoconazole effect (decreased absorption)
- Avoid concurrent use.

Galantamine: Possible increased galantamine effect (decreased metabolism)
- Monitor clinical status.

Imatinib: Possible imatinib toxicity (decreased metabolism)
- Monitor clinical status.

Indinavir: Possible indinavir and ketoconazole toxicity (decreased metabolism)
- Avoid concurrent use of monitor concentration of both drugs.

Isoniazid: Decreased ketoconazole concentration (decreased absorption)
- Avoid concurrent use.

Lansoprazole: Possible decreased ketoconazole effect (decreased absorption)
- Avoid concurrent use.

Lopinavir/ritonavir: Possible ketoconazole toxicity (decreased metabolism)
- Avoid ketoconazole dose greater than 200 mg/day.

Loratadine: Possible loratadine toxicity (decreased metabolism)
- Monitor clinical status.

Lovastatin or simvastatin: Rhabdomyolysis (decreased metabolism)
- Avoid concurrent use.

Nisoldipine: Possible increased risk of nisoldipine toxicity (decreased metabolism)
- Monitor clinical status.

Omeprazole: Decreased ketoconazole effect (decreased absorption); possible decreased omeprazole toxicity (decreased metabolism)
- Avoid concurrent use.

Pantoprazole: Possible decreased ketoconazole effect (decreased absorption)
- Avoid concurrent use.

Pimozide: Increased risk of ventricular arrhythmias (decreased metabolism)
- Avoid concurrent use.

Phenytoin: Altered effect of ketoconazole and/or phenytoin (mechanism unknown)
- Avoid concurrent use.

Quinidine: Possible quinidine toxicity (decreased metabolism)
- Avoid concurrent use.

Rabeprazole: Possible decreased ketoconazole effect (decreased absorption)
- Avoid concurrent use.

Rifabutin: Uveitis (decreased metabolism)
- Monitor clinical status.

Rifampin: Decreased ketoconazole effect (increased metabolism)
- Avoid concurrent use.

Ritonavir: Possible ritonavir and ketoconazole toxicity (mutual decreased metabolism)
- Monitor clinical status.

Saquinavir: Possible saquinavir toxicity (decreased metabolism)
- Monitor clinical status.

Sibutramine: Possible sibutramine toxicity (decreased metabolism)
- Monitor clinical status.

Sirolimus: Possible sirolimus toxicity (decreased metabolism)
- Avoid concurrent use.

Sucralfate: Possible decreased ketoconazole effect (decreased metabolism)
- Avoid concurrent use.

Tacrolimus: Possible tacrolimus toxicity (decreased metabolism)
- Avoid concurrent use or monitor tacrolimus concentration.

Theophylline: Possible decreased theophylline effect (increased metabolism)
- Avoid concurrent use or monitor theophylline concentration.

Tolbutamide: Increased risk of hypoglycemia (decreased metabolism)
- Monitor blood glucose.

Triptans: Possible triptan toxicity (decreased metabolism)
- Monitor clinical status.

Verapamil: Possible verapamil toxicity (decreased metabolism)
- Monitor clinical status.

Ziprasidone: Possible increased ziprasidone toxicity (decreased metabolism)
- Monitor clinical status.

Zolpidem: Possible zolpidem toxicity (decreased metabolism)
- Monitor clinical status.

ADVERSE EFFECTS

CNS: Headache; dizziness; somnolence.
GI: Nausea; vomiting; abdominal pain.
MISC: TABLET: Hepatotoxicity; thrombocytopenia, leukopenia, hemolytic anemia.
CREAM: Pruritus, stinging (5%); cream contains sulfites.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

When prescribed by DDS:
- Ensure patient knows how to take the drug, how long it should be taken and to immediately report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset). See Chapter 4: *Medical Management of Odontogenic Infections*.
- Be aware that cream contains sulfites; do not prescribe when sulfite sensitivity is reported.

- *Lactation:* Undetermined.
- *Children:* Safety and efficacy in children younger than 2 yr not established (PO). Safety and efficacy not established (topical).
- *Anaphylaxis:* Has occurred after the first dose.
- *Gastric acidity:* Ketoconazole requires acid environment for dissolution and absorption.
- *Hormone levels:* May lower serum testosterone or suppress adrenal corticosteroid secretion.

Pregnancy Risk Category: Category C.

Oral Health Education

- When prescribed by the DDS for oral infection, teach patient to clean and disinfect removable appliances daily and to replace toothbrush following resolution of infection.
- Instruct patient that if a dose is missed, take it as soon as possible. If several hr have passed or if close to the time of next dose, do not double up. Notify health care provider if more than one dose is missed.
- Advise patient not to take medication with antacids. If antacids are required, take ketoconazole 2 hr before antacid.
- Emphasize importance of completing full course of therapy, even if signs and symptoms resolve. Advise patient that maintenance therapy may be required for chronic infections.
- Instruct patient to notify health care provider if severe irritation, itching, or stinging occurs after application.
- Instruct patient to report the following symptoms to health care provider: fatigue, loss of appetite, nausea, vomiting, yellowing of skin, dark urine, pale stools, abdominal pain, fever, diarrhea.
- Advise patient that drug may cause drowsiness and to use caution while driving or performing other tasks requiring mental alertness.
- Instruct patient not to take OTC medications, including antihistamine, without consulting health care provider.

J K

ketoprofen (KEY-toe-PRO-fen)

APO-Keto, APO-Keto SR, APO-Keto-E, Novo-Keto, Novo-Keto-EC, Nu-Ketoprofen, Nu-Ketoprofen-SR, Orudis SR, Rhodis, Rhodis SR, Rhodis-EC, Rhovai

Keduril, K-Profen, Profenid

Drug Class: Analgesic; NSAID

PHARMACOLOGY

Action

Decreases inflammation, pain, and fever, probably through inhibition of COX activity and prostaglandin synthesis.

Uses

Treatment of rheumatoid arthritis, osteoarthritis, mild to moderate pain, primary dysmenorrhea.

Sustained-Release Form Only: Treatment of rheumatoid arthritis and osteoarthritis.

OTC Use: Temporary relief of minor aches and pains associated with common cold, headache, toothache, muscular aches, backache, minor arthritis pain, menstrual cramps, and reduction of fever.

Unlabeled Uses

Treatment of juvenile rheumatoid arthritis, sunburn, migraine prophylaxis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Stomatitis (3%), dry mouth, taste disturbance (1%).
CNS: Headache; dizziness; lightheadedness; drowsiness; vertigo.

GI: Peptic ulcer; GI bleeding; dyspepsia (11%); nausea, diarrhea, constipation, abdominal pain (3% to 9%); flatulence; anorexia; vomiting.
RESP: Bronchospasm; laryngeal edema; rhinitis; dyspnea.
MISC: Renal function impairment, increased blood urea nitrogen, edema (3% to 9%); agranulocytosis, thrombocytopenia, anemia (<1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Use COX inhibitors with caution; they may exacerbate PUD and GERD.
- *Arthritis:* consider patient comfort and need for semisupine chair position.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective, nontraumatic self-care.
- Evaluate manual dexterity; consider need for power toothbrush.

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ketorolac tromethamine (KEY-TOR-oh-lak tro-METH-uh-meen)

Acular, Acular LS

Apo-Ketorolac, Apo-Ketorolac Injection, Novo-Ketorolac, Toradol I

Acularen, Alidol, Dola, Dolac, Dolotor, Findol

Drug Class: Analgesic; NSAID

PHARMACOLOGY

Action

Decreases inflammation, pain, and fever, probably through inhibition of COX activity and prostaglandin synthesis.

Uses

ORAL AND IM FORMS: Short-term management of moderately severe, acute pain.
OPHTHALMIC FORM: Relief of ocular itching caused by seasonal allergic conjunctivitis; treatment of postoperative inflammation in patients who have undergone cataract extraction.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Stomatitis (3%); dry mouth.
CNS: Headache (17%); dizziness (7%); drowsiness (6%); sweating (>1%).
CVS: Hypertension (3%).
GI: GI pain (13%); dyspepsia, nausea (12%); diarrhea (7%); constipation, flatulence, GI fullness, vomiting (>1%).
RESP: Bronchospasm.
MISC: Purpura (3%), edema (4%), injection site pain (>1%); muscle cramps; aseptic meningitis; anemia; eosinophilia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken and which dose form. Consider implications of condition on dental treatment.
- Side effects least likely to occur with topical dose form.

- Use COX inhibitors with caution; they may exacerbate PUD and GERD.
- *Arthritis:* Consider patient comfort and need for semisupine chair position.
- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs.

Oral Health Education
- Evaluate manual dexterity; consider need for power toothbrush.

ketotifen fumarate (KEY-toe-TIF-fen FEW-mah-rate)
Zaditor

Kasmal, Ventisol, Zaditen

Drug Class: Antihistamine, ophthalmic

PHARMACOLOGY
Action
Inhibits release of mediators from cells involved in hypersensitivity reactions.

Uses
Temporary prevention of itching of eyes caused by allergic conjunctivitis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
CNS: Headache (10% to 25%).
MISC: Flu-like syndrome (<5%); photophobia.

CLINICAL IMPLICATIONS
General
- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.

kunecatechins (koo-nee-KAT-eh-chins)
Veregen

Drug Class: Catechin

PHARMACOLOGY
Action
The mechanism of action is unknown; however, based on in vitro data, kunecatechins have antioxidative activity.

Uses
Topical treatment of external genital and perianal warts in immunocompetent patients 18 years of age and older.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
MISC: Hypersensitivity (2%).

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Examine oral membranes for presence of condyloma (warts).

Oral Health Education
- Warn about cross-contamination to oral membranes and advise patient to wash hands thoroughly after application, or to use barriers during application.

labetalol HCl (la-BET-uh-lahl HIGH-droe-KLOR-ide)

Normodyne, Trandate

Apo-Labetalol

Midotens

Drug Class: Alpha-adrenergic blocker; Beta-adrenergic blocker

PHARMACOLOGY

Action

Selectively blocks alpha-1 receptors and nonselectively blocks beta-receptors to decrease BP, heart rate, and myocardial oxygen demand.

Uses

Management of hypertension.

Unlabeled Uses

Treatment of pheochromocytoma; management of clonidine-withdrawal hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Reduced antihypertensive effect (reduced prostaglandin synthesis)

- Monitor blood pressure.

Sympathomimetic amines: Decreased antihypertensive effect with epinephrine (pharmacological antagonism)

- Monitor blood pressure. Use local anesthetic agents with vasoconstrictor with caution.

Hypertensive reactions with epinephrine (unopposed alpha-adrenergic stimulation)

- Monitor blood pressure. Use local anesthetic agents with vasoconstrictor with caution.

Decreased antianaphylactic effect of epinephrine (beta blockade)

- Increase epinephrine dosage may be required in anaphylaxis.

ADVERSE EFFECTS

⚠ **ORAL:** Bullous lichen planus.

CNS: Headache; fatigue; dizziness; depression; lethargy; drowsiness; forgetfulness; sleepiness; vertigo; paresthesia; nightmares.

GI: Nausea; vomiting; diarrhea; dyspepsia.

RESP: Bronchospasm; shortness of breath; wheezing.

MISC: Muscle cramps; systemic lupus erythematosus; increased hypoglycemic response to insulin; masking of hypoglycemic signs; asthenia; agranulocytosis; thrombocytopenia; purpura.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Beta blockers may mask epinephrine-induced signs and symptoms of hypoglycemia in patient with diabetes.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries candidiasis, and lichenoid mucositis.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

lamivudine (la-MIH-view-deen)
Synonym: 3TCZ

Epivir, Epivir-HBV

Heptovir

Drug Class: Antiretroviral, nucleoside reverse transcriptase inhibitor

PHARMACOLOGY
Action
Inhibits replication of HIV and hepatitis B virus (HBV).

Uses
HIV infection

EPIVIR: In combination with other antiretroviral agents for the treatment of HIV infection.

Chronic HBV infection

EPIVIR-HBV: Treatment of chronic HBV associated with evidence of HBV replication and active liver inflammation.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Throat infection; stomatitis.

CNS: Headache; neuropathy; dizziness; sleep disturbances; depression; insomnia and other sleep disorders; depressive disorders.

GI: Nausea; vomiting; diarrhea; anorexia; abdominal pain/cramps; dyspepsia.

RESP: Nasal signs and symptoms; cough; paresthesia; abnormal breath sounds/wheezing.

MISC: Malaise; fatigue; fever; chills; myalgia; arthralgia; pancreatitis; elevated liver enzymes; musculoskeletal pain; anaphylaxis; urticaria; rhabdomyolysis; peripheral neuropathy; hepatic steatosis; muscle weakness with creatine phosphokinase elevation; posttreatment exacerbation of hepatitis; redistribution/accumulation of body fat.

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values improve above this level.
- Consider medical consult to determine disease control and influence on dental treatment.
- Anticipate oral candidiasis when HIV disease is reported.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care since HIV infection reduces host resistance.

lamivudine/zidovudine (la-MIH-view-deen/zie-DOE-view-DEEN)
Synonym: zidovudine/lamivudine

Combivir

Drug Class: Antiviral combination

PHARMACOLOGY

Action

Inhibits replication of HIV by incorporation into HIV DNA and producing an incomplete, nonfunctional DNA.

Uses

Treatment of HIV infection.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole: Possible zidovudine toxicity (decreased metabolism)
- Avoid concurrent use.

Clarithromycin: Possible decreased zidovudine effect (mechanism unknown)
- Avoid concurrent use.

ADVERSE EFFECTS

CNS: Headache; fatigue; neuropathy; insomnia; dizziness; depression.

GI: Nausea; diarrhea; vomiting; anorexia; abdominal pain; abdominal cramps; dyspepsia.

RESP: Cough.

MISC: Malaise; fever; chills; myalgia; arthralgia; musculoskeletal pain.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values improve above this level.
- Consider medical consult to determine disease control and influence on dental treatment.
- Anticipate oral candidiasis when HIV disease is reported.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care since HIV infection reduces host resistance.

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lamotrigine (lah-MOE-trih-JEEN)

Lamictal, Lamictal Chewable Dispersible

Drug Class: Anticonvulsant

PHARMACOLOGY

Action

Chemically unrelated to existing antiepileptic drugs (AEDs); precise mechanism(s) unknown. One proposed mechanism suggests inhibition of voltage-sensitive sodium channels, thereby stabilizing neuronal membranes, which modulates presynaptic transmitter release of excitatory amino acids (e.g., glutamate, aspartate).

Uses

Bipolar Disorder: Maintenance treatment of bipolar I disorder to delay the time to occurrence of mood episodes in patients treated for acute mood episodes with standard therapy.

Epilepsy: Adjunctive therapy in the treatment of partial seizures in adults and as adjunctive therapy in the generalized seizures of Lennox-Gastaut syndrome in pediatric and adult patients. Conversion to monotherapy in adults with partial seizures who are receiving treatment with a single enzyme-inducing AED.

Unlabeled Uses

May be useful in adults with generalized tonic-clonic, absence, atypical absence, and myoclonic seizures.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (6%); tooth disorder (3%, unspecified).

CNS: Dizziness (38%); headache (29%); ataxia (22%); somnolence (14%); insomnia (10%); abnormal coordination (7%); incoordination, anxiety (5%); asthenia (≥5%); tremor, depression (4%); convulsions, irritability, speech disorder (3%); concentration disturbance, seizure exacerbation (2%).

GI: Nausea (19%); vomiting (9%); dyspepsia (7%); abdominal pain, diarrhea (6%); constipation (5%); anorexia (2%).

RESP: Rhinitis (14%); pharyngitis (10%); increased cough (8%); sinusitis (≥5%).

MISC: Back pain, fatigue (8%); flu-like syndrome (7%); fever (6%); lymphadenopathy, infection, pain, weight decrease (≥5%); neck pain, arthralgia (2%); photosensitivity (2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Determine level of disease control, type and frequency of seizure, and compliance with medication regimen.
- Monitor for respiratory side effects; consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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lansoprazole (lan-SO-pruh-zole)

Prevacid, Prevacid I.V.

Ilsatec, Ogastro, Ulpax

Drug Class: GI

PHARMACOLOGY

Action

Suppresses gastric acid secretion by blocking "acid (proton) pump" within gastric parietal cells.

Uses

ORAL: Short-term treatment of active duodenal ulcer; to maintain healing of duodenal ulcers; short-term treatment of all grades of erosive esophagitis; maintenance of healing of erosive esophagitis; long-term treatment of pathological hypersecretory conditions, including Zollinger-Ellison syndrome; in combination with amoxicillin plus clarithromycin or amoxicillin alone (in patients intolerant of or resistant to clarithromycin) for the eradication of *Helicobacter pylori* in patients with active or recurrent duodenal ulcers; short-term treatment and symptomatic relief of active benign gastric ulcer (including NSAID-associated gastric ulcer in patients who continue NSAID use and for reducing risk of NSAID-associated gastric ulcer in patients with a history of NSAID-associated gastric ulcer); treatment of heartburn and other symptoms of GERD.

IV: Short-term treatment (up to 7 days) of all grades of erosive esophagitis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole and itraconazole: Possible decreased ketoconazole and itraconazole effect (decreased absorption)
- Monitor clinical status.

Clarithromycin: Possible stomatitis, glossitis, and black tongue (mechanism unknown)
- Avoid concurrent use.

ADVERSE EFFECTS

CNS: Headache (>1%).

GI: Diarrhea (4%); abdominal pain (2%); constipation, nausea (1%); pancreatitis; vomiting.

MISC: Injection site pain/reaction (IV, 1%); anaphylactoid reactions.

CLINICAL IMPLICATIONS

General

- If patient has GI disease, consider semisupine chair position.
- Drugs that lower acidity in intestinal tract may interfere with absorption of some antibiotics (e.g., penicillin, tetracyclines).
- Use COX inhibitors with caution, they may exacerbate PUD and GERD.
- Anticipate chemical erosion of teeth.
- Substernal pain (heartburn) may mimic pain of cardiac origin.

Oral Health Education

- Inform patient not to brush teeth after reflux, but to only rinse mouth with water, then use home fluoride product to minimize chemical-erosion caries.

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latanoprost (lah-TAN-oh-prahst)

Xalatan

Drug Class: Ophthalmic prostaglandin agonist

PHARMACOLOGY

Action

Prostaglandin F_{2a} analog that reduces intraocular pressure (IOP) by increasing the output of aqueous humor.

Uses

For reduction of elevated IOP in patients with open-angle glaucoma or ocular hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

RESP: URI, cold, flu (4%).

MISC: Muscle/joint/back pain; photophobia.

CLINICAL IMPLICATIONS

General

- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.

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leflunomide (leh-FLEW-nah-mide)

Arava

Drug Class: Antirheumatic agent

PHARMACOLOGY

Action

An isoxazole immunomodulatory agent that inhibits dihydro-orotate dehydrogenase and has antiproliferative and anti-inflammatory activity.

Uses
Treatment of active rheumatoid arthritis to reduce signs and symptoms and to retard structural damage.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth, mouth ulcers (3%); gingivitis; aphthous stomatitis; tooth disorder; taste disturbance; candidiasis.

CNS: Dizziness; headache; paresthesia; anxiety; depression; insomnia; neuralgia; neuritis; sleep disorder; vertigo; migraine.

CVS: Hypertension (10%), chest pain (2%), palpitations; tachycardia.

GI: Abdominal pain; anorexia; diarrhea; dyspepsia; gastroenteritis; nausea; vomiting.

RESP: Bronchitis; increased cough; respiratory infection; pharyngitis; pneumonia; rhinitis; sinusitis; asthma; dyspnea; epistaxis; lung disorder.

MISC: Peripheral edema; weight loss; UTI; asthenia; flu-like syndrome; infection; injury, accident; pain; back pain; fever; hernia; malaise; neck pain; pelvic pain; increased sweating; anemia; ecchymoses.

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Arthritis:* Consider patient comfort and need for semisupine chair position.
- Monitor vital signs.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education
- If hands are affected, consider recommendation of powered devices for plaque control.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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letrozole (LET-roe-zole)
Femara

Femara

Drug Class: Aromatase inhibitor

PHARMACOLOGY
Action
A nonsteroidal, competitive inhibitor of the aromatase enzyme system; inhibits the conversion of androgens to estrogens.

Uses
Extended adjuvant treatment of early breast cancer in postmenopausal women who have received 5 years of adjuvant tamoxifen therapy; first-line treatment of postmenopausal women with hormone receptor–positive or hormone receptor–unknown locally advanced or metastatic cancer; advanced breast cancer in postmenopausal women with disease progression following antiestrogen therapy; adjuvant treatment of postmenopausal women with hormone receptor–positive early breast cancer.

Unlabeled Uses
For ovulation stimulation to improve chances of pregnancy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CVS: Hypertension (8%); angina, coronary heart disease, hemiparesis, hemorrhagic or thrombotic strokes, myocardial infarction, myocardial ischemia, portal vein thrombosis, pulmonary edema, thrombophlebitis, transient ischemic attacks, venous thrombosis (2% or less).

CNS: Asthenia (34%); headache (20%); dizziness (14%); fatigue (13%); insomnia (7%); weakness (6%); somnolence (3%); anxiety, depression, vertigo (less than 5%).

GI: Nausea (17%); constipation (11%); diarrhea (8%); vomiting (7%); abdominal pain (6%); anorexia, dyspepsia (4%).

RESP: Dyspnea (18%); cough (13%); chest wall pain (6%).

MISC: Edema (18%); chest pain (8%); infections/infestations (7%); influenza (6%); pain (5%); pleural effusion (less than 5%); second malignancies (2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Malignancy*: Seek medical consultation to determine WBC and platelet count before invasive dental procedures, including periodontal debridement.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.

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levalbuterol HCl (lev-al-BYOO-ter-ol HIGH-droe-KLOR-ide)

Xopenex, Xopenex HFA

Drug Class: Bronchodilator; Sympathomimetic

PHARMACOLOGY

Action

Produces bronchodilation by relaxing bronchial smooth muscles via beta$_2$-adrenergic receptor stimulation.

Uses

Treatment or prevention of bronchospasm in patients with reversible obstructive airway disease.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Pilocarpine: Increased myopia (mechanism unknown)

- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Dizziness, nervousness, tremor, anxiety, hypesthesia of the hand, insomnia, paresthesia; headache (children 6 to 11 yr of age).

GI: Dyspepsia; diarrhea; gastroenteritis; nausea.

RESP: Increased cough; viral infection.

MISC: Flu-like symptoms, accidental injury, pain, leg cramps, lymphadenopathy, myalgia; abdominal pain, asthma, fever (children 6 to 11 yr of age).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse rate) and respiratory function. Uncontrolled disease characterized by wheezing, coughing.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Ensure that bronchodilator inhaler is present at each dental appointment.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Inhalants can dry oral mucosa; anticipate candidiasis, increased calculus, plaque levels, and caries.

Oral Health Education

- Rinse mouth with water after bronchodilator use to prevent dryness.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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levetiracetam (lev-eh-TEER-ah-see-tam)

Keppra

Drug Class: Anticonvulsant

PHARMACOLOGY

Action

Mechanism unknown; may selectively prevent hypersynchronization of epileptiform burst firing and propagation of seizure activity.

Uses

Adjunctive therapy in partial onset seizures in adults with epilepsy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

The following adverse reaction figures were obtained when levetiracetam was added to concomitant antiepileptic drug therapy. The reported frequencies provide one basis to estimate the relative contribution to adverse event incidences.

⚠ **ORAL:** Gingivitis.

CNS: Somnolence (15%); headache (14%); dizziness (9%); depression, nervousness (4%); ataxia, vertigo (3%); amnesia, anxiety, emotional lability, hostility, paresthesia (2%); confusion, convulsion, grand mal convulsion, insomnia, abnormal thinking, tremor (≥1%).

GI: Anorexia (3%); constipation, diarrhea, dyspepsia, gastroenteritis, nausea, vomiting (≥1%).

RESP: Increased cough (2%); bronchitis (≥1%).

MISC: Asthenia (15%); infection (13%, unspecified); pain (7%); abdominal pain, accidental injury, back pain, fever, flu-like syndrome, fungal infection, chest pain, weight gain (≥1%); leukopenia; thrombocytopenia; neutropenia; pancytopenia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Determine level of disease control, type and frequency of seizure, and compliance with medication regimen.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

- This drug is often used in combination with other anticonvulsants that have their own side effect profile to consider.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.

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levocetirizine dihydrochloride (LEE-voe-se-TIR-a-zeen dye-HYE-droe-KLOR-ide)

Xyzal

Drug Class: Antihistamine

PHARMACOLOGY

Action

Inhibition of H_1 receptors.

Uses

Relief of symptoms associated with allergic rhinitis; treatment of uncomplicated skin manifestations of chronic idiopathic urticaria.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (3%).

CVS: Palpitations (postmarketing).

CNS: Somnolence (6%); fatigue (4%); aggression, agitation, convulsion (postmarketing).
CHILDREN 6 TO 12 YEARS OF AGE: Pyrexia (4%); somnolence (3%).

GI: Nausea (postmarketing).

RESP: Dyspnea (postmarketing).
CHILDREN 6 TO 12 YEARS OF AGE: Cough (3%).

MISC: Anaphylaxis; angioneurotic edema, hypersensitivity (postmarketing).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Be aware that patients with multiple allergies are at increased risk for allergy to dental drugs.
- Consider semisupine chair position if postnasal drainage develops.

Oral Health Education

- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.

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levodopa/carbidopa (LEE-voe-DOE-puh/CAR-bih-doe-puh)

Synonym: carbidopa/levodopa

Sinemet 10/100, Sinemet 25/100, Sinemet 25/250, Sinemet CR

Apo-Levocarb, Novo-Levocarbidopa, Nu-Levocarb

Racovel

Drug Class: Antiparkinson

PHARMACOLOGY

Action

Levodopa is precursor of dopamine, which is deficient in parkinsonism patients. Carbidopa has no activity of its own but inhibits decarboxylation of levodopa, making it more available to brain.

Uses

Treatment of symptoms of idiopathic Parkinson disease (paralysis agitans), postencephalitic parkinsonism, and symptomatic parkinsonism associated with carbon monoxide and manganese poisoning.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Benzodiazepines: Decreased levodopa effect (mechanism unknown)

- Use benzodiazepines with caution.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; burning tongue; bitter taste.

CNS: Paranoid delusions; psychotic episodes; depression; suicidal ideation; dementia; convulsions; hallucinations; dizziness; choreiform; dystonic and other involuntary movements.

CVS: Postural hypotension (5%).

GI: Nausea; anorexia; vomiting; GI distress; epigastric pain; GI bleeding; duodenal ulcer.

MISC: Positive Coombs test result; flushing; malaise.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Extrapyramidal behaviors associated with Parkinson disease can complicate access to oral cavity and complicate oral procedures.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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levofloxacin (lee-voe-FLOX-ah-sin)

Levaquin, Quixin

Elequine, Tavanic

Drug Class: Antibiotic, fluoroquinolone

PHARMACOLOGY

Action

Interferes with microbial DNA synthesis.

Uses

Treatment of acute maxillary sinusitis, acute bacterial exacerbation of chronic bronchitis, nosocomial pneumonia, community-acquired pneumonia, skin and skin structure infections,

chronic bacterial prostatitis, UTI, and acute pyelonephritis caused by susceptible strains of specific microorganisms.

OPHTHALMIC USE: Treatment of conjunctivitis caused by susceptible strains of aerobic gram-positive and aerobic gram-negative microorganisms.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Corticosteroids: Possible increased risk of Achilles tendon disorder (mechanism unknown)
- Consider risk/benefit.

ADVERSE EFFECTS

⚠ **ORAL:** Dry, painful mouth (>1%).

CNS: Headache (6%); insomnia (5%); dizziness (3%); anxiety, fatigue (1%); abnormal EEG; encephalopathy.

GI: Nausea (7%); diarrhea (6%); constipation, abdominal pain (3%); dyspepsia, vomiting (2%); flatulence (1%).

RESP: Dyspnea (1%); allergic pneumonitis.

MISC: Pain, chest pain, back pain (1%); anaphylactic shock; anaphylactoid reactions; dysphonia; multisystem organ failure; leukopenia; tendon rupture.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.

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levothyroxine sodium (lee-voe-thigh-ROX-een SO-dee-uhm)

Synonym: L-thyroxine; T_4

Levothroid, Levoxyl, Synthroid

Eutirox, Tiroidine

Drug Class: Thyroid hormone

PHARMACOLOGY

Action

Increases metabolic rate of body tissues; is needed for normal growth and maturation.

Uses

Replacement or supplemental therapy in hypothyroidism; TSH suppression (in thyroid cancer, nodules, goiters, and enlargement in chronic thyroiditis).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Tremors; headache; nervousness; insomnia.

CVS: Palpitations, tachycardia, hypertension, increased pulse pressure, arrhythmia (high doses).

GI: Diarrhea; vomiting.

MISC: Hypersensitivity; weight loss; menstrual irregularities; sweating; heat tolerance; fever; decreased bone density (in women using levothyroxine long term).

CLINICAL IMPLICATIONS

General

- Be aware that uncontrolled thyroid disease poses a risk for CV events during dental treatment; elevated doses of thyroid hormone mimic signs of hyperthyroid disease.
- Monitor blood pressure and pulse rate to determine degree of thyroid disease control.
- Use local anesthetic agents with a vasoconstrictor with caution. Thyroid hormones and epinephrine are synergistic; use aspiration technique.

lidocaine HCl (LIE-doe-cane HIGH-droe-KLOR-ide)

DentiPatch: Patch: 23/2 cm² patch, 46.1/2 cm² patch
Octocaine: Injection: 2% with 1:50,000 epinephrine, 2% with 1:100,000 epinephrine
Xylocaine: Solution: 4%; Jelly: 2%
Xylocaine Viscous: Solution: 2%
Xylocaine HCl: Injection: 0.5% with 1:200,000 epinephrine, 1% with 1:100,000 epinephrine, 1% with 1:200,000 epinephrine, 2% with 1:50,000 epinephrine, 2% with 1:100,000 epinephrine, 2% with 1:200,000 epinephrine, 1.5% with 7.5% dextrose
Xylocaine MPF: Injection: 1% with 1:200,000 epinephrine, 1.5% with 1:200,000 epinephrine, 2% with 1:200,000 epinephrine
Zilactin-L: Liquid: 2.5%
Anestacon, Burn-o-Jel, DermaFlex, Dilocaine, Duo-Trach Kit, ELA-Max, Lidocaine HCl for Cardiac Arrhythmias, Lidocaine HCl in 5% Dextrose, Lidoject-1, Lidoject-2, Lidopen Auto-Injector, Nervocaine, Numby Stuff, Solarcaine Aloe Extra Burn Relief, Xylocaine HCl IV for Cardiac Arrhythmias, Xylocaine MPF

Lidodan Endotracheal, Lidodan Ointment, Lidodan Viscous, Lignospan, Lignospan Forte, Xylocaine CO2, Xylocaine Endotracheal, Xylocaine 4% Sterile Solution, Xylocaine Spinal 5%, Xylocard

Pisacaina, Uvega, Xylocaina

Drug Class: Antiarrhythmic; Local anesthetic

PHARMACOLOGY

Action

Attenuates phase 4 diastolic depolarization, decreases automaticity, decreases action potential duration, and raises ventricular fibrillation threshold; inhibits conduction of nerve impulses from sensory nerves.

Uses

Acute management of ventricular arrhythmias; topical anesthesia in local skin disorders; local anesthesia of accessible mucous membranes.

Unlabeled Uses

Intraosseous or endotracheal administration to pediatric patients with cardiac arrest.

Contraindications

Hypersensitivity to amide local anesthetics; Stokes-Adams syndrome; Wolff-Parkinson-White syndrome; severe degrees of sinuatrial, AV, or intraventricular block in absence of pacemaker; ophthalmic use.

Usual Dosage

4.5 mg/kg (not to exceed 300 mg).
ADULTS: *IM:* 300 mg. May be repeated after 60 to 90 min. *Patch:* Apply patch and allow to remain in place until the desired anesthetic effect is produced for up to 15 min. Use the

lowest dosage for effectiveness. *Topical:* Apply as needed to affected area; use lowest dose possible when applying to mucous membranes.

Pharmacokinetics

ABSORP: Completely absorbed after parenteral administration. Its rate of absorption depends on the site of administration and the presence or absence of a vasoconstrictor.

DIST: Permeates all tissues and crosses the blood-brain and placental barriers.

METAB: Metabolized rapidly by oxidative *N*-dealkylation in the liver.

EXCRET: Metabolites and unchanged drug are excreted in the kidneys. Elimination half-life after an intravenous bolus injection is typically 1.5 to 2 hr.

DRUG INTERACTIONS

Amprenavir: Possible serious toxicity (decreased metabolism)
- Avoid concurrent use.

Arbutamine: Possible increased risk of cardiac arrhythmias (mechanism unknown)
- Avoid concurrent use.

Bupivacaine: Possible lidocaine toxicity (displacement from binding)
- Avoid concurrent use.

Propranolol or metoprolol: Lidocaine toxicity (decreased metabolism)
- Use lidocaine judiciously.

ADVERSE EFFECTS

⚠ **ORAL:** Stinging at injection site; burning, stinging, sloughing, tenderness (with topical application); numbness of lips or tongue and other paresthesias, including heat and cold.

CVS: Hypotension; bradycardia; cardiovascular collapse; cardiac arrest.

CNS: Dizziness; lightheadedness; nervousness; drowsiness; apprehension; confusion; mood changes; hallucinations; tremors.

GI: Nausea; vomiting.

RESP: Respiratory depression or arrest.

MISC: Hypersensitivity reactions. Local reactions, including soreness at IM injection site; venous thrombosis or phlebitis; extravasation; difficulty in speaking, breathing, and swallowing.

CLINICAL IMPLICATIONS

General

When used by dental professional:

- *Lactation:* Excreted in breast milk.
- *Hypersensitivity:* May occur.
- *Renal failure:* Use caution with repeated doses or prolonged use in patients with renal impairment.
- *Hepatic failure:* Use caution with repeated doses or prolonged use in patients with hepatic impairment.
- *Cardiac effects:* Use with caution and in lower doses in patients with CHF, reduced cardiac output, digitalis toxicity, and in the elderly.
- *Malignant hyperthermia:* Has been reported with administration of amide local anesthetics.
- *Methemoglobinemia:* Do not use in patients with congenital or idiopathic methemoglobinemia or in infants younger than 12 mo who are receiving methemoglobin-inducing drugs.
- *Topical use:* May impair swallowing and enhance danger of aspiration; avoid food for 1 hr if used in mouth or throat. Systemic effects can occur following topical use; use lowest possible dose to avoid serious toxicity, shock, or heart block. Monitor blood pressure and pulse.
- *Overdosage:* Confusion, drowsiness, unconsciousness, tremors, convulsions, hypotension, bradycardia, cardiovascular collapse, cardiac arrest, tinnitus, diplopia.

Pregnancy Risk Category: Category B.

Oral Health Education

When used by dental professional:

- Explain that adverse reactions related to the CNS (e.g., drowsiness, confusion, paresthesias, convulsions, respiratory arrest) can occur and are related to CNS toxicity.
- Emphasize importance of not allowing topical solution to come in contact with eyes or broken skin.
- Advise patient not to chew gum or eat food until 60 min after oral anesthetic has been administered.
- Advise patient that drug may cause dizziness or drowsiness and to avoid getting out of bed or walking without assistance.

lidocaine HCl/prilocaine (LIE-doe-cane HIGH-droe-KLOR-ide/PRILL-oh-cane)

Synonym: prilocaine/lidocaine HCl

EMLA: Cream: 2.5% lidocaine and 2.5% prilocaine; Anesthetic Disc: 1 g EMLA emulsion (2.5% lidocaine, 2.5% prilocaine); contact surface approximately 10 cm^2

Oraqix: Gel: 2.5% lidocaine and 2.5% prilocaine; Locally applied by injector device (1.7 g per cartridge)

EMLA Patch

Drug Class: Local anesthetic

PHARMACOLOGY

Action

Stabilizes neuronal membranes by inhibiting the ionic fluxes required for the initiation and conduction of impulses, thereby effecting local anesthetic action.

Uses

As a topical anesthetic for use on normal intact skin for local analgesia or genital mucous membranes for superficial minor surgery and as pretreatment for infiltration anesthesia.

Contraindications

Sensitivity to local anesthetics of the amide type or any component of the product. Precaution in individuals at risk for methemoglobinemia.

Usual Dosage

Periodontal anesthesia

ADULTS AND CHILDREN: *Topical:* Apply thick layer of cream or anesthetic disc to designated site on mucosa. When using an injector devise, insert blunt tip applicator into pocket and inject small amount to fill pocket. Maximum dose is 5 cartridges over a 3-hr period.

Pediatrics (intact skin)

CHILDREN 0 TO 3 MO OR LESS THAN 5 KG: *Topical:* Apply 1 g per 10 cm^2 for a max of 1 hr.
CHILDREN 3 TO 12 MO AND MORE THAN 5 KG: *Topical:* Apply 2 g per 20 cm^2 for a max of 4 hr.
CHILDREN 1 TO 6 YR AND MORE THAN 10 KG: *Topical:* Apply 10 g per 100 cm^2 for a max of 4 hr.
CHILDREN 7 TO 12 YR AND MORE THAN 20 KG: *Topical:* Apply 20 g per 200 cm^2 for a max of 4 hr.

Note: If a patient is older than 3 mo and does not meet the min weight requirement, the max total dose should be restricted to that which corresponds to the patient's weight.

Pharmacokinetics

Lidocaine

ABSORP: Completely absorbed after parenteral administration. Its rate of absorption depends on the site of administration and the presence or absence of a vasoconstrictor.

DIST: Permeates all tissues and crosses the blood-brain and placental barriers.
METAB: Metabolized rapidly by oxidative *N*-dealkylation in the liver.
EXCRET: Metabolites and unchanged drug are excreted in the kidneys. Elimination half-life after an intravenous bolus injection is typically 1.5 to 2 hr.

DRUG INTERACTIONS

See: lidocaine — Drug Interactions
See: prilocaine — Drug Interactions

ADVERSE EFFECTS

⚠ **ORAL:** Application site reactions (e.g., stinging, ulceration, edema, abscess, erythema); taste disturbance.
CVS: Bradycardia; hypotension; cardiovascular collapse leading to arrest.
CNS: CNS excitement or depression; lightheadedness; nervousness; apprehension; euphoria; confusion; dizziness; drowsiness; sensations of hot, cold, or numbness; twitching; tremors; convulsions, unconsciousness; respiratory depression and arrest.
MISC: Allergic and anaphylactoid reactions characterized by urticaria, angioedema, bronchospasm, and shock.

CLINICAL IMPLICATIONS

General

When used by dental professional:
- *Lactation:* Lidocaine and probably prilocaine are excreted in human milk.
- *Children:* Children younger than 7 yr have shown less overall benefit than older children or adults. Do not use in neonates with a gestational age of 37 wk or less.
- *Application:* Application to larger areas or for longer than recommended could result in sufficient absorption causing serious adverse reactions.
- *Methemoglobinemia:* Do not use in patients with congenital or idiopathic methemoglobinemia or in infants younger than 12 mo of age who are receiving treatment with methemoglobin-inducing agents (e.g., acetaminophen, nitrates, phenytoin, sulfonamides).
- *Overdosage:* Confusion, drowsiness, unconsciousness, tremors, convulsions, hypotension, bradycardia, cardiovascular collapse, cardiac arrest, tinnitus, diplopia. (**Caution:** If injectable local anesthetics are used, additive systemic toxicity can occur.)

Pregnancy Risk Category: Category B.

Oral Health Education

When used by dental professional:
- Explain name, dose, action, and potential side effects of medication.
- Caution patient, parent, or guardian that medication may block all skin sensations and to avoid trauma to the treated area by scratching, rubbing, or exposure to extremely hot or cold temperatures until complete sensation has returned.
- Avoid contact of agent with eyes; use protective lenses.

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linezolid (lin-EH-zoe-lid)

Zyvox

Zyvoxam, Zyvoxam IV

Drug Class: Antibiotic; Anti-infective

PHARMACOLOGY

Action

Prevents the formation of a functional 70S initiation complex, which is essential to the bacterial translation process.

Uses

Treatment of vancomycin-resistant *Enterococcus faecium* infections; treatment of nosocomial pneumonia, complicated and uncomplicated skin and skin structure infections, and community-acquired pneumonia caused by susceptible strains of specific organisms.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Sympathomimetic amines: Hypertension (mechanism unknown)
- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Altered taste (2%); tongue discoloration, candidiasis (1%).
CNS: Headache (7%); insomnia, convulsions (3%); dizziness (2%); vertigo (1%); neuropathy.
GI: Diarrhea (11%); vomiting (9%); nausea (6%); generalized and localized abdominal pain; GI bleeding; loose stools; constipation.
RESP: URI (4%); pneumonia, dyspnea (3%); cough, apnea (2%).
MISC: Fever (14%); sepsis (8%); trauma, injection site reactions (3%); fungal infections, localized pain (2%); blood dyscrasias (anemia [5.6%], thrombocytopenia [4.7%], eosinophilia [1%], thrombocythemia [2.8%]).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- Monitor respiratory function; consider semisupine chair position.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias reported; anticipate increased bleeding, infection, and poor healing.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

L

liothyronine sodium (lie-oh-THIGH-row-neen SO-dee-uhm)

Synonyms: T3; triiodothyronine

Cytomel, **Triostat**

Triyotex

Drug Class: Thyroid hormone

PHARMACOLOGY

Action

Increases metabolic rate of body tissues; needed for normal growth and maturation.

Uses

Replacement or supplemental therapy in hypothyroidism; thyroid-stimulating hormone suppression for treatment or prevention of euthyroid goiters (e.g., thyroid nodules, multinodular goiters, enlargement in chronic thyroiditis); diagnostic agent in suppression tests to differentiate suspected hyperthyroidism from euthyroidism; treatment of myxedema coma/precoma (IV).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Tremors; headache; nervousness; insomnia.
CVS: Palpitations; tachycardia; hypertension; increased pulse pressure; arrhythmia (high doses).
GI: Diarrhea; vomiting.

MISC: Hypersensitivity; weight loss; menstrual irregularities; sweating; heat intolerance; fever; decreased bone density (in women using drug long term).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Be aware that uncontrolled thyroid disease poses a risk for cardiovascular events during dental treatment; elevated doses of thyroid hormone mimic signs of hyperthyroid disease.
- Monitor blood pressure and pulse rate to determine degree of thyroid disease control.
- Use local anesthetic agents with a vasoconstrictor with caution. Thyroid hormones and epinephrine are synergistic; use aspiration technique.

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liotrix (LIE-oh-trix)

Thyrolar 1, Thyrolar 1/2, Thyrolar 1/4, Thyrolar 2, Thyrolar 3

Drug Class: Thyroid hormone

PHARMACOLOGY

Action

Increases metabolic rate of body tissues; is needed for normal growth and maturation.

Uses

Replacement or supplemental therapy in hypothyroidism; pituitary thyroid-stimulating hormone suppression in treatment or prevention of various types of euthyroid goiters, including thyroid nodules, subacute or chronic lymphocytic thyroiditis (Hashimoto), multinodular goiter, and management of thyroid cancer; diagnostic agent in suppression tests to differentiate suspected and hyperthyroidism or thyroid gland autonomy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

No adverse drug effects reported.

CLINICAL IMPLICATIONS

General

- Be aware that uncontrolled thyroid disease poses a risk for cardiovascular events during dental treatment; elevated doses of thyroid hormone mimic signs of hyperthyroid disease.
- Use local anesthetic agents with a vasoconstrictor with caution. Thyroid hormones and epinephrine are synergistic; use aspiration technique.
- Monitor blood pressure and pulse rate to determine degree of thyroid disease control.

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lisdexamfetamine dimesylate (lis-DEX-am-FET-a-meen dye-MEH-sih-LATE)

Vyvanse

Drug Class: Amphetamine

PHARMACOLOGY

Action

Prodrug for dextroamphetamine, which is thought to block the reuptake of norepinephrine and dopamine into presynaptic neurons and increase the release of these monoamines into the extraneuronal space.

Uses
Treatment of ADHD.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth (5%); unpleasant taste.
CVS: Cardiomyopathy, hypertension, MI, palpitations, sudden death, tachycardia.
CNS: Insomnia (19%); headache (12%); irritability (10%); dizziness (5%); initial insomnia (4%); affect lability (3%); somnolence, tic (2%); change in libido, depression, dysphoria, exacerbation of motor and phonic tics and Tourette syndrome, overstimulation, psychotic episodes, restlessness, seizures, stroke, tremor.
GI: Upper abdominal pain (12%); vomiting (9%); nausea (6%); constipation, diarrhea.
MISC: Pyrexia (2%); anaphylaxis, angioedema.

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Patients with ADHD may have short attention spans; consider short appointment.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education
- Encourage patient to follow daily plaque control procedures for effective, nontraumatic self-care.

L

lisinopril (lie-SIN-oh-prill)
Prinivil, Zestril

Apo-Lisinopril

Drug Class: Antihypertensive; ACE inhibitor

PHARMACOLOGY
Action
Competitively inhibits angiotensin I-converting enzyme (ACE), prevention of angiotensin I conversion to angiotensin II, a potent vasoconstrictor that also stimulates aldosterone secretion. Results in decrease in sodium and fluid retention, decrease in BP, and increase in diuresis.

Uses
Treatment of hypertension; treatment of heart failure not responding to diuretics and digitalis; treatment of acute MI within 24 hr in hemodynamically stable patients.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth, taste disturbance (1%).
CNS: Dizziness (12%); headache (6%); fatigue (3%).
CVS: Chest pain (3.4%), hypotension (9%), postural hypotension (>1%).
GI: Diarrhea (4%); nausea (2%); vomiting (1%).
RESP: Cough (4%); URI (2%); common cold (1%).
MISC: Chest pain (3%); abdominal pain (2%); asthenia (1%); anaphylactoid reactions; neutropenia, agranulocytosis, leukopenia, thrombocytopenia (rare).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- If coughing is problematic, consider semisupine chair position for treatment.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Susceptible patient with DM may experience severe recurrent hypoglycemia.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.

Oral Health Education

- Encourage daily plaque control procedures for effective self care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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lithium (LITH-ee-uhm)

Eskalith CR, Lithobid, Lithonate, Lithotabs

Carbolith, Duralith, Lithane, PMS-Lithium Carbonate, PMS-Lithium Citrate

Carbolit, Litheum

Drug Class: Antipsychotic; Antimanic

PHARMACOLOGY

Action

Specific mechanism unknown; alters sodium transport in nerve and muscle cells and effects shift toward intraneuronal metabolism of catecholamines.

Uses

Management of bipolar disorder and manic episodes of manic-depressive illness.

Unlabeled Uses

Treatment of neutropenia; unipolar depression; schizoaffective disorder; prophylaxis of cluster headaches; premenstrual tension; tardive dyskinesia; hyperthyroidism; syndrome of inappropriate diuretic hormone (SIADH) secretion; postpartum affective psychosis; corticosteroid-induced psychosis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Lithium toxicity (decreased renal excretion)
- Avoid concurrent use.

Metronidazole: Lithium toxicity (mechanism unknown)
- Avoid concurrent use.

Tetracyclines: Lithium toxicity (decreased renal excretion)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; parotitis; dental caries; taste disturbance; thirst; tongue movements.
CNS: Fine hand tremor; muscle hyperirritability; headache; fatigue; ataxia; dizziness; psychomotor retardation; confusion; dystonia; hallucinations; blackouts; seizures; pseudotumor cerebri; drowsiness; poor memory and intellectual function; muscular weakness; slurred speech.
CVS: Arrhythmia; hypotension; bradycardia.
GI: Anorexia; nausea; vomiting; diarrhea.
MISC: Fever; swollen joints.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- *Geriatric patients:* Use lower dose of opioid.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.

Oral Health Education

- Determine need for power toothbrush for self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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lomefloxacin HCl (low-MUH-FLOX-uh-sin HIGH-droe-KLOR-ide)

Maxaquin

Lomacin

Drug Class: Antibiotic, fluoroquinolone

PHARMACOLOGY

Action

Interferes with microbial DNA synthesis.

Uses

Treatment of infections of the lower respiratory tract and urinary tract caused by susceptible organisms; prevention of UTI in patients undergoing transurethral or transrectal procedures.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Corticosteroids: Possible increased risk of Achilles tendon disorders (mechanism unknown)
- Consider risk/benefit.

ADVERSE EFFECTS

⚠ **ORAL:** Stomatitis, tongue discoloration, taste perversion, dry mouth, candidiasis (<1%).
CNS: Headache (4%); dizziness (2%).
MISC: Photosensitivity (2.3%).
GI: Nausea (4%); diarrhea, abdominal pain (1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If GI side effects occur, consider semisupine chair position.

- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.

loperamide HCl (low-PEHR-uh-mide HIGH-droe-KLOR-ide)

Diar-aid, Imodium, Imodium A-D, Kaopectate II Caplets, Neo-Diaral, Pepto Diarrhea Control

Apo-Loperamide, PMS-Loperamide Hydrochloride, Rhoxal-loperamide

Acanol, Cryoperacid, Pramidal, Raxedin, Top-Dal

Drug Class: Antidiarrheal

PHARMACOLOGY

Action

Slows intestinal motility, affects water and electrolyte movement through intestine, inhibits peristalsis, reduces daily fecal volume, increases viscosity and bulk density of stool, diminishes loss of fluid and electrolytes.

Uses

Control and symptomatic relief of acute nonspecific or chronic diarrhea; reduction in volume of ileostomy output.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Fatigue; drowsiness; dizziness.

GI: Abdominal pain; distention or discomfort; constipation; nausea; vomiting.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

loracarbef (lor-a-KAR-bef)

Carbac

Drug Class: Antibiotic, cephalosporin

PHARMACOLOGY

Action

Binds to proteins in bacterial cell wall, which inhibits cell wall synthesis.

Uses

Treatment of otitis media, acute maxillary sinusitis, pharyngitis, tonsillitis, infections of lower respiratory tract, skin and skin structures, and urinary tract caused by susceptible strains of specific microorganisms.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Candidiasis; glossitis; thirst.
CNS: Headache; somnolence.
CVS: Hypotension; syncope; chest pain; palpitations.
GI: Diarrhea; abdominal pain; nausea; vomiting; anorexia.
RESP: Rhinitis.
MISC: Hypersensitivity; hypoprothrombinemia, platelet dysfunction; pseudomembranous colitis; multiple blood dyscrasias (e.g., thrombocytopenia, leukopenia).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- If GI side effects occur, consider semisupine chair position.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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loratadine (lore-AT-uh-DEEN)

Alavert, Claritin, Claritin Hives Relief, Claritin Non-Drowsy Allergy, Claritin RediTabs, Tavist ND

Apo-Loratadine, Claritin Kids

Clarityne, Lertamine, Lowadina, Sensibit

Drug Class: Antihistamine

PHARMACOLOGY

Action

Competitively antagonizes histamine at the H_1 receptor site.

Uses

Temporarily relieves symptoms caused by hay fever or other upper respiratory allergies (e.g., runny nose, sneezing, itchy/watery eyes, itching of the nose or throat); treatment of chronic idiopathic urticaria.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (3%), thirst; stomatitis.
CNS: Headache (12%); somnolence (8%); fatigue, nervousness (4%); hyperkinesia (3%); paresthesia; dizziness; migraine; tremor; vertigo; impaired concentration; depression; agitation; anxiety; confusion; insomnia; seizures.
CVS: Palpitations; postural hypotension; bradycardia or tachycardia; hypertension or hypotension.
GI: Abdominal pain (2%); anorexia; increased appetite and weight gain; nausea; vomiting; diarrhea; constipation; flatulence; gastritis; dyspepsia; hiccup.

RESP: Wheezing (4%); URI (2%); nasal dryness; pharyngitis; epistaxis; nasal congestion; dyspnea; coughing; rhinitis; hemoptysis; sinusitis; sneezing; bronchospasm; bronchitis; laryngitis.
MISC: Breast pain; arthralgia; myalgia; malaise; chest pain; leg cramps; asthenia; back pain; fever; peripheral edema; blood dyscrasias (e.g., anemia, thrombocytopenia, leukopenia, agranulocytosis).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider semisupine chair position to control effects of postnasal drainage.
- Be aware that patients with multiple allergies are at increased risk for allergy to dental drugs.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function. Uncontrolled disease characterized by postnasal drainage, coughing.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Determine need for power toothbrush for self-care.

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lorazepam (lore-AZE-uh-pam)

Ativan: Injection: 2, 4 mg/mL
Lorazepam: Tablets: 0.5, 1, 2 mg
Lorazepam Intensol: Oral Solution, concentrated: 2 mg/mL

Apo-Lorazepam, Novo-Lorazem, Nu-Loraz

Sinestron

Drug Class: Antianxiety; Benzodiazepine

PHARMACOLOGY

Action

Potentiates action of GABA, resulting in increased neuronal inhibition and CNS depression, especially in limbic system and reticular formation.

Uses

Treatment of anxiety, anxiety associated with depression (oral); preanesthetic medication for sedation/anxiety and decreased recall, status epilepticus (IV).

Unlabeled Uses

Relief of chemotherapy-induced nausea and vomiting; acute alcohol withdrawal; psychogenic catatonia.

Usual Dosage

Antianxiety

ADULTS: *PO:* Usual dose: 2 to 6 mg/day (range, 1 to 10 mg/day) in divided doses; largest dose at bedtime.
ELDERLY/DEBILITATED PATIENTS: *Initial dose:* 1 to 2 mg/day in divided doses; increase gradually.

Status epilepticus

ADULTS: *IV:* Recommended dose 4 mg given at rate of 2 mg/min. If seizures continue or recur after a 10- to 15-min observation period, an additional 4 mg IV may be administered slowly.

Pharmacokinetics

ABSORP: Absolute bioavailability is 90%. T_{max} is about 2 hr. C_{max} is 20 ng/mL after 2 mg dose (dose-dependent).

DIST: 85% protein bound.

METAB: Rapidly conjugated at its 3-hydroxy group into lorazepam glucuronide.

EXCRET: The $t_{1/2}$ is approximately 12 hr for unconjugated lorazepam and approximately 18 hr for lorazepam glucuronide.

DRUG INTERACTIONS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; coated tongue; difficulty swallowing; gingival pain; salivation.

CNS: Drowsiness; confusion; ataxia; dizziness; lethargy; fatigue; apathy; memory impairment; disorientation; anterograde amnesia, restlessness; headache; slurred speech; aphonia; stupor; coma; euphoria; irritability; vivid dreams; psychomotor retardation; paradoxical reactions (e.g., anger, hostility, mania, insomnia).

CVS: Bradycardia or tachycardia; hypertension or hypotension; palpitations.

GI: Constipation; diarrhea; nausea; anorexia; vomiting.

RESP: Partial airway obstruction (injection); respiratory depression.

MISC: Dependence/withdrawal syndrome (e.g., confusion, abnormal perception of movement, depersonalization, muscle twitching, psychosis, paranoid delusions, seizures); pain, burning, redness at IM injection site; blood dyscrasias (e.g., leukopenia, agranulocytosis, thrombocytopenia, others).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present consult with MD to consider medication changes.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection and poor healing.
- *When prescribed by DDS:* May produce sedation, interfere with eye-hand coordination, and the ability to operate mechanical equipment. Inform patient not to drive, sign important papers, or operate mechanical equipment.

Pregnancy Risk Category: Category D. Avoid use, especially during first trimester because of possible increased risk of congenital malformations. Advise women of childbearing age to use effective contraceptive method. Not recommended during labor and delivery.

Oral Health Education

- *When prescribed by DDS:* Warn patient not to drink alcoholic products while taking the drug.
- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective, nontraumatic self-care.

losartan potassium (low-SAHR-tan poe-TASS-ee-uhm)

Cozaar

Drug Class: Antihypertensive; Angiotensin II antagonist

PHARMACOLOGY

Action

Antagonizes the effect of angiotensin II (vasoconstriction and aldosterone secretion) by blocking the angiotensin II receptor (AT_1 receptor) in vascular smooth muscle and the adrenal gland, producing decreased BP.

Uses

Treatment of hypertension; nephropathy in type 2 diabetic patients; reduce risk of stroke in patients with hypertension and left ventricular hypertrophy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole: Possible losartan toxicity (decreased metabolism)
- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Dental pain, dry mouth (1%).

CNS: Dizziness; insomnia; headache.

GI: Diarrhea; dyspepsia; abdominal pain; nausea.

RESP: Cough; sinusitis; upper respiratory infection; pharyngitis.

MISC: Muscle cramps; myalgia; back pain; leg pain; chest pain; edema/swelling; photosensitivity (1%).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- If coughing is problematic, consider semisupine chair position for treatment.
- Susceptible patient with DM may experience severe recurrent hypoglycemia.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

losartan potassium/hydrochlorothiazide (low-SAHR-tan poe-TASS-ee-uhm/high-droe-klor-oh-THIGH-uh-zide)

Synonym: hydrochlorothiazide/losartan potassium

Hyzaar

Drug Class: Antihypertensive, Angiotensin Receptor Blocker

PHARMACOLOGY

Action

Losartan antagonizes the effect of angiotensin II (i.e., vasoconstriction and aldosterone secretion) by blocking the angiotensin II receptor (AT1 receptor) in vascular smooth muscle

and the adrenal gland, producing decreased BP; hydrochlorothiazide inhibits reabsorption of sodium and chloride in ascending loop of Henle and early distal tubules.

Uses

Hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)

- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Dental pain, dry mouth (losartan); sialadenitis (hydrochlorothiazide).

CNS: Dizziness; syncope, anxiety, ataxia, confusion, depression, dream abnormality, hyperesthesia, insomnia, decreased libido, memory impairment, migraine, nervousness, panic disorder, paresthesia, peripheral neuropathy, sleep disorder, somnolence, tremor, vertigo (losartan); restlessness (hydrochlorothiazide).

CVS: Chest pain, edema (>1%).

GI: Abdominal pain; anorexia, constipation, dyspepsia, flatulence, gastritis, vomiting (losartan); pancreatitis, cramping, gastric irritation (hydrochlorothiazide).

RESP: URI; dyspnea, epistaxis, respiratory congestion (losartan); respiratory distress (e.g., pneumonitis, pulmonary edema) (hydrochlorothiazide).

MISC: Back pain; chest pain, facial edema, arm pain, arthralgia, arthritis, fibromyalgia, hip pain, joint swelling, knee pain, leg pain, muscle cramps, muscle weakness, musculoskeletal pain, myalgia, shoulder pain, stiffness (losartan); weakness, fever, muscle spasm (hydrochlorothiazide).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Susceptible patient with DM may experience severe recurrent hypoglycemia.
- Chronic dry mouth is possible; anticipate increased caries candidiasis, and lichenoid mucositis.
- If GI or musculoskeletal side effects occur, consider semisupine chair position.

Oral Health Education

- Determine need for power toothbrush for self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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lovastatin (LOW-vuh-STAT-in)

Altoprev, Mevacor

Apo-Lovastatin, Gen-Lovastatin, ratio-Lovastatin

Drug Class: Antihyperlipidemic, HMG-CoA reductase inhibitor

PHARMACOLOGY

Action

Increases rate at which body removes cholesterol from blood and reduces production of cholesterol in body by inhibiting enzyme that catalyzes early rate-limiting step in cholesterol synthesis; increases HDL; reduces LDL, VLDL, and triglycerides.

Uses

To reduce elevated cholesterol and LDL cholesterol levels in patients with primary hypercholesterolemia (types IIa and IIb [immediate-release only]); to slow progression of coronary atherosclerosis in patients with coronary heart disease; to reduce risk of MI, unstable angina, and coronary revascularization procedures; as an adjunct to diet to reduce total and LDL cholesterol and apolipoprotein B levels in adolescent boys and girls (who are at least 1 yr postmenarche) age 10 to 17 yr with heterozygous familial hypercholesterolemia (immediate-release only). As an adjunct to diet for reduction of elevated total and LDL cholesterol, apolipoprotein B, and triglycerides and to increase HDL cholesterol in patients with primary hypercholesterolemia (heterozygous familial and nonfamilial) and mixed dyslipidemia (Fredrickson types IIa and IIb) when response to diet restricted in saturated fat and cholesterol and to nonpharmacological measures alone has been inadequate (extended-release only).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole, ketoconazole, or itraconazole: Rhabdomyolysis (decreased metabolism)

- Avoid concurrent use.

Clarithromycin: Rhabdomyolysis (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disturbance.

CNS: Headache; dizziness; paresthesia; insomnia.

CVS: Arrhythmia; palpitations; postural hypotension.

GI: Nausea; vomiting; diarrhea; abdominal pain; constipation; flatulence; heartburn; dyspepsia; pancreatitis.

RESP: Sinusitis (6%).

MISC: Myalgia; muscle cramps; myopathy; rhabdomyolysis with increased CPK; arthralgias; infection (11% to 15%, unspecified); hypersensitivity syndrome (e.g., anaphylaxis, angioedema, lupus erythematosus–like syndrome, polymyalgia rheumatica, vasculitis, purpura, thrombocytopenia, leukopenia, hemolytic anemia, arthritis, arthralgia, urticaria, fever, chills, dyspnea, toxic epidermal necrolysis, erythema multiforme).

CLINICAL IMPLICATIONS

General

- High LDL cholesterol concentration is the major cause of atherosclerosis, which leads to CAD (angina, MI); determine degree of CV health and ability to withstand stress of dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection and poor healing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

lubiprostone (loo-bi-PROS-tone)

Amitiza

Drug Class: GI agent

PHARMACOLOGY

Action

Lubiprostone, a locally acting chloride channel activator, activates CIC-2, a normal constituent of the luminal membrane of the human intestine, which enhances a chloride-rich intestinal fluid secretion without altering sodium and potassium serum concentrations. By increasing intestinal fluid secretion, lubiprostone increases intestinal motility, which facilitates the passage of stool and alleviates symptoms associated with chronic idiopathic constipation.

Uses

Treatment of chronic idiopathic constipation in adults.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, GI reflux disease (2%).
CVS: Hypertension (1%).
CNS: Headache (13%); fatigue (7%); dizziness (4%); hypesthesia (3%); anxiety, depression, insomnia, pyrexia (1%).
GI: Nausea (31%); diarrhea (13%); abdominal distension, abdominal pain (7%); flatulence (6%); vomiting (5%); abdominal discomfort, dyspepsia, loose stools (3%); upper or lower abdominal pain (2%); constipation, stomach discomfort, viral gastroenteritis (1%).
RESP: Sinusitis (5%); upper respiratory tract infection (4%); dyspnea (3%); bronchitis, cough (2%).
MISC: Peripheral edema (4%); gastroenteritis, influenza, viral infections (3%); chest discomfort (2%); chest pain (1%).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse rate) and respiratory function.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Inform patient not to brush teeth following reflux, but to only rinse with water, then use home fluoride product to minimize chemical erosion caries.
- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.

magaldrate (MAG-al-drate)

Synonym: hydroxymagnesium aluminate

Iosopan, Riopan

Drug Class: Antacid

PHARMACOLOGY

Action

Neutralizes gastric acid, thereby increasing pH of stomach and duodenal bulb. Increases lower esophageal sphincter tone and inhibits smooth muscle contraction and gastric emptying.

Uses
Symptomatic relief of upset stomach associated with hyperacidity, including heartburn, gastroesophageal reflux, acid indigestion and sour stomach; relief of hyperacidity associated with peptic ulcer, gastritis, peptic esophagitis, gastric hyperacidity, and hiatal hernia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Ketoconazole or itraconazole: Decreased ketoconazole or itraconazole effect (decreased absorption)
- Administer as far apart as possible.

Clorazepate: Decreased oral clorazepate effect (decreased absorption)
- Administer as far apart as possible.

Corticosteroids: Decreased oral corticosteroid effect (decreased metabolism)
- Administer as far apart as possible.

Metronidazole: Decreased metronidazole effect (decreased metabolism)
- Avoid concurrent use.

Tetracyclines: Decreased tetracycline effect (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS
CNS: Neurotoxicity; encephalopathy.

GI: Diarrhea; constipation; intestinal obstruction; rebound hyperacidity.

MISC: Osteomalacia; bone pain; muscular weakness; malaise; decreased fluoride absorption; aluminum accumulation in serum, bone and CNS; milk-alkali syndrome.

CLINICAL IMPLICATIONS
General
- If patient has GI disease, consider semisupine chair position.

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maraviroc (MA-ra-VIR-ok)
Selzentry

Drug Class: Cellular chemokine receptor (CCR) antagonist

PHARMACOLOGY
Action
Selectively binds to CCR5 present on the cell membrane, preventing CCR5-tropic HIV-1 to enter cells.

Uses
In combination with other antiretroviral agents for treatment-experienced patients infected with only CCR5-tropic HIV-1 detectable, who have evidence of HIV-1 replication despite ongoing antiretroviral therapy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Stomatitis, ulceration (3%); tongue neoplasm (unspecified).

CVS: Vascular hypotension disorders (3%); acute cardiac failure, coronary artery disease and occlusion, MI, myocardial ischemia, unstable angina (less than 2%).

CNS: Dizziness/postural dizziness (8%); disturbances in initiating and maintaining sleep (7%); paresthesias and dysesthesias (5%); depressive disorders, disturbances in consciousness, sensory abnormalities (4%); peripheral nephropathies (3%); cerebrovascular accident (less than 2%).

GI: GI and abdominal pain (8%); constipation (5%); dyspeptic signs and symptoms, anal cancer, esophageal carcinoma (less than 2%).

RESP: Upper respiratory tract infection (20%); coughing and associated symptoms (13%); bronchitis, sinusitis (6%); breathing abnormalities (3%); bronchospasm and obstruction, paranasal sinus disorders, pneumonia, respiratory tract disorders (2%).

MISC: Pyrexia (12%); herpes infection (7%); pain and discomfort (4%); folliculitis (3%); condyloma acuminatum, influenza (2%); abdominal neoplasm, basal cell carcinoma, Bowen disease, cholangiocarcinoma, *Clostridium difficile* colitis, lymphoma, septic shock, viral meningitis (less than 2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values improve above this level.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function.
- If GI side effects occur, consider semisupine chair position.
- Anticipate oral candidiasis when HIV disease is reported.
- Advise products for palliative relief of oral manifestations (stomatitis, mucositis, xerostomia, etc.)
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several minutes at the end of the dental appointment before dismissing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care because HIV infection reduces host resistance.
- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.

M

meclizine (MEK-lih-zeen)

Antivert, Antrizine, Dramamine Less Drowsy, Meni-D, Vergon

Bonamine

Drug Class: Antiemetic; Antivertigo; Anticholinergic

PHARMACOLOGY

Action

Acts on CNS to decrease vestibular stimulation and depress labyrinthine activity.

Uses

Prevention and treatment of nausea, vomiting, and dizziness of motion sickness; possibly effective treatment for vertigo of vestibular dysfunction origin.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, nose, throat.

CNS: Drowsiness; excitation; nervousness; restlessness; insomnia; euphoria; vertigo; hallucinations.

CVS: Hypotension; palpitations; tachycardia.

GI: Nausea; vomiting; diarrhea; constipation; anorexia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Anticholinergics have strong xerostomic effects. Anticipate increased caries activity and candidiasis.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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meclofenamate sodium (mek-loe-FEN-uh-mate SO-dee-uhm)

Meclofenamate sodium

Drug Class: Analgesic; NSAID

PHARMACOLOGY

Action

Decreases inflammation, pain and fever, probably through inhibition of COX activity and prostaglandin synthesis.

Uses

Treatment of rheumatoid and osteoarthritis; treatment of primary dysmenorrhea; relief of mild to moderate pain; idiopathic heavy menstrual blood loss.

Unlabeled Uses

Relief of sunburn; pain; migraine (aborts acute attacks).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Stomatitis.

CNS: Headache; vertigo; drowsiness; dizziness; tinnitus.

MISC: Blood dyscrasias (<1%) (e.g., agranulocytosis, hemolytic anemia, leukopenia, neutropenia).

GI: Diarrhea; vomiting; nausea; abdominal pain; dyspepsia; peptic ulcer; GI bleeding; constipation; flatulence; anorexia; heartburn.

RESP: Breathing difficulties in aspirin-sensitive individuals.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Use COX inhibitors with caution, they may exacerbate PUD and GERD.
- *Arthritis:* consider patient comfort and need for semisupine chair position.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.

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medroxyprogesterone acetate (meh-DROX-ee-pro-JESS-tuh-rone ASS-uh-TATE)

Amen, Curretab, Cycrin, Depo-Provera, Provera

Gen-Medroxy, Novo-Medrone, ratio-MPA

Drug Class: Progestin

PHARMACOLOGY

Action

Inhibits secretion of pituitary gonadotropins, thereby preventing follicular maturation and ovulation (contraceptive effect); inhibits spontaneous uterine contraction; transforms proliferative endometrium into secretory endometrium; produces antineoplastic effect in advanced endometrial or renal carcinoma.

Uses

PO: Treatment of secondary amenorrhea and abnormal uterine bleeding caused by hormonal imbalance; reduction of incidence of endometrial hyperplasia in nonhysterectomized postmenopausal women receiving 0.625 mg conjugated estrogen.

PARENTERAL: Prevention of pregnancy; adjunctive and palliative treatment of inoperable, recurrent, and metastatic endometrial or renal carcinoma.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Depression; headache; nervousness; dizziness; insomnia; fatigue; somnolence.

GI: Abdominal pain or discomfort; nausea.

RESP: Pulmonary embolism.

MISC: Breast tenderness; masculinization of female fetus; edema; weight changes, especially weight gain; anaphylactoid reactions; bone mineral density changes, increasing risk of osteoporosis; hyperglycemia; pyrexia; galactorrhea.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.

M

mefenamic acid (MEH-fen-AM-ik ASS-id)

Ponstel

Apo-Mefenamic, Nu-Mefenamic, PMS-Mefenamic Acid, Ponstan

Ponstan

Drug Class: Analgesic; NSAID

PHARMACOLOGY

Action

Decreases inflammation, pain, and fever, probably through inhibition of COX activity and prostaglandin synthesis.

Uses

Relief of moderate pain lasting less than 1 wk; treatment of primary dysmenorrhea.

Unlabeled Uses

Treatment of sunburn, migraine (acute attack), premenstrual syndrome.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; pharyngitis.

CNS: Headache; vertigo; drowsiness; dizziness; insomnia.

GI: Diarrhea; vomiting; abdominal pain; dyspepsia; GI bleeding; nausea; constipation; flatulence.

RESP: Bronchospasm; laryngeal edema; rhinitis; dyspnea; hemoptysis; shortness of breath.

MISC: Autoimmune hemolytic anemia may occur if used long term.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible with long-term use; anticipate increased caries activity and candidiasis.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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meloxicam (mell-OX-ih-kam)

Mobic

Mobicox

Masflex

Drug Class: Analgesic; NSAID

PHARMACOLOGY

Action

Decreases inflammation, pain, and fever, probably through inhibition of COX activity and prostaglandin synthesis.

Uses

Relief of signs and symptoms of osteoarthritis and rheumatoid arthritis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; ulcerative stomatitis.

CNS: Dizziness, headache, insomnia (4%); fatigue, convulsions, paresthesia, tremor, vertigo, abnormal dreaming, anxiety, increased appetite, confusion, depression, nervousness, somnolence (<2%).

CVS: Palpitations, arrhythmia, hypertension or hypotension, syncope (<2%); hot flushes.

GI: Diarrhea (8%); nausea (7%); dyspeptic signs and symptoms (6%); abdominal pain (5%); constipation, flatulence, vomiting (3%); colitis, duodenal ulcer, eructation, esophagitis, gastric ulcer, gastritis, gastroesophageal reflux, GI hemorrhage, hematemesis, hemorrhagic duodenal ulcer, hemorrhagic gastric ulcer, intestinal perforation, melena, pancreatitis, perforated duodenal ulcer, perforated gastric ulcer (<2%).

RESP: URI (8%); coughing (2%); asthma, bronchospasm, dyspnea (<2%).

MISC: Influenza-like symptoms (6%); household accidents, edema, pain (5%); falls (3%); allergic reaction, face edema, fever, malaise, photosensitivity (<2%); anaphylactic reactions including shock; blood dyscrasias (anemia [4%], leukopenia, thrombocytopenia, purpura [<2%]).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.

- Use COX inhibitors with caution; they may exacerbate PUD and GERD.
- *Arthritis:* consider patient comfort and need for semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

memantine HCl (meh-MAN-teen HIGH-droe-KLOR-ide)

Namenda

Drug Class: NMDA receptor antagonist

PHARMACOLOGY

Action

It is postulated that memantine exerts its therapeutic effect as a low to moderate affinity, uncompetitive nervous system *N*-methyl-D-aspartate (NMDA) receptor antagonist by binding preferentially to the NMDA receptor-operated cation channels.

Uses

Treatment of moderate to severe dementia of the Alzheimer type.

Unlabeled Uses

Treatment of vascular dementia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Dizziness (7%); headache, confusion (6%); somnolence, hallucination (3%); transient ischemic attack, cerebrovascular accident, vertigo, ataxia, hypokinesia, aggressive reaction (≥1%).

CVS: Hypertension (4%), syncope (1%).

GI: Constipation (5%); vomiting (3%).

RESP: Coughing (4%); dyspnea (2%); pneumonia (≥1%).

MISC: Pain (3%); fatigue (2%).

CLINICAL IMPLICATIONS

General

- Patient may experience hypotension or hypertension. Monitor vital signs at each appointment; anticipate syncope.
- Ensure that caregiver is present at every dental appointment and understands informed consent.
- If coughing is problematic, consider semisupine chair position for treatment.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- Teach caregiver to assist patient with oral self-care practices.

meperidine HCl (meh-PEHR-ih-deen HIGH-droe-KLOR-ide)

Demerol

Drug Class: Narcotic analgesic

PHARMACOLOGY

Action

Relieves pain by stimulating opiate receptors in CNS; also causes respiratory depression, peripheral vasodilation, inhibition of intestinal peristalsis, sphincter of Oddi spasm, stimulation of chemoreceptors that cause vomiting and increased bladder tone.

Uses

ORAL AND PARENTERAL: Relief of moderate to severe pain.
PARENTERAL: Preoperative sedation; support of anesthesia; obstetrical analgesia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disturbance.

CNS: Lightheadedness; dizziness; sedation; disorientation; incoordination; seizures.

CVS: Bradycardia (frequent); orthostatic hypotension, arrhythmia.

GI: Nausea; vomiting; constipation; abdominal pain.

RESP: Respiratory depression; laryngospasm; depression of cough reflex.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If oral pain requires additional analgesics, consider nonopioid products.
- *Geriatric patients:* Use lower dose of opioid.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is unlikely because this drug is used on a short-term basis for pain management or during surgery.
- *When prescribed by DDS:* Short-term use only; there is no justification for long-term use in the management of dental pain.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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mephobarbital (meh-foe-BAR-bih-tahl)

Mebaral

Drug Class: Sedative and hypnotic; Barbiturate; Anticonvulsant

PHARMACOLOGY

Action

Depresses sensory cortex, decreases motor activity, alters cerebellar function, and produces drowsiness, sedation, and hypnosis.

Uses

As a sedative for relief of anxiety, tension, and apprehension; as an anticonvulsant for the treatment of grand mal and petit mal epilepsy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Doxycycline: Decreased doxycycline effect (increased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

CNS: Agitation; confusion; hyperkinesia; ataxia; CNS depression; nightmares; nervousness; psychiatric disturbance; hallucinations; insomnia; anxiety; dizziness; thinking abnormality; headache.

CVS: Bradycardia, hypotension, syncope (1%).

GI: Nausea; vomiting; constipation.

RESP: Hypoventilation; apnea.

MISC: Hypersensitivity reactions including angioedema, skin rashes, exfoliative dermatitis, fever.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Determine level of disease control, type and frequency of seizure and compliance with medication regimen.
- Depressed or anxious patients may neglect self care. Monitor for plaque control effectiveness.
- Monitor vital signs.

Oral Health Education

- Determine need for power toothbrush for self-care.

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mepivacaine HCl (meh-PIHV-ah-cane HIGH-droe-KLOR-ide)

Carbocaine: Injection: Mepivacaine HCl 1%, 1.5%, 2%, 3%
Carbocaine with Neo-Cobefrin: Injection: Mepivacaine HCl 2% with 1:20,000 levonordefrin
Mepivacaine HCl: Injection: Mepivacaine HCl 3%
Mepivacaine HCl and Levonordefrin: Injection: Mepivacaine HCl 2% with 1:20,000 levonordefrin
Polocaine: Injection: Mepivacaine HCl 1%, 2%, 3%
Polocaine MPF: Injection: Mepivacaine HCl 1.5%, 2%
Polocaine with Levonordefrin: Injection: Mepivacaine HCl 2% with 1:20,000 levonordefrin

Drug Class: Injectable local anesthetic, amide

PHARMACOLOGY

Action

Inhibits ion fluxes across membranes to block nerve action potential.

Uses

Peripheral nerve block (e.g., cervical, brachial, intercostal, pudendal): 1% or 2% solution.
Transvaginal block (paracervical plus pudendal): 1% solution.
Paracervical block in obstetrics: 1% solution.
Caudal and epidural block: 1%, 1.5%, or 2% solution.
Infiltration: 0.5% (via dilution) or 1% solution.
Therapeutic block (pain management): 1% or 2% solution.
Dental procedures (infiltration or nerve block): 3% solution or 2% solution with levonordefrin.

Usual Dosage

Regional anesthesia in the oral health care setting

3% PLAIN OR 2% WITH LEVONORDEFRIN 1:20,000

ADULTS AND CHILDREN: 6.6 mg/kg of body weight, not to exceed 400 mg (3% formulation) or 550 mg (2% with levonordefrin 1:20,000 formulation).

Pharmacokinetics

METAB: Liver.

EXCRET: Kidney (metabolites).

ONSET: 3 to 5 min.

DURATION: 0.75 to 1.50 hr; 2 to 6 hr with epinephrine.

SPECIAL POP: *Renal failure:* Use with caution in patients with renal disease.
Elderly: Repeated doses may cause accumulation of the drug or its metabolites or slow metabolic degradation; give reduced doses.

DRUG INTERACTIONS

Intercurrent use: Mixtures of local anesthetics are sometimes employed to compensate for the slower onset of one drug and the shorter duration of action of the second drug. Toxicity is probably additive with mixtures of local anesthetics, but some experiments suggest synergisms. Exercise caution regarding toxic equivalence when mixtures of local anesthetics are employed. Some preparations contain vasoconstrictors. Keep this in mind when using concurrently with other drugs that may interact with vasoconstrictors.
Sedatives: If employed to reduce patient apprehension during dental procedures, use reduced doses, since local anesthetics used in combination with CNS depressants may have additive effects. Give young children minimal doses of each agent.
Bupivacaine: Mepivacaine toxicity (displacement from binding site)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Trismus; tingling.

CNS: Convulsions, loss of consciousness (overdose).

CVS: Myocardial depression; cardiac arrest; dysrhythmias; bradycardia.

RESP: Status asthmaticus, respiratory arrest, anaphylaxis (allergy).

MISC: Discoloration at injection site; tissue necrosis.

CLINICAL IMPLICATIONS

General

- *Lactation:* Safety for use during lactation has not been established.
- Use the lowest dosage that results in effective anesthesia to avoid high plasma levels and serious adverse effects. Inject slowly, with frequent aspirations before and during the injection, to avoid intravascular injection. Perform syringe aspirations before and during each supplemental injection in continuous (intermittent) catheter techniques. During the administration of epidural anesthesia, it is recommended that a test dose be administered initially and that the patient be monitored for CNS toxicity and cardiovascular toxicity, as well as for signs of unintended intrathecal administration, before proceeding.
- *Inflammation or sepsis:* Use local anesthetic procedures with caution when there is inflammation or sepsis in the region of proposed injection.
- *CNS toxicity:* Monitor cardiovascular and respiratory vital signs and state of consciousness after each injection. Restlessness, anxiety, incoherent speech, lightheadedness, numbness, and tingling of the mouth and lips, metallic taste, tinnitus, dizziness, blurred vision, tremors, twitching, depression, or drowsiness may be early signs of CNS toxicity.
- *Malignant hyperthermia:* Many drugs used during anesthesia are considered potential triggering agents for familial malignant hyperthermia. It is not known whether local anesthetics may trigger this reaction and the need for supplemental general anesthesia cannot be predicted in advance; therefore, have a standard protocol for management available.

- *Vasoconstrictors:* Use solutions containing a vasoconstrictor with caution and in carefully circumscribed quantities in areas of the body supplied by end arteries or having otherwise compromised blood supply (e.g., digits, nose, external ear, penis). Use with extreme caution in patients whose medical history and physical evaluation suggest the existence of hypertension, peripheral vascular disease, arteriosclerotic heart disease, cerebral vascular insufficiency, or heart block; these individuals may exhibit exaggerated vasoconstrictor response. Serious dose-related cardiac arrhythmias may occur if preparations containing a vasoconstrictor such as epinephrine are employed in patients during or following the administration of potent inhalation agents.

Pregnancy Risk Category: Category C.

Oral Health Education

- Advise the patient to exert caution to avoid inadvertent trauma to the lips, tongue, cheek, mucosae, or soft palate when these structures are anesthetized. The ingestion of food should therefore be postponed until normal function returns.
- Advise the patient to consult the dentist if anesthesia persists or a rash develops.

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mesalamine (me-SAL-uh-MEEN)

Synonyms: 5-aminosalicylic acid; 5-ASA

Asacol, Pentasa, Rowasa

Mesacal, Novo-5 ASA, Salofalk

Drug Class: Intestinal anti-inflammatory, Aminosalicylic acid derivative

PHARMACOLOGY

Action

Reduces inflammation of colon topically by preventing production of substances involved in inflammatory processes (e.g., arachidnoic acid).

Uses

Treatment of active, mild to moderate, distal ulcerative colitis, proctosigmoiditis, or proctitis.

Unlabeled Uses

Treatment of Crohn disease.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Pharyngitis (11%); oral ulceration; dry mouth; candidiasis; lichen planus; taste perversion.

CNS: Headache; asthenia; chills; dizziness; fever; sweating; malaise.

GI: Abdominal pain; cramps; discomfort; colitis exacerbation; constipation; diarrhea; dyspepsia; vomiting; flatulence; nausea; eructation; rectal pain; soreness; burning.

RESP: Cough.

MISC: Arthralgia; back pain; hypertonia; myalgia; dysmenorrhea; edema; flu-like syndrome; pain; photosensitivity; blood dyscrasias (e.g., agranulocytosis, leukopenia, thrombocytopenia, others).

CLINICAL IMPLICATIONS

General

- If patient has GI disease, consider semisupine chair position.
- Use COX inhibitors with caution; they may exacerbate PUD and GERD.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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metaproterenol sulfate (MEH-tuh-pro-TEHR-uh-nahl SULL-fate)

Alupent

Drug Class: Bronchodilator; Sympathomimetic

PHARMACOLOGY

Action
Relaxes bronchial smooth muscle through beta-2 receptor stimulation.

Uses
Treatment of bronchial asthma and reversible bronchospasm associated with bronchitis and emphysema; control of acute asthma attacks in children at least 6 yr of age (inhalation solution only).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth, throat; pharyngitis; taste disturbance.
CNS: Tremor; dizziness; nervousness; weakness; headache; shakiness/nervousness/tension; drowsiness; insomnia.
CVS: Tachycardia (<17%); palpitations (4%).
GI: GI distress; nausea; vomiting.
RESP: Cough; asthma exacerbation; asthma exacerbation; hoarseness; nasal congestion.
MISC: Fatigue; skin reaction.

CLINICAL IMPLICATIONS

General
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function. Uncontrolled disease characterized by wheezing, coughing.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Ensure that bronchodilator inhaler is present at each dental appointment.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Inhalants can dry oral mucosa; anticipate candidiasis and increased calculus, plaque levels, and caries activity.

Oral Health Education
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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metaxalone (me-TAX-a-lone)

Skelaxin

Drug Class: Skeletal muscle relaxant

PHARMACOLOGY

Action
Mechanism of action not established but may be caused by general CNS depression. No direct action on the contractile mechanism of striated muscle, the motor endplate, or the nerve fiber. Does not directly relax tense skeletal muscles.

Uses
As an adjunct to rest, physical therapy, and other measures for the relief of discomfort associated with acute, painful, musculoskeletal conditions.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
CNS: Drowsiness; dizziness; headache; nervousness; irritability.

GI: Nausea; vomiting; GI upset.

MISC: Hypersensitivity reaction (i.e., light rash with or without pruritus); leukopenia; hemolytic anemia; jaundice; anaphylactoid reactions (rare).

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased infection and poor healing.

Oral Health Education
- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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metformin HCl (met-FORE-min HIGH-droe-KLOR-ide)
Fortamet, Glucophage, Glucophage XR, Glumetza, Riomet

Apo-Metformin, Gen-Metformin, Novo-Metformin, Nu-Metformin, PMS-Metformin, ratio-Metformin, Rhoxal-metformin, Rhoxal-metformin FC

Dabex, Dimefor, Glucophage Forte

Drug Class: Antidiabetic, biguanide

M

PHARMACOLOGY
Action
Decreases blood glucose by decreasing hepatic glucose production. May also decrease intestinal absorption of glucose and increase response to insulin.

Uses
Adjunct to diet and exercise to lower blood glucose in patients with type 2 diabetes mellitus. Metformin immediate-release (IR) tablets and oral solution are indicated in patients 10 yr of age and older. The extended-release (ER) tablets are indicated in patients 17 yr of age and older. In combination with a sulfonylurea or insulin to improve glycemic control, metformin is indicated in patients 17 yr of age and older.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Taste disorder (1% to 5%).

CNS: METFORMIN IR: Asthenia, headache (≥5%); lightheadedness (1% to 5%).
METFORMIN ER: Dizziness, headache (1% to 5%).

CVS: Palpitation (1% to 5%).

GI: METFORMIN IR: Abdominal discomfort, diarrhea, flatulence, indigestion, nausea/vomiting (≥5%); abnormal stools (1% to 5%).
METFORMIN ER: Diarrhea, nausea/vomiting (≥5%); abdominal distention, abdominal pain, constipation, dyspepsia/heartburn, flatulence (1% to 5%).

RESP: METFORMIN IR: Dyspnea (1% to 5%).
METFORMIN ER: URI (1% to 5%).
MISC: METFORMIN IR: Chest discomfort, chills, flu-like syndrome (1% to 5%).

CLINICAL IMPLICATIONS

General

- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated.
- Monitor BP because hypertension and dyslipidemia (CAD) are prevalent in DM.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin or Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Observe for signs of hypoglycemia (e.g., confusion, argumentativeness, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- Ensure patient has taken medication and eaten meal.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- Medical consult advised if fasting blood glucose is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- *If insulin is used:* Consider time of peak hypoglycemic effect.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.

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methadone HCl (METH-uh-dohn HIGH-droe-KLOR-ide)

Dolophine HCl, Methadose

Metadol

Drug Class: Narcotic analgesic

PHARMACOLOGY

Action

Relieves pain by stimulating opiate receptors in CNS; also causes respiratory depression, peripheral vasodilation, inhibition of intestinal peristalsis, sphincter of Oddi spasm, stimulation of chemoreceptors that cause vomiting and increased bladder tone.

Uses

Management of severe pain; detoxification and temporary maintenance treatment of narcotic addiction.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole: Possible methadone toxicity (decreased metabolism)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Lightheadedness; euphoria; dysphoria; headache; insomnia; dizziness; sedation; disorientation; incoordination.
CVS: Circulatory depression, bradycardia (frequent).
GI: Nausea; vomiting; constipation; abdominal pain.
RESP: Laryngospasm; respiratory depression; depression of cough reflex.
MISC: Tolerance; psychological and physical dependence with long-term use.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If oral pain requires additional analgesics, consider nonopioid products.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.
- Be aware that patient may be taking opioid antagonists and other CNS depressant drugs.

Oral Health Education

- Most patients who abuse substances have poor oral health because of neglect. Encourage daily self-care to prevent periodontal disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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methimazole (meth-IMM-uh-zole)

Tapazole

Drug Class: Antithyroid

PHARMACOLOGY

Action

Inhibits synthesis of thyroid hormones.

Uses

Long-term therapy of hyperthyroidism; amelioration of hyperthyroidism in preparation for subtotal thyroidectomy or radioactive iodine therapy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Taste loss.
CNS: Paresthesias; neuritis; headache; vertigo; drowsiness; neuropathies; CNS stimulation; depression.
GI: Nausea; vomiting; epigastric distress.
MISC: Abnormal hair loss; arthralgia; myalgia; edema; lymphadenopathy; drug fever; interstitial pneumonitis; insulin autoimmune syndrome; agranulocytosis; thrombocytopenia; hypoprothrombinemia; bleeding.

CLINICAL IMPLICATIONS

General

- Be aware that uncontrolled hyperthyroid disease poses a risk for cardiovascular events during dental treatment.
- Monitor blood pressure and pulse rate to determine degree of thyroid disease control.
- Use local anesthetic agents with a vasoconstrictor with caution. Thyroid hormones and epinephrine are synergistic; use aspiration technique.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education
- Encourage daily plaque control procedures for effective, nontraumatic self-care.

methocarbamol (meth-oh-CAR-buh-mahl)

Robaxin, Robaxin-750

Drug Class: Skeletal muscle relaxant, centrally acting

PHARMACOLOGY

Action
May cause relaxation of skeletal muscle via general CNS depression. Does not directly relax tense skeletal muscles.

Uses
Adjunctive therapy for relief of painful, acute musculoskeletal conditions; control of neuromuscular manifestations of tetanus.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Metallic taste.
CNS: Headache; amnesia; confusion; dizziness/lightheadedness; drowsiness; insomnia; mild muscular incoordination; sedation; seizures (including grand mal); vertigo.
GI: Dyspepsia; nausea; vomiting.
MISC: Hypersensitivity reactions, anaphylactic reactions; angioneurotic edema; fever.

CLINICAL IMPLICATIONS

General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *For back pain:* Consider semisupine chair position for patient comfort.

methotrexate (meth-oh-TREK-sate)

Synonyms: amethopterin; MTX

Methotrexate LPF Sodium, Methotrexate Sodium, Methotrexate Sodium, Rheumatrex Dose Pack, Trexall,

ratio-Methotrexate

Ledertrexate, Texate, Trixilem

Drug Class: Antineoplastic; Antimetabolite; Antipsoriatic; Antiarthritic

PHARMACOLOGY

Action
Competitively inhibits dihydrofolic acid reductase and thereby inhibits DNA synthesis and cellular replication. In rheumatoid arthritis, believed to reduce immune function.

Uses
Antineoplastic chemotherapy for treatment of gestational choriocarcinoma, chorioadenoma destruens, hydatidiform mole; treatment and prophylaxis of acute (meningeal) lymphocytic leukemia; treatment of breast cancer, epidermoid cancers of head and neck, advanced mycosis fungoides, and lung cancer; in combination therapy in advanced-stage non-Hodgkin lymphoma; as adjunct in high doses followed by leucovorin rescue in nonmetastatic osteosarcoma (postsurgically); symptomatic control of severe psoriasis and severe rheumatoid arthritis; polyarticular-course juvenile rheumatoid arthritis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Possible methotrexate toxicity (decreased renal clearance)
- Avoid concurrent use.

Tetracyclines: Possible methotrexate toxicity (mechanism unknown)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Stomatitis (3% to 10%).

CNS: Dizziness (1% to 3%); fatigue; headache; aphasia; hemiparesis; paresis; convulsions; leukoencephalopathy (IV after craniospinal irradiation); chemical arachnoiditis; transient paresis; neurotoxicity.

GI: Nausea, vomiting (10%); enteritis (3% to 10%); diarrhea (1% to 3%); abdominal distress (common); anorexia; hematemesis; melena; GI ulceration and bleeding.

RESP: Deaths from interstitial pneumonitis; chronic interstitial obstructive pulmonary disease.

MISC: Malaise; chills; fever; lower resistance to infections; arthralgia; myalgia; diabetes; osteoporosis; anaphylactoid reaction; sudden death; thrombocytopenia, leukopenia; elevated liver function tests (15%); decreased hematocrit.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- Liver and kidney function tests should be completed every 1 to 2 mo; discuss risks associated with using or prescribing drugs.
- Blood dyscrasias reported; anticipate increased bleeding, infection, and poor healing.
- *Arthritis:* Consider patient comfort and need for semisupine chair position.
- Advise products for palliative relief of oral manifestations (e.g., stomatitis, mucositis, xerostomia).

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.

M

methyldopa and methyldopate HCl (meth-ill-DOE-puh and meth-ill-DOE-pate HIGH-droe-KLOR-ide)

Synonym: methyldopate HCl and methyldopa

Aldomet

Apo-Methyldopa, Nu-Medopa,

Drug Class: Antihypertensive; Antiadrenergic, centrally acting

PHARMACOLOGY

Action

Causes central alpha-adrenergic stimulation, which inhibits sympathetic cardioaccelerator and vasoconstrictor centers; reduces plasma renin activity; reduces standing and supine BP.

Uses

Treatment of hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Sympathomimetic amines: Reduced antihypertensive effect (physiological antagonism)
- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; sialoadenitis; discolored tongue; sore tongue.

CNS: Dizziness; sedation; nightmares; headache; asthenia or weakness; paresthesias; lightheadedness; symptoms of cerebrovascular insufficiency; parkinsonism; Bell palsy; decreased mental acuity; involuntary choreoathetotic movements.

CVS: Postural hypotension; bradycardia; edema leading to CHF.

GI: Constipation; nausea; vomiting; distention; flatus; diarrhea.

MISC: Fever; lupus-like syndrome; mild arthralgia or myalgia; bone marrow depression; blood dyscrasias (e.g., leukopenia, granulocytopenia, thrombocytopenia, hemolytic anemia).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Extrapyramidal behaviors can complicate performance of oral procedures. If symptoms present, consult with MD to consider medication changes.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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methylphenidate HCl (meth-ill-FEN-ih-date HIGH-droe-KLOR-ide)

Concerta, Metadate CD, Metadate ER, Methylin, Methylin ER, Ritalin, Ritalin LA, Ritalin-SR

PMS-Methylphenidate, ratio-Methylphenidate

Drug Class: Psychotherapeutic; CNS stimulant

PHARMACOLOGY

Action

Acts as mild cortical stimulant with CNS action; exact mechanism of action unknown.

Uses

Treatment of ADHD; treatment of narcolepsy (Ritalin, Ritalin SR, Metadate ER, Methylin).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Pilocarpine: Increased myopia (mechanism unknown)

- Monitor clinical status.

ADVERSE EFFECTS

CNS: Nervousness; insomnia; dizziness; headache; dyskinesias; drowsiness; convulsions; toxic psychosis; motor tics.

CVS: Arrhythmia, palpitations, blood pressure changes (both increased and decreased).

GI: Anorexia; nausea; abdominal pain; weight loss during prolonged therapy.

RESP: URI; cough; pharyngitis; sinusitis.

MISC: Tourette syndrome; hypersensitivity reactions (e.g., rash, itching, fever, joint pain, exfoliative dermatitis, erythema multiforme, thrombocytopenia, purpura).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Patients with ADHD may have short attention spans; consider short appointment.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.

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methylprednisolone (METH-ill-pred-NIH-suh-lone)

(methylprednisolone acetate, methylprednisolone sodium succinate)

A-Methapred, depMedalone 40, depMedalone 80, Depo-Medrol, Depopred-40, Depopred-80, Duralone-40, Duralone-80, Medralone 40, Medralone 80, Medrol, Solu-Medrol,

Depo-Medrol

Cryosolona

Drug Class: Corticosteroid

PHARMACOLOGY

Action

Depresses formation, release, and activity of endogenous mediators of inflammation including prostaglandins, kinins, histamine, liposomal enzymes, and complement system. Modifies body's immune response.

Uses

Replacement therapy in primary or secondary adrenal cortex insufficiency; adjunctive therapy for short-term administration in rheumatic disorders; exacerbation or maintenance therapy in collagen diseases; treatment of dermatological diseases; control of allergic states or allergic and inflammatory ophthalmic processes; management of respiratory diseases; treatment of hematological disorders; palliative management of neoplastic diseases; management of cerebral edema associated with primary or metastatic brain tumor, craniotomy, or head injury; induction of diuresis in edematous states (due to nephrotic syndrome); management of critical exacerbations of GI diseases; management of acute exacerbations of multiple sclerosis; treatment of tuberculous meningitis; management of trichinosis with neurological or myocardial involvement.

Intra-articular or Soft-Tissue Administration: Adjunctive therapy for short-term administration in synovitis of osteoarthritis, rheumatoid arthritis, bursitis, acute gouty arthritis, epicondylitis, acute nonspecific tenosynovitis, and posttraumatic osteoarthritis.

Intralesional Administration: Management of keloids; treatment of localized hypertrophic, infiltrated, inflammatory lesions of lichen planus, psoriatic plaques, granuloma annulare, lichen simplex chronicus; treatment of discoid lupus erythematosus, necrobiosis lipoidica diabeticorum, alopecia areata, and cystic tumors of aponeurosis or tendon.

Topical Administration: Treatment of inflammatory and pruritic manifestations of corticosteroid-responsive dermatoses.

Unlabeled Uses

Reduction of mortality in severe alcoholic hepatitis; prevention of respiratory distress syndrome; treatment of septic shock; improvement of neurological function in acute spinal cord injury.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole, itraconazole, or clarithromycin: Possible toxicity of methylprednisolone (decreased metabolism)

- Monitor clinical status.

Metronidazole: Decreased metronidazole effect (increased metabolism)

- Avoid concurrent use.

COX-1 inhibitors: Increased risk of peptic ulcers (decreased prostaglandin synthesis)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Ulcerative esophagitis; poor wound healing; masking of infections.

CNS: Convulsions; pseudotumor cerebri (increased intracranial pressure with papilledema); vertigo; headache; neuritis; paresthesias; psychosis.

CVS: Cardiovascular collapse (IV administration).

GI: Pancreatitis; abdominal distention; nausea; vomiting; increased appetite and weight gain; peptic ulcer with perforation and hemorrhage; bowel perforation.

MISC: Musculoskeletal effects (e.g., weakness, myopathy, muscle mass loss, osteoporosis, spontaneous fractures); endocrine abnormalities (e.g., menstrual irregularities, cushingoid state, growth suppression in children, sweating, decreased carbohydrate tolerance, hyperglycemia, glycosuria, increased insulin or sulfonylurea requirements in diabetic patients, hirsutism); anaphylactoid or hypersensitivity reactions; aggravation of infections; fatigue; insomnia; osteonecrosis, tendon rupture, infection, skin atrophy, postinjection flare, hypersensitivity, facial flushing (intra-articular administration). Topical application may produce adverse reactions seen with systemic use because of absorption.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Parenterally administered steroids have greater and more severe side effects than oral dose forms.
- Despite the anticipated perioperative physiological stress (i.e., minor surgical stress), patients undergoing dental care under local anesthesia should take only their usual daily glucocorticoid dose before dental intervention. No supplementation is justified.
- Be aware that signs of bacterial oral infection may be masked and anticipate oral candidiasis.
- If GI side effects occur, consider semisupine chair position.
- *Arthritis:* Consider patient comfort and need for semisupine chair position.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.

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metoclopramide (MET-oh-kloe-PRA-mide)

Maxolon, Octamide, Octamide PFS, Reglan

APO-Metoclop, Maxeran, Metoclopramide Omega, Nu-Metoclopramide, Carnotprim, Clorimet, Meclomid, Plasil, Pramotil

Drug Class: Dopamine antagonist; Antiemetic agent

PHARMACOLOGY

Action

Stimulates upper GI tract motility, resulting in accelerated gastric emptying and intestinal transit and increased resting tone of lower esophageal sphincter. Exerts antiemetic properties through antagonism of central and peripheral dopamine receptors.

Uses

PO: Relief of symptoms associated with acute and recurrent diabetic gastroparesis; short-term therapy of symptomatic, documented gastroesophageal reflux disease in adults who fail to respond to conventional therapy.

PARENTERAL: Prevention of nausea and vomiting associated with emetogenic cancer chemotherapy; prophylaxis of postoperative nausea and vomiting when nasogastric suction is undesirable; facilitation of small bowel intubation when tube does not pass pylorus with conventional maneuvers.

Unlabeled Uses

Treatment of hiccups, migraines, postoperative gastric bezoars, improvement in lactation, radiation-induced emesis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Tardive dyskinesia.
CNS: Dizziness; drowsiness; depression; hallucinations; extrapyramidal symptoms that respond rapidly to treatment with anticholinergic agents (e.g., diphenhydramine IV); exacerbation of Parkinson disease; akathisia.
CVS: Hypertension or hypotension; tachycardia or bradycardia.
GI: Diarrhea.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If patient has GI disease, consider semisupine chair position.
- Use COX inhibitors with caution; they may exacerbate PUD and GERD.
- Extrapyramidal behaviors can complicate performance of oral procedures. If symptoms present, consult with MD to consider medication change.
- Monitor vital signs.

Oral Health Education

- Inform patient that toothbrushing should not be done after reflux, but to only rinse mouth with water, then use home fluoride product to minimize chemical erosion caries.
- Determine need for power toothbrush for self-care.

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metolazone (meh-TOLE-uh-ZONE)

Mykrox, Zaroxolyn

Drug Class: Thiazide-like diuretic

PHARMACOLOGY

Action

Increases urinary excretion of sodium and chloride by inhibiting reabsorption in ascending limb of loop of Henle and early distal tubules.

Uses

Treatment of edema and hypertension.

Unlabeled Uses

Prevention of calcium nephrolithiasis; reduction of postmenopausal osteoporosis; reduction of urine volume in diabetes insipidus.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Rapid-acting formulation: Dry mouth (<2%).

CNS: Rapid-acting formulation: Dizziness; headache; weakness; "weird" feeling; neuropathy; fatigue; lethargy; lassitude; depression. Slow-acting formulation: Dizziness; syncope; neuropathy; vertigo; headache; weakness; fatigue; lethargy; lassitude; anxiety; depression; nervousness.

CVS: Rapid-acting formulation: Orthostatic hypotension, palpitations (<2%); chest pain.

GI: Rapid-acting formulation: Nausea. Slow-acting formulation: Nausea; anorexia; pancreatitis.

RESP: Rapid-acting formulation: Cough; epistaxis; sinus congestion; sore throat.

MISC: Rapid-acting formulation: Impotence; joint pain; back pain; itching eyes; tinnitus; muscle cramps and spasms. Slow-acting formulation: Swelling; chills; acute gouty attack; hyperglycemia; glucosuria; muscle cramps and spasms; leukopenia, agranulocytosis, aplastic anemia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Monitor pulse rhythm to assess for electrolyte imbalance.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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metoprolol (meh-TOE-pro-lahl)

Lopressor, Toprol XL

Apo-Metoprolol, Apo-Metoprolol (Type L), Betaloc, Betaloc Durules, Gen-Metoprolol, Novo-Metoprol, Nu-Metop, PMS-Metoprolol-B, PMS-Metoprolol-B

Kenaprol, Lopresor, Proken M, Prolaken, Ritmolol, Selectadril, Seloken, Selopres

Drug Class: Beta-adrenergic blocker

PHARMACOLOGY

Action

Blocks beta receptors, primarily affecting CV system (e.g., decreases heart rate, decreases contractility, decreases BP) and lungs (e.g., promotes bronchospasm).

Uses

Used alone or in combination with other antihypertensive agents, for management of hypertension, long-term management of angina pectoris, MI (immediate-release tablets and injection), treatment of stable, symptomatic (New York Heart Association class II or III) heart failure of ischemic, hypertensive, or cardiomyopathic origin (Toprol-XL 25 mg only).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Diazepam or clonazepam: Possible diazepam or clonazepam toxicity (decreased metabolism)

- Monitor clinical status.

Lidocaine: Lidocaine toxicity (decreased metabolism)

- Minimize lidocaine dosage.

COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)

- Monitor vital signs.

Sympathomimetic amines: Decreased antihypertensive effect with epinephrine (pharmacological antagonism)

- Monitor blood pressure. Use local anesthetic agents with vasoconstrictor with caution. Hypertensive reactions with epinephrine (unopposed alpha-adrenergic stimulation)
- Increased epinephrine dosage may be required in anaphylaxis.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disturbances.

CNS: Headache; fatigue; dizziness (10%); depression (5%); lethargy; drowsiness; forgetfulness; sleepiness (10%); vertigo; paresthesias.

CVS: Bradycardia; hypotension; arrhythmia.

GI: Nausea; vomiting; diarrhea (5%); gastric pain; constipation; heartburn; flatulence.

RESP: Shortness of breath (3%); bronchospasm; dyspnea; wheezing.

MISC: Increased hypoglycemic response to insulin; may mask hypoglycemic signs; muscle cramps; asthenia; systemic lupus erythematosus; cold extremities; photosensitivity; blood dyscrasias (e.g., leukopenia, agranulocytosis, thrombocytopenia).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Beta blockers may mask epinephrine-induced signs and symptoms of hypoglycemia in patient with diabetes.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

metronidazole (meh-troe-NID-uh-zole)

Flagyl, Protostat : Tablets: 250, 500 mg
Flagyl ER: Tablets, extended-release: 750 mg
Flagyl 375: Capsules: 375 mg
Flagyl I.V.: Powder for Injection, lyophilized: 500 mg
Flagyl I.V. RTU: Injection: 5 mg/mL
Metric 21: Tablets: 250 mg
MetroCream: Cream: 0.75%
MetroGel MetroGel-Vaginal, : Gel: 0.75%
MetroLotion: Lotion: 0.75%
Noritate: Cream: 1%

Apo-Metronidazole, Florazole ER, Nida Gel, Novo-Nidazol

Ameblin, Flagenase, Fresenizol, Milezzol, Nidrozol, Otrozol, Selegil, Servizol, Vatrix-S, Vertisal

Drug Class: Anti-infective

PHARMACOLOGY

Action

Enters bacterial or protozoal cell and impairs synthesis of DNA, resulting in cell death.

Uses

Treatment of serious infections caused by susceptible anaerobic bacteria; prophylaxis of postoperative infection in patients undergoing colorectal surgery; treatment of amebiasis; treatment of trichomoniasis and asymptomatic partners of infected patients; bacterial vaginosis (Flagyl ER only).
TOPICAL: Treatment of inflammatory papules, pustules, and erythema of acne rosacea.
VAGINAL: Treatment of bacterial vaginosis.

Unlabeled Uses

Treatment of hepatic encephalopathy, Crohn disease, antibiotic-associated pseudomembranous colitis, *Helicobacter pylori* infection.

Contraindications

Hypersensitivity to nitroimidazole derivatives or any component of the products; first trimester of pregnancy in patients with trichomoniasis.

Usual Dosage

Anaerobic bacterial infections
ADULTS: *PO:* (Flagyl 375, Flagyl 250-mg tablets) Usual dosage is 7.5 mg/kg (approximately 500 mg for a 70-kg adult) q 6 hr (max, 4 g per 24 hr) for 7 to 10 days.

Pharmacokinetics

ABSORP: Oral metronidazole is well absorbed; topical application is less complete and more prolonged. Following administration, T_{max} is 1 to 2 hr, and C_{max} is 25 mg/mL. Oral bioavailability is not affected by food, but peak serum levels will be delayed to 2 hr.
DIST: Metronidazole appears in cerebrospinal fluid, saliva, and breast milk in concentrations similar to those found in plasma. Less than 20% is protein bound.

METAB: Metabolites are 2-hydroxymethyl and acidic metabolite.
EXCRET: Routes of elimination are via urine (60% to 80%) and feces (6% to 15%). Renal Cl is approximately 10 mL/min per 1.73 m^2. The $t_{1/2}$ is 8 hr in healthy adults, and the hydroxymetabolite $t_{1/2}$ is 15 hr.
SPECIAL POP: *Hepatic failure:* Patients with hepatic dysfunction metabolized metronidazole more slowly: accumulation of drug may occur. Cautiously administer doses below the usual recommended dose.
Elderly: Because the pharmacokinetics of metronidazole may be altered in the elderly, monitoring of serum levels may be necessary to adjust the dosage accordingly.

DRUG INTERACTIONS

Alcohol: Mild disulfiram-like syndrome (inhibition of intermediary metabolism of alcohol)
- Avoid concurrent use.

Cyclophosphamide: Possible increased risk of cyclophosphamide toxicity (mechanism unknown)
- Avoid concurrent use.

Antacids: Possible decreased metronidazole effect (decreased metabolism)
- Avoid clinical use.

Anticoagulants, oral: Increased anticoagulant effect (decreased metabolism)
- Avoid concurrent use.

Phenobarbital: Decreased metronidazole effect (increased metabolism)
- Avoid concurrent use.

Carbamazepine: Possible carbamazepine toxicity
- Avoid concurrent use.

Corticosteroids: Decreased metronidazole effect (increased metabolism)
- Avoid concurrent use.

Cyclosporine: Possible cyclosporine toxicity (decreased metabolism)
- Avoid concurrent use.

Disulfiram: Organic brain syndrome (mechanism unknown)
- Avoid concurrent use.

Fluorouracil: Metronidazole toxicity (decreased metabolism)
- Avoid concurrent use.

Lithium: Lithium toxicity (mechanism unknown)
- Avoid concurrent use.

Phenytoin: Possible phenytoin toxicity (decreased metabolism)
- Avoid concurrent use.

Tacrolimus: Possible tacrolimus toxicity (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS

When known, dose form and percentage are stated.
⚠ **ORAL:** Furry tongue; glossitis; stomatitis.
FLAGYL ER: Metallic taste (9%), dry mouth (2%).
METROGEL VAGINAL: Unusual taste (2%).
CVS: Flattening of T-wave.
CNS: Seizures; peripheral neuropathy; dizziness; vertigo; incoordination; ataxia; confusion; depression; insomnia; syncope; irritability; weakness.
FLAGYL ER: Headache (18%); dizziness (4%).
METROGEL VAGINAL: Headache (5%); dizziness (2%).
GI: Nausea; anorexia; vomiting; diarrhea; constipation; epigastric distress; cramps; pseudomembranous colitis.
FLAGYL ER: Nausea (10%); abdominal pain, diarrhea (4%).
RESP: FLAGYL ER: URI (4%).
MISC: Hypersensitivity reactions including dermatological reactions, nasal congestion, dry vagina, and fever; fleeting joint pain; pancreatitis. Topical or vaginal use may cause similar adverse effects. After prolonged IV use, thrombophlebitis may occur.
FLAGYL ER: Bacterial infection (7%); influenza-like symptoms (6%); moniliasis (3%).

CLINICAL IMPLICATIONS

General

When prescribed by DDS:

- Antibiotic-associated diarrhea can occur. Have patient contact DDS immediately if signs develop.
- *Lactation:* Excreted in breast milk.
- *Children:* Safety and efficacy not established, except for amebiasis.
- *Elderly:* Monitoring serum levels may be necessary for proper dosing.
- *Hepatic failure:* Patients with severe hepatic disease metabolize drug slowly; use caution and lower dose.
- *Candidiasis:* Known or previously unrecognized candidiasis may present more prominent symptoms during therapy.
- *Hematologic effects:* Use with caution in patients with a history of blood dyscrasia.
- *Neurologic effects:* Seizures and peripheral neuropathy have occurred. Use extra caution with prolonged use, high doses, or history of CNS disease.
- *Overdosage:* Nausea, vomiting, ataxia, seizures, peripheral neuropathy.

When prescribed by medical facility:

- Determine why drug is being taken. If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- If GI side effects occur, consider semisupine chair position.

Pregnancy Risk Category: Category B.

Oral Health Education

When prescribed by DDS:

- Explain name, dose, action, and potential side effects of drug.
- Ensure patient knows how to take the drug, how long it should be taken, and to immediately report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset). See Chapter 4: *Medical Management of Odontogenic Infections*.
- Instruct patient to notify health care provider if infection does not appear to be improving or appears to be getting worse.
- Caution patient to avoid alcoholic beverages while taking metronidazole and for at least 3 days following completion of therapy.
- Advise patient that metallic taste is a common side effect of therapy but that this will resolve when therapy has been discontinued.
- Advise patient to report any other bothersome side effects to health care provider and to immediately report any abnormal neurological signs or symptoms (e.g., seizures, extremity numbness, abnormal skin sensations).
- Advise women to notify health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Instruct patient not to take any prescription or OTC medications, dietary supplements, or herbal preparations unless advised by health care provider.
- Advise patient that follow-up examinations and laboratory tests may be required to monitor therapy and to keep appointments.

Tablets and capsules

- Advise patient to take prescribed dose without regard to meals but to take with food if GI upset occurs.

Extended-release tablets

- Advise patient to take prescribed dose daily, 1 hr before or 2 hr after a meal.
- Caution patient to swallow extended-release tablet whole and not crush, chew, or divide.

mexiletine HCl (MEX-ih-leh-teen HIGH-droe-KLOR-ide)

Mexitil

Novo-Mexiletine

Drug Class: Antiarrhythmic

PHARMACOLOGY

Action

Reduces rate of rise of action potential; decreases effective refractory period in Purkinje fibers; has local anesthetic actions.

Uses
Treatment of documented life-threatening ventricular arrhythmias (e.g., sustained ventricular tachycardia).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth (3%), taste disturbance; mucous membrane changes (unspecified).
CNS: Dizziness, lightheadedness (26%); tremor (13%); nervousness (11%); coordination difficulties (10%); headache (8%); changes in sleep habits (7%); weakness (5%); paresthesias, numbness, fatigue (4%); speech difficulties, confusion, clouded sensorium (3%); depression (2%); drowsiness; ataxia.
CVS: Palpitations, chest pain (7.5%); ventricular arrhythmia (2%).
GI: Nausea, vomiting, heartburn (40%); diarrhea (5%); constipation (4%); changes in appetite (3%); abdominal pain, cramps or discomfort (1%); dyspepsia.
RESP: Dyspnea (6%).
MISC: Nonspecific edema (4%); fever (1%); hypersensitivity; blood dyscrasias (e.g., thrombocytopenia, leukopenia, agranulocytosis, neutropenia).

CLINICAL IMPLICATIONS
General
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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micafungin sodium (mi-ka-FUN-gin SO-dee-uhm)
Mycamine

Drug Class: Antifungal agent

PHARMACOLOGY
Action
Inhibits synthesis of 1,3-B-D-glucan, an essential component of fungal cell walls, but not present in mammalian cells.

Uses
Treatment of esophageal candidiasis; prophylaxis of *Candida* infections in patients undergoing hematopoietic stem cell transplantation.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dysgeusia.
CVS: Hypotension (1%); shock (postmarketing).
CNS: Headache (3%); pyrexia (2%); delirium, dizziness, somnolence (1%).
GI: Nausea (3%); abdominal pain, diarrhea, vomiting (2%); dyspepsia (1%).
MISC: Phlebitis (4%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Malignancy*: Seek medical consultation to determine WBC and platelet count before invasive dental procedures, including periodontal debridement.
- Consider medical consult to determine disease control and influence on dental treatment.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Recommend frequent maintenance prophylaxis when immunosuppression is evident.
- Encourage patient to follow daily plaque control procedures for effective self-care

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miconazole (my-KAHN-uh-zole)

Lotrimin AF, M-Zole 3 Combination Pack, M-Zole 7 Dual Pack, Desenex, Monistat 3, Monistat 7, Neosporin AF
Micatin: Cream: 2%; Spray Liquid: 2%; Spray Powder: 2%; Powder: 2%
Tetterine: Ointment: 2%

Micozole, Monistat 1 Combination Pack, Monistat 1 Vaginal Ovule, Monistat 3 Vaginal Ovules, Monistat Derm Cream

Drug Class: Antiinfective, Antifungal agent

PHARMACOLOGY

Action

Alters permeability of fungal cell membrane, leading to cell death.

Uses

PARENTERAL FORM: Treatment of severe systemic fungal infections.
VAGINAL FORM: Local treatment of vulvovaginal candidiasis (moniliasis).
TOPICAL FORM: Treatment of topical fungal infections, including tinea infections and candidiasis.

Contraindications

Hypersensitivity to imidazoles.

Usual Dosage

Systemic Infections

ADULTS: IV 200 to 3,600 mg/day. May divide into 3 doses. Treatment of meningitis is supplemented by intrathecal injections of 20 mg/dose. Treatment of bladder infections is supplemented by bladder instillations of 200 mg per dose.
CHILDREN (1 TO 12 YR OF AGE): IV 20 to 40 mg/kg/day (max, 15 mg/kg/dose).
CHILDREN (YOUNGER THAN 1 YR OF AGE): IV 15 to 30 mg/kg/day (max, 15 mg/kg/dose).

Vaginal Infections

ADULTS: Intravaginal 1 suppository (200 mg) at bedtime for 3 days or 1 suppository (100 mg) for 7 days or 1 applicatorful at bedtime for 7 days.

Topical Infections
ADULTS: Apply twice daily to infected area.

DRUG INTERACTIONS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
CVS: Tachycardia; arrhythmia; cardiorespiratory arrest.
GI: Nausea; vomiting; diarrhea; anorexia.
MISC: Anaphylaxis; fever; chills. Topical or vaginal forms may cause similar reactions.

CLINICAL IMPLICATIONS
General:
When prescribed by medical facility:
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Examine oral mucous membranes for fungal infection.
- This drug would not be prescribed for oropharyngeal candidiasis.

Pregnancy Risk Category: Category C.

microfibrillar collagen hemostat
Synonym: collagen: MCH

Avitene: Fibrous form: 1 g, 5 g; Web form: 70 mm × 70 mm, 70 mm × 35 mm, 35 mm × 35 mm
Hemopad: Fibrous form: 2.5 cm × 5 cm, 5 cm × 8 cm, 8 cm × 10 cm
Hemotene: Fibrous form: 1 g

Drug Class: Hemostat, topical

PHARMACOLOGY
Action
An absorbable topical hemostatic agent that attracts platelets that adhere to the fibrils, triggering aggregation of platelets into thrombi in the collagen mass.

Uses
Adjunct to hemostasis.

Contraindications
Hypersensitivity to any component of the product; contaminated wounds.

Usual Dosage
Bleeding when other means of control are ineffective or impractical
Apply directly to source of bleeding as needed.

Pharmacokinetics
SPECIAL POP: No well-controlled studies for use in pregnant women. Safety for use during pregnancy has not been established.

DRUG INTERACTIONS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
MISC: Allergic reaction; foreign body reaction; potentiation of infection/abscess formation; hematoma; wound dehiscence; and mediastinitis.

CLINICAL IMPLICATIONS

General

- Several min after placement, remove excess material.
- The use of a MCH in dental extraction sockets increases the incidence of alveolalgia.
- Compress with dry sponges immediately prior to application of the dry product, then apply pressure over the hemostat with dry sponge; length of time varies with force and severity of bleeding.
- Adheres to wet gloves, instruments, or tissue surfaces. To facilitate handling, use dry smooth forceps. Do not use gloved fingers to apply pressure.
- Moistening or wetting with saline or thrombin impairs the hemostatic efficacy; use dry and discard any unused portion.

Pregnancy Risk Category: Category C.

midazolam HCl (meh-DAZE-oh-lam HIGH-droe-KLOR-ide)

Syrup: 2 mg/mL; Injection: 1, 5 mg (as hydrochloride)/mL

Apo-Midazolam

Dormicum

Drug Class: General anesthetic; Benzodiazepine

DEA Schedule: Schedule IV

PHARMACOLOGY

Action

Depresses all levels of CNS, including limbic and reticular formation, probably through increased action of GABA, which is major inhibitory neurotransmitter in brain.

Uses

Preoperative sedative; conscious sedation prior to diagnostic, therapeutic, or endoscopic procedures; induction of general anesthesia; supplement to nitrous oxide and oxygen for short surgical procedures; infusion for sedation of intubated and mechanically ventilated patients as a component of anesthesia or during treatment in critical care setting.

Unlabeled Uses

Treatment of epileptic seizures; alternative for the termination of refractory status epilepticus.

Contraindications

Hypersensitivity to benzodiazepines; uncontrolled pain; existing CNS depression; shock; acute narrow-angle glaucoma; acute alcohol intoxication; coma.

Usual Dosage

Preoperative sedative

ADULTS: *IM:* 0.07 to 0.08 mg/kg approximately 1 hr before surgery.

Conscious sedation

ADULTS: *IV:* 1 to 2.5 mg as 1 mg/mL dilution over 2 min. Increase by small increments to total dose of no more than 5 mg in at least 2-min intervals; use less if patient is premedicated with other CNS depressants.

CHILDREN: *IM:* 0.1 to 0.15 mg/kg. Doses up to 0.5 mg/kg have been used for more anxious patients. Total dose usually does not exceed 10 mg.

CHILDREN (YOUNGER THAN 6 MO): *IV:* Titrate in small increments to clinical effect and monitor carefully.

CHILDREN (6 MO TO 5 YR): *IV:* 0.05 to 0.1 mg/kg. Total dose up to 0.6 mg/kg may be necessary. Do not exceed 6 mg.

CHILDREN (6 TO 12 YR): *IV:* 0.025 to 0.05 mg/kg. Total dose up to 0.4 mg/kg. Do not exceed 10 mg.

CHILDREN (12 TO 16 YR): *IV:* Dose as adults.

Pharmacokinetics

ABSORP: Midazolam is rapidly absorbed. The oral AUC ratio of metabolite to midazolam is higher than IV. Mean T_{max} is 0.17 to 2.65 hr and the absolute bioavailability is 36%.

DIST: Midazolam exhibits linear pharmacokinetics (dose 0.25 to 1 mg/kg). Approximately 97% is protein bound (mainly to albumin). The mean steady-state Vd is 1.24 to 2.02 L/kg in children 6 mo to less than 16 yr old receiving 0.15 mg/kg IV.

METAB: Midazolam is subject to substantial intestinal and hepatic first-pass metabolism by cytochrome P450 3A4. Active metabolite is alpha-hydroxymidazolam.

EXCRET: Metabolites excreted in urine.

ONSET: Onset is 10 to 20 min.

SPECIAL POP: *Hepatic failure:* Following oral administration (15 mg), C_{max} and bioavailability were 43% and 100% higher, respectively. The clearance was reduced 40% and $t_{1/2}$ increased 90%. Doses should be titrated.
CHF: Following oral administration (7.5 mg), $t_{1/2}$ increased 43%.

DRUG INTERACTIONS

Alfentanil: Hypotension (decreased sympathetic tone)
- Avoid concurrent use.

Amprenavir: Possible serious life-threatening midazolam toxicity (decreased metabolism)
- Avoid concurrent use.

Corticosteroids: Possible decreased midazolam effect (increased metabolism)
- Monitor clinical status.

Erythromycin, clarithromycin, or roxithromycin: Possible midazolam toxicity (decreased metabolism)
- Avoid concurrent use.

Fluconazole, itraconazole, or ketoconazole: Midazolam toxicity (decreased metabolism)
- Avoid concurrent use.

Lopinavir/ritonavir: Increased midazolam effect (decreased metabolism)
- Avoid concurrent use.

Nelfinavir: Possible midazolam toxicity (decreased metabolism)
- Monitor clinical status.

Propofol: Possible increased midazolam effect (decreased metabolism)
- Monitor clinical status.

Ranitidine: Altered midazolam effect (mechanism unknown)
- Monitor clinical status.

Saquinavir: Prolonged midazolam effect (decreased metabolism)
- Monitor clinical status.

St. John's wort: Decreased midazolam effect (increased metabolism)
- Monitor clinical status.

Theophylline: Decreased midazolam effect (receptor blockade)
- Avoid concurrent use.

Valproate: Possible midazolam toxicity (displacement from binding site)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Excessive salivation; taste disturbance; toothache (unspecified).

CVS: Hypotension (2.3%), vasovagal episode, variations in blood pressure and pulse rate.

CNS: Headache; oversedation; retrograde amnesia; euphoria or dysphoria; confusion; argumentative; anxiety; emergence delirium and dreaming; nightmares; tonic/clonic movements; tremor; athetoid movements; ataxia; dizziness; slurred speech; paresthesia; weakness; loss of balance; drowsiness; nervousness; agitation; restlessness; prolonged emergence from anesthesia; insomnia; dysphonia.

GI: Nausea; vomiting; retching.

RESP: Respiratory depression or arrest; decreased tidal volume, decreased respiratory rate; apnea, coughing; laryngospasm; bronchospasm; dyspnea; hyperventilation; wheezing; shallow respirations; airway obstruction; tachypnea.

MISC: Pain, tenderness, and induration at injection site; yawning; chills; lethargy; weakness; toothache; faint feeling; hematoma; desaturation, apnea, hypotension, paradoxical reactions, hiccups, seizure-like activity, nystagmus (children).

CLINICAL IMPLICATIONS

General

When used or prescribed by DDS:

- Monitor vital signs.
- Geriatric, debilitated, and pediatric patients are more sensitive to the CNS effects of benzodiazepines.
- Warn patient not to drink alcoholic products while taking the drug.
- May produce sedation and interfere with eye-hand coordination and the ability to operate mechanical equipment. Inform patient not to drive, sign important papers, or operate mechanical equipment.
- *Lactation:* Midazolam is excreted in breast milk. Exercise caution when administering to a nursing mother.
- *Children:* As a group, pediatric patients generally require higher dosages of midazolam (mg/kg) than do adults. Pediatric patients (younger than 6 yr) may require higher dosages (mg/kg) than older pediatric patients and may require closer monitoring. In obese pediatric patients, calculate the dose based on ideal body weight.
- *Elderly:* May need to decrease dosage. Titration should be more gradual.
- *Renal failure:* Patients with renal impairment may have longer $t_{1/2}$ for midazolam, which may result in slower recovery.
- *Special risk:* High-risk surgical patients require lower doses. Patients with COPD are unusually sensitive to respiratory depressant effects. In renal or heart failure patients, give less frequently. Exercise care when administering to patients with uncompensated acute illness (e.g., severe fluid or electrolyte disturbances).
- *Hazardous tasks:* No patient should operate hazardous machinery or motor vehicle until the side effects of the drug have subsided or until the day after anesthesia and surgery, whichever is longer.
- *Benzyl alcohol:* The midazolam injection contains benzyl alcohol, which has been associated with a fatal "gasping syndrome" in premature infants.
- *Debilitated patients:* May need to decrease dosage. Titration should be more gradual.
- Serious cardiorespiratory events have occurred, including respiratory depression, airway obstruction, desaturation, permanent neurologic injury, apnea, respiratory arrest or cardiac arrest, sometimes resulting in death.
- *Improper dosing:* Reactions such as agitation, involuntary movements, hyperactivity, and combativeness have been reported.
- *Ophthalmic:* Moderate lowering of intraocular pressure following induction with midazolam.
- *Intracranial pressure/circulatory side effects:* Does not protect against the increase in intracranial pressure or circulatory effects associated with endotracheal intubation under light general anesthesia.
- *Overdosage:* Sedation, impaired coordination and reflexes, hypotension, hypoventilation, somnolence, coma, confusion.
- Continuously monitor patient for hypoventilation or apnea.
- Assist with ambulation after procedure until drowsiness resolves.
- Because serious life-threatening cardiorespiratory events have been reported, make provision for monitoring, detection, and correction of these reactions for every patient regardless of health status.

Pregnancy Risk Category: Category D.

Oral Health Education

When used or prescribed by DDS:

- Inform patient and family preoperatively about possibility of temporary postoperative amnesia.
- Advise patient that drug may cause drowsiness and to use caution while driving or performing other tasks requiring mental alertness until drowsiness has subsided or until day after administration, whichever is longer.

- Advise patient to avoid alcohol and other CNS depressants for 24 hr following administration.
- The patient should inform her health care provider if she is pregnant, planning to become pregnant, or is breast-feeding.
- Patients receiving continuous infusion in critical care settings over an extended period of time may experience symptoms of withdrawal following abrupt discontinuation.

miglitol (mig-LIH-tall)

Glyset

Drug Class: Antidiabetic, alpha-glucosidase inhibitor

PHARMACOLOGY

Action

Inhibits intestinal enzymes that digest carbohydrates, thereby reducing carbohydrate digestion after meals, which lowers postprandial glucose elevation in diabetic patients.

Uses

Patients with type 2 diabetes mellitus who have been failed by dietary therapy. May be used alone or in combination with sulfonylureas.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

GI: Abdominal pain; diarrhea; flatulence.

CLINICAL IMPLICATIONS

General

- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated.
- Monitor blood pressure because hypertension and dyslipidemia (CAD) are prevalent in diabetes mellitus.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin or Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Combination therapy with insulin or sulfonylurea: Observe for signs of hypoglycemia (e.g., confusion, argumentativeness, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- Medical consult advised if fasting blood glucose is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- *If insulin is used:* Consider time of peak hypoglycemic effect.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.
- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.

minocycline HCl (min-oh-SIGH-kleen HIGH-droe-KLOR-ide)

Arestin: Microspheres, sustained-release: 1 mg (as hydrochloride)
Dynacin: Tablets: 50 mg (as hydrochloride); Tablets: 75 mg (as hydrochloride); Tablets: 100 mg (as hydrochloride); Capsules: 50 mg (as hydrochloride); Capsules: 100 mg (as hydrochloride)
Minocin: Capsules, pellet-filled: 50 mg (as hydrochloride); Capsules, pellet-filled: 100 mg (as hydrochloride)

Apo-Minocycline, Gen-Minocycline, Novo-Minocycline, PMS-Minocycline, ratio-Minocycline, Rhoxal-minocycline

Drug Class: Antibiotic, tetracycline

PHARMACOLOGY

Action
Inhibits bacterial protein synthesis.

Uses
Treatment of periodontitis as an adjunct to scaling and root planing. Treatment of infections caused by susceptible strains of gram-positive and gram-negative bacteria, *Rickettsia* and *Mycoplasma* pneumonia, and trachoma; treatment for susceptible infections when penicillins are contraindicated; adjunctive treatment of acute intestinal amebiasis; treatment of asymptomatic carriers of *Neisseria meningitidis* to eliminate meningococci from nasopharynx, chlamydia, inflammatory acne, syphilis, gonorrhea.

Contraindications
Standard considerations.

Usual Dosage
Periodontitis

ADULTS: Subgingival 1-mg microspheres are to be inserted by an oral health care professional.

Susceptible infections

ADULTS: *PO/IV:* 200 mg initially, *then PO/IV:* 100 mg q 12 hr *or PO:* 50 mg qid (max, parenteral 400 mg per 24 hr). Renal impairment: do not exceed 200 mg/24 hr.
CHILDREN OLDER THAN 8 YR OF AGE: *PO/IV:* 4 mg/kg initially, then 2 mg/kg q 12 hr (max, usual adult dose).

Pharmacokinetics
ABSORP: T_{max} is 1 to 4 hr after a single dose. Food does not affect extent of absorption, but C_{max} is slightly decreased and delayed by 1 hr.
DIST: Minocycline has very high lipid solubility, readily penetrates cerebrospinal fluid, and displays a good penetration of saliva, brain, eye, and prostate. 70% to 80% is protein bound.
METAB: Metabolism is concentrated by the liver in the bile.
EXCRET: 1% to 12% is excreted unchanged in urine. Serum $t_{1/2}$ is approximately 11 to 23 hr in healthy volunteers. Hemodialysis and peritoneal dialysis have little effect.
SPECIAL POP: *Renal failure:* Serum $t_{1/2}$ is 18 to 69 hr.
Hepatic failure: Serum $t_{1/2}$ is 11 to 16 hr.

DRUG INTERACTIONS
Amitriptyline: Localized hemosiderosis (possible synergism)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Stomatitis; glossitis; dysphagia; enamel hypoplasia (e.g., in utero, lactation); candidiasis; esophageal ulceration; tooth discoloration; oral cavity discoloration (e.g., tongue, lips, gingivae); Microspheres: taste disturbance

CNS: Convulsions; dizziness; hypoesthesia; paresthesia; sedation; vertigo; bulging fontanelles in infants; benign intracranial hypertension (i.e., pseudotumor cerebri) in adults; headache.

GI: Anorexia; nausea; vomiting; diarrhea; dyspepsia; enterocolitis; pseudomembranous colitis; pancreatitis; inflammatory lesions (with monilial overgrowth) in oral and anogenital regions.

RESP: Cough; dyspnea; bronchospasm; exacerbation of asthma; pneumonitis.

MISC: Fever, discoloration of secretions; brown-black microscopic discoloration of the thyroid gland; photosensitivity; blood dyscrasias (e.g., thrombocytopenia, hemolytic anemia, leukopenia).

CLINICAL IMPLICATIONS

General

When prescribed by DDS:

- *Lactation:* Excreted in breast milk. Advise patient against nursing.
- *Children:* Avoid in children younger than 8 yr of age unless other appropriate drugs are ineffective or contraindicated because abnormal bone formation and discoloration of teeth may occur.
- *Renal failure:* May increase BUN; may lead to azotemia, hyperphosphatemia, and acidosis.
- *Superinfection:* Prolonged use may result in bacterial or fungal overgrowth.
- *Photosensitivity:* May cause exaggerated sunburn reactions.
- *Hepatotoxicity:* Has been reported. Use with caution in patients with hepatic dysfunction and in conjunction with hepatotoxic drugs.
- *Pseudotumor cerebri (benign intracranial hypertension):* Has been reported in adults. Usual manifestations are headache and blurred vision.
- *Tooth discoloration:* May cause permanent discoloration of the teeth.
- *Overdosage:* Dizziness, nausea, vomiting.
- Ensure patient knows how to take the drug, how long it should be taken, and to immediately report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset). See Chapter 4: *Medical Management of Odontogenic Infections*.

When prescribed by medical facility:

- Determine why drug is being taken. If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.

Pregnancy Risk Category: Category D.

Oral Health Education

When prescribed by DDS:

- Explain name, dose, action, and potential side effects of drug.
- Review dosing schedule and prescribed length of therapy with patient. Advise patient that dose and duration of therapy are dependent on site and cause of infection.
- Instruct patient using capsules to take prescribed dose with a full glass of water.
- Instruct patient or caregiver using oral suspension to measure and administer prescribed dose using dosing spoon, dosing syringe, or medicine cup.
- Advise patient to take without regard to meals, but to take with food if GI upset occurs.
- Advise patient to take 1 hr before or 2 hr after antacids containing aluminum, calcium, or magnesium, or preparations containing iron or zinc.

- Instruct patient to complete entire course of therapy, even if symptoms of infection have disappeared.
- Advise patient to discontinue therapy and contact health care provider immediately if skin rash, hives, itching, shortness of breath, headache, or blurred vision occurs.
- Advise patient that medication may cause photosensitivity and to avoid unnecessary exposure to sunlight or tanning lamps and to use sunscreens and wear protective clothing to avoid photosensitivity reactions.
- Caution women taking oral contraceptives that minocycline may make birth control pills less effective and to use nonhormonal forms of contraception during treatment.
- Advise women to notify health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Caution patient that drug may cause dizziness, light-headedness, or blurred vision and to use caution while driving or performing other hazardous tasks until tolerance is determined.
- Advise patient to report signs of superinfection to health care provider: black furry tongue, white patches in mouth, foul-smelling stools, or vaginal itching or discharge.
- Warn patient that diarrhea containing blood or pus may be a sign of a serious disorder and to seek medical care if noted and not treat at home.
- Caution patient not to take any prescription or OTC medications, dietary supplements, or herbal preparations unless advised by health care provider.
- Advise patient to discard any unused minocycline by the expiration date noted on the label.
- Advise patient that follow-up examinations and laboratory tests may be required to monitor therapy and to keep appointments.

Subgingival Microspheres

- Caution patient to avoid touching treated areas and to avoid brushing for 12 hr following treatment. Advise patient to avoid eating hard, crunchy, or sticky foods for 1 wk following treatment and postpone use of interproximal cleaning devices for 10 days.
- Advise patient that mild to moderate sensitivity is expected after treatment, but to notify dental professional immediately if pain, swelling, or other problems occur.

When prescribed by medical facility:

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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minoxidil (min-OX-ih-dill)

Minoxidil for Men, Monoxidil, Rogaine

APO-Gain Topical Solution

Regaine

Drug Class: Antihypertensive; Topical hair growth

PHARMACOLOGY

Action

Directly dilates vascular smooth muscle by mechanism possibly related to blockade of calcium uptake or stimulation of catecholamine release; reduces elevated systolic and diastolic BP by decreasing peripheral arteriolar resistance; triggers sympathetic, vagal inhibitory, and renal homeostatic mechanisms including increased renin release, which results in increased cardiac rate and output and fluid retention; stimulates hair growth by unknown mechanism, but likely is related to its arterial vasodilating action.

Uses

ORAL FORM: Management of severe hypertension associated with target organ damage in patients who have failed to respond to maximal doses of a diuretic plus two other antihypertensive drugs.

TOPICAL FORM: Treatment of androgenic alopecia.

Unlabeled Uses

Treatment of alopecia areata (topical).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Headache; dizziness, faintness (topical); fatigue (systemic).
CVS: Tachycardia.
GI: Diarrhea; nausea; vomiting.
MISC: Temporary edema (7%); breast tenderness (<1%); darkening of skin; thrombocytopenia, leukopenia (rare) (systemic).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

---

mirtazapine (mer-TAZ-ah-peen)

Remeron

Drug Class: Tetracyclic antidepressant

M

PHARMACOLOGY

Action

Unknown. May enhance central nonadrenergic and serotonergic activity.

Uses

Treatment of depression.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (25%), thirst; glossitis; candidiasis; aphthous ulceration.
CNS: Somnolence; asthenia; dizziness; abnormal dreams; abnormal thinking; tremor; confusion; hypesthesia; apathy; depression; hypokinesis; twitching; agitation; anxiety; amnesia; hyperkinesia; paresthesia.
CVS: Hypertension, vasodilatation (>1%).
GI: Nausea; constipation; vomiting; appetite changes; abdominal pain.
RESP: Cough; dyspnea.
MISC: Flu-like syndrome; back pain; myasthenia; myalgia; arthralgia; peripheral edema.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.

- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Extrapyramidal behaviors can complicate performance of oral procedures. If symptoms present, consult with MD to consider medication changes.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.
- *Tremor, extrapyramidal signs:* Determine need for power toothbrush for self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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misoprostol (MY-so-PRAHST-ole)

Cytotec

Apo-Misoprostol, Novo-Misoprostol

Drug Class: Prostaglandin

PHARMACOLOGY

Action

Synthetic prostaglandin E_1 analog that inhibits gastric acid secretion and exerts mucosal-protective properties.

Uses

Prevention of gastric ulcers in high-risk patients who are taking NSAIDs.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Headache (2%).

GI: Diarrhea (14% to 40% [dose-related]); abdominal pain (13% to 20%); nausea, flatulence (3%); dyspepsia (2%); vomiting, constipation (1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Avoid prescribing opioids for dental pain. Acetaminophen is appropriate if GI bleeding is present.
- If GI side effects occur, consider semisupine chair position.
- Consider acetaminophen for oral pain control.

---

modafinil (moe-DAFF-ih-nill)

Provigil

Alertec

Drug Class: CNS stimulant; Analeptic

PHARMACOLOGY

Action

Wakefulness-promoting agent; however, precise mechanism(s) unknown.

Uses

Improve wakefulness in patients with excessive daytime sleepiness associated with narcolepsy, obstructive sleep apnea/hypopnea syndrome, and shift work sleep disorder.

Unlabeled Uses
Treatment of fatigue associated with multiple sclerosis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Triazolam: Reduced triazolam effect (increased metabolism)
- Monitor clinical status.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth (4%), mouth ulceration, thirst, taste disturbance (1%).
CNS: Headache (34%); nervousness (7%); anxiety, dizziness, insomnia (5%); depression, emotional lability, paresthesia, somnolence (2%); anxiety, confusion, dyskinesia, hyperkinesias, hypertonia, tremor, vertigo (1%); symptoms of mania or psychosis.
CVS: Hypertension (3%); tachycardia, vasodilation, palpitation (2%).
GI: Nausea (11%); diarrhea (6%); dyspepsia (5%); anorexia, constipation (2%); flatulence.
RESP: Lung disorder (2%); asthma (1%).
MISC: Flu-like syndrome (4%); chest pain (3%); chills (1%); agranulocytosis.

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment. Anticipate short attention span.
- Extrapyramidal behaviors can complicate performance of oral procedures. If symptoms present, consult with MD to consider medication changes.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education
- Determine need for power toothbrush for self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

M

moexipril HCl (moe-EX-ah-pril HIGH-droe-KLOR-ide)
Univasc

Drug Class: Antihypertensive; ACE inhibitor

PHARMACOLOGY
Action
Competitively inhibits angiotensin I-converting enzyme, preventing conversion of angiotensin I to angiotensin II, which is a potent vasoconstrictor and also stimulates aldosterone secretion from the adrenal cortex. This results in decrease in sodium and fluid retention, decrease in BP, and increase in diuresis.

Uses
Treatment of hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
COX-1 inhibitors: Reduced antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

ADVERSE EFFECTS
CNS: Dizziness (4%); fatigue (2%).
GI: Diarrhea (3%).
RESP: Cough (6%).
MISC: Flu syndrome (3%); flushing (2%); anaphylactoid reactions.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- If coughing is problematic, consider semisupine chair position for treatment.
- Susceptible patient with DM may experience severe recurrent hypoglycemia.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.

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mometasone furoate (moe-MET-uh-SONE FYU-roh-ate)

Asmanex Twisthaler, Elocon, Nasonex

Elocom

Drug Class: Corticosteroid

PHARMACOLOGY

Action

Medium-potency topical corticosteroid that depresses formation, release, and activity of endogenous mediators of inflammation including prostaglandins, kinins, histamine, liposomal enzymes, and complement system; modifies body's immune response.

Uses

TOPICAL: Relief of inflammatory and pruritic manifestations of corticosteroid-responsive dermatoses.

INTRANASAL: Treatment of nasal symptoms of seasonal allergic and perennial allergic rhinitis; prophylaxis of nasal symptoms of seasonal allergic rhinitis; treatment of nasal polyps.

ORAL INHALATION: Maintenance treatment of asthma as prophylactic therapy; in asthma patients requiring oral corticosteroid therapy, adding Asmanex Twisthaler may reduce or eliminate the need for oral corticosteroids.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: INTRANASAL: Headache (≥5%).
ORAL INHALATION: Headache (≥3%); insomnia (1% to 3%).
Oral: INTRANASAL: Taste disturbance, dysphagia.
ORAL INHALATION: Oral candidiasis (≥3%).
GI: INTRANASAL: Vomiting (≥5%); diarrhea, nausea (2% to 5%).
ORAL INHALATION: Abdominal pain, dyspepsia, nausea (≥3%); anorexia, flatulence, gastroenteritis, vomiting (1% to 3%).
RESP: INTRANASAL: Coughing, epistaxis, sinusitis, upper respiratory tract infection (≥5%); asthma, bronchitis, wheezing (2% to 5%).
ORAL INHALATION: Sinusitis, upper respiratory infection (≥3%); dysphonia, epistaxis, respiratory disorder (1% to 3%).
MISC: Systemic absorption may produce reversible hypothalamic pituitary adrenal axis suppression, manifestations of Cushing syndrome, hyperglycemia, and glycosuria.
INTRANASAL: Viral infection (≥5%); chest pain, flu-like symptoms (2% to 5%); anaphylaxis (postmarketing).
ORAL INHALATION: Allergic rhinitis (≥3%); fatigue, flu-like symptoms, accidental injury, infection, pain, postprocedure pain (1% to 3%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider semisupine chair position to control effects of postnasal drainage.
- Anticipate oral candidiasis when steroids are used.

Oral Health Education

- Teach patient to rinse mouth and gargle vigorously with water after inhaled steroid use to minimize the potential for candidiasis.

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montelukast sodium (mahn-teh-LOO-kast SO-dee-uhm)

Singulair

Drug Class: Leukotriene receptor antagonist

PHARMACOLOGY

Action

Blocks the effects of specific leukotrienes in the respiratory airways, thereby reducing bronchoconstriction, edema, and inflammation.

Uses

Prophylaxis and chronic treatment of asthma in patients 12 mo and older; relief of symptoms of seasonal allergic rhinitis in patients 2 yr and older.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Thirst; dental pain (unspecified).
CNS: Dizziness; headache.
GI: Dyspepsia; gastroenteritis; nausea; diarrhea; abdominal pain.
RESP: Bronchitis.
MISC: Asthenia; fatigue; viral infection; influenza; pyuria; fever; leg pain.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse rate, respiratory rate and function); uncontrolled disease characterized by wheezing and coughing.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Ensure that bronchodilator inhaler is present at each dental appointment.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.

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morphine sulfate (MORE-feen SULL-fate)

Astramorph PF, Duramorph, Infumorph, Kadian, MS Contin, MSIR, OMS Concentrate, Oramorph SR, RMS, Roxanol, Roxanol 100, Roxanol Rescudose, Roxanol T, Roxanol UD

M.O.S.-Sulfate, M-Eslon, Morphine HP, ratio-Morphine SR, Statex

Analfin, Duralmor LP, Graten, Kapanol, MST Continus

Drug Class: Narcotic analgesic

PHARMACOLOGY

Action

Relieves pain by stimulating opiate receptors in CNS; also causes respiratory depression, peripheral vasodilation, inhibition of intestinal peristalsis, sphincter of Oddi spasm, stimulation of chemoreceptors that cause vomiting, and increased bladder tone.

Uses

Relief of moderate to severe acute and chronic pain; relief of pain in patients who require opioid analgesics for more than a few days (sustained-release only); management of pain not responsive to nonnarcotic analgesics; dyspnea associated with acute left ventricular failure and pulmonary edema; preoperative sedation; adjunct to anesthesia; analgesia during labor.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Bupivacaine: Possible respiratory depression (mechanism unknown)
- Avoid concurrent use.

Lidocaine: Possible increased CNS and respiratory depression (additive)
- Minimize lidocaine dosage and monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste alteration.
CNS: Lightheadedness; dizziness; drowsiness; sedation; euphoria; dysphoria; delirium; disorientation; incoordination.
CVS: Circulatory depression; shock; hypotension; bradycardia.
GI: Nausea; vomiting; constipation; abdominal pain.
RESP: Respiratory depression; apnea; respiratory arrest; laryngospasm; depression of cough reflex.
MISC: Tolerance; psychological and physical dependence with chronic use; pain at injection site; local irritation and induration after SC use.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Avoid prescribing opioids for dental pain. Acetaminophen is appropriate if GI bleeding is present.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.

Oral Health Education

- Determine need for power toothbrush for self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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moxifloxacin HCl (mox-ih-FLOX-ah-sin HIGH-droe-KLOR-ide)

Avelox, Avelox IV, Vigamox

Drug Class: Antibiotic, fluoroquinolone

PHARMACOLOGY

Action

Interferes with microbial DNA synthesis.

Uses

Treatment of acute bacterial sinusitis, acute bacterial exacerbation of chronic bronchitis, community-acquired pneumonia, uncomplicated skin and skin structure infections, and conjunctivitis caused by susceptible organisms.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Corticosteroids: Possible increased risk of Achilles tendon disorder (mechanism unknown)
- Consider risk/benefit.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, candidiasis, stomatitis, glossitis, taste disorder (<3%).

CNS: Dizziness (3%); headache, insomnia, nervousness, anxiety, confusion, somnolence, tremor, vertigo, paresthesia (<3%); psychotic reaction.

CVS: Syncope.

GI: Nausea (7%); diarrhea (6%); vomiting, abnormal LFT, dyspepsia, constipation, anorexia, flatulence, GI disorder (<3%); pseudomembranous colitis.

RESP: Dyspnea (<3%).

MISC: Abdominal pain, asthenia, moniliasis, pain, malaise, allergic reaction, leg pain, back pain, chest pain (<3%); angioedema (including laryngeal edema), anaphylactic reaction, anaphylactic shock; decreased hemoglobin/hematocrit (>2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.

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mupirocin (myoo-PIHR-oh-sin)

Synonym: pseudomonic acid A

Bactroban, Bactroban Nasal

Mupiban

Drug Class: Anti-infective, topical

PHARMACOLOGY

Action

Inhibits bacterial protein synthesis.

Uses

Treatment of impetigo caused by *Staphylococcus aureus* and *Streptococcus pyogenes* (topical ointment); treatment of secondarily infected traumatic skin lesions (up to 10 cm in length or 100 cm^2 in area) caused by susceptible strains of *Staphylococcus aureus* and *Streptococcus pyogenes* (topical cream); eradication of nasal colonization with methicillin-resistant *Staphylococcus aureus* in adult patients and healthcare workers (nasal).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: TOPICAL: Headache (2%).
NASAL: Headache (9%).

GI: TOPICAL: Nausea (5%) (secondary infected eczema).

RESP: NASAL: Respiratory disorder (5%); cough (2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.

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mycophenolate mofetil/mycophenolic acid (my-koe-FEN-oh-late MOE-feh-till/MY-koe-fen-AHL-ik ASS-id)

Synonym: mycophenolic acid/mycophenolate mofetil

CellCept, Myfortic

CellCept I.V.

Drug Class: Immunosuppressive

PHARMACOLOGY

Action

Inhibits immune-mediated inflammatory responses but exact mechanism not known.

Uses

CELLCEPT: In combination with cyclosporine and corticosteroids for prophylaxis of organ rejection in patients receiving allogeneic renal, cardiac, or hepatic transplants.

MYFORTIC: In combination with cyclosporine and corticosteroids for prophylaxis of organ rejection in patients receiving allogeneic renal transplants.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Candidiasis (11%); gingivitis, gingival hyperplasia, stomatitis, thirst, dry mouth (3% to 10%).

CNS: Headache (54%); insomnia (52%); asthenia (43%); tremor (34%); dizziness (29%); anxiety (28%); paresthesia (21%); depression, convulsion (17%); hypertonia (16%); agitation (13%); somnolence, nervousness (11%); emotional lability, neuropathy, hallucinations, abnormal thinking, vertigo, delirium, hypesthesia, psychosis (3% to <10%).

CVS: Chest pain (26%); hypertension (77%); hypotension (32%); tachycardia or bradycardia, arrhythmia (17% to 20%)

GI: Abdominal pain (63%); nausea (55%); diarrhea (51%); constipation (41%); vomiting (34%); anorexia (25%); dyspepsia (22%); enlarged abdomen (19%); flatulence, cholangitis (14%); hepatitis (13%); cholestatic jaundice (12%); esophagitis, flatulence, gastritis, gastroenteritis, GI hemorrhage, ileus, infection, rectal disorder, GI disorder, dysphagia, GI moniliasis, melena, stomach ulcer (3% to <10%); colitis, pancreatitis.

RESP: Infection, dyspnea (37%); pleural effusion (34%); increased cough (31%); lung disorder (30%); sinusitis (26%); rhinitis (19%); pneumonia (14%); atelectasis (13%); asthma (11%); lung edema, hiccups, pneumothorax, increased sputum, epistaxis, apnea, voice alteration, pain, hemoptysis, neoplasm, respiratory acidosis, bronchitis, respiratory disorder, hyperventilation, respiratory moniliasis (3% to <10%); interstitial lung disorder including fatal pulmonary fibrosis.

MISC: Pain (75%); fever (52%); sepsis, infection (27%); chest pain (26%); ascites (24%); accidental injury (19%); hernia (12%); chills (11%); peritonitis (10%); face edema, cyst, flulike syndrome, malaise, pelvic pain, neck pain, cellulitis (with IV), phlebitis, abnormal healing, abscess, gout (3% to <10%); life-threatening infections (e.g., meningitis, infectious endocarditis), increased frequency of tuberculosis and atypical mycobacterial infection; blood dyscrasias (16% to 42%) (e.g., leukopenia, leukocytosis, thrombocytopenia, anemia).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.

- Consider medical consult to determine disease control and influence on dental treatment.
- Blood dyscrasias reported; anticipate increased bleeding, infection, and poor healing.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

nabumetone (nab-YOU-meh-TONE)

Apo-Nabumetone, Gen-Nabumetone, Rhoxal-nabumetone

Relifex

Drug Class: Analgesic; NSAID

PHARMACOLOGY

Action

Decreases inflammation, pain, and fever, probably through inhibition of COX activity and prostaglandin synthesis.

Uses

Relief of symptoms of chronic and acute rheumatoid arthritis and osteoarthritis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (3%); stomatitis.

CNS: Dizziness; lightheadedness; drowsiness; confusion; increased sweating; vertigo; headaches; nervousness; migraine; anxiety; aggravated Parkinson disease or epilepsy; paresthesia; peripheral neuropathy; myalgia; tremors; fatigue.

GI: Diarrhea; ulceration; heartburn; dyspepsia; nausea; vomiting; anorexia; diarrhea; constipation; flatulence; indigestion; appetite changes; abdominal cramps; epigastric pain; hematemesis; peptic ulcer.

RESP: Bronchospasm; laryngeal edema; dyspnea; hemoptysis; shortness of breath.

MISC: Photosensitivity; leukopenia, thrombocytopenia (<1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Arthritis:* Consider patient comfort and need for semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.

nadolol (nay-DOE-lahl)

Corgard

Apo-Nadol, Novo-Nadolol, ratio-Nadolol

Drug Class: Beta-adrenergic blocker

PHARMACOLOGY

Action

Blocks beta-receptors, which primarily affect cardiovascular system (decreases heart rate, contractility, and BP) and lungs (promotes bronchospasm).

Uses

Management of hypertension and angina pectoris.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)

- Monitor blood pressure.

Sympathomimetic amines: Decreased antihypertensive effect with epinephrine (pharmacological antagonism)

- Monitor blood pressure. Use local anesthetic agents with vasoconstrictor with caution.

Hypertensive reactions with epinephrine (unopposed alpha-adrenergic stimulation)

- Monitor blood pressure. Use local anesthetic agents with vasoconstrictor with caution.

Decreased antianaphylactic effect of epinephrine (beta blockade)

- Increase epinephrine dosage may be required in anaphylaxis.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disturbance; stomatitis.

CNS: Depression; fatigue; lethargy; drowsiness; short-term memory loss; headache; dizziness.

CVS: Bradycardia; arrhythmia; chest pain; hypotension or hypertension; orthostatic hypotension.

GI: Nausea; vomiting; diarrhea.

RESP: Wheezing; bronchospasm; difficulty breathing.

MISC: Increased sensitivity to cold; blood dyscrasias (e.g., thrombocytopenia, leukopenia, agranulocytosis, anemia).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Beta blockers may mask epinephrine-induced signs and symptoms of hypoglycemia in patient with diabetes.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

naloxone HCl (NAL-ox-ohn HIGH-droe-KLOR-ide)

Naloxone HCl: Injection: 0.4 mg/mL, 1 mg/mL; Neonatal injection: 0.02 mg/mL

Narcanti

Drug Class: Narcotic antagonist

PHARMACOLOGY

Action

Evidence suggests that naloxone antagonizes opioid effects by competing for opiate receptor sites in the CNS.

Uses

Complete or partial reversal of opioid depression, including respiratory depression, induced by natural and synthetic opioids, including propoxyphene; diagnosis of suspected or known opioid overdosage; adjunctive agent to increase BP in management of septic shock.

Contraindications

Standard considerations.

Usual Dosage

Opioid overdosage

ADULTS: *IV:* (*IM/SC* if IV route is not available) 0.4 to 2 mg; dose may be repeated at 2- to 3-min intervals if desired degree of counteraction and improvement in respiratory function are not obtained. If no response is observed after administration of 10 mg of naloxone, question the diagnosis.

CHILDREN: *IV:* (*IM/SC* if IV route is not available) Initial dose is 0.01 mg/kg; may give a subsequent dose of 0.1 mg/kg.

Postoperative opioid depression

ADULTS: *IV:* Small doses are usually sufficient. Titrate dose in increments of 0.1 to 0.2 mg IV at 2- to 3-min intervals to the desired degree of reversal (e.g., adequate ventilation without significant pain). Repeat doses may be required at 1- or 2-hr intervals, depending on amount, type, and time interval since last administration of an opiate.

CHILDREN: *IV:* Inject in increments of 0.005 to 0.01 mg at 2- to 3-min intervals to the desired degree of reversal of respiratory depression. Follow recommendation and cautions for adults.

Pharmacokinetics

DIST: Rapidly distributed in the body and readily crosses the placenta. Plasma protein binding is relatively weak.

METAB: Metabolized in the liver primarily by glucuronidation (major metabolite naloxone-3-glucuronide).

EXCRET: In adults the $t_{1/2}$ ranges from 30 to 81 min, while in neonates the $t_{1/2}$ is about 3 hr. Approximately 25% to 40% is excreted as metabolites in the urine within 6 hr, about 50% in 24 hr, and 60% to 70% in 72 hr.

ONSET: Following IV administration, the onset of action is usually apparent within 2 min.

DURATION: Duration of effect is more prolonged after IM injection compared with IV administration.

DRUG INTERACTIONS

Clonidine: Decreased clonidine effect (blockade of clonidine effect)

- Monitor blood pressure and clinical status.

ADVERSE EFFECTS

CVS: Hypotension; hypertension; ventricular tachycardia and fibrillation; pulmonary edema; cardiac arrest; death.

CNS: Agitation; seizures; convulsions; paresthesia; hallucinations; tremulousness.

GI: Nausea; vomiting.
RESP: Dyspnea; respiratory depression; hypoxia.
MISC: Coma; encephalopathy; withdrawal.

CLINICAL IMPLICATIONS

General

When used by DDS:

- *Lactation:* Undetermined.
- *Children:* May be given IV in children to reverse the effects of opiates. IM/SC route for opiate intoxication is not endorsed by the American Academy of Pediatrics because absorption may be erratic or delayed.
- *Elderly:* Use with caution because of the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant diseases or other drug therapy.
- *Renal failure:* Use with caution.
- *Hepatic failure:* Use with caution.
- *Opiate duration:* Because duration of action of some opiates may exceed that of naloxone, keep patients under continuous surveillance.
- *Postoperative:* Abrupt postoperative reversal of opioid depression may result in nausea, vomiting, sweating, tremulousness, tachycardia, increased BP, seizures, ventricular tachycardia and fibrillation, pulmonary edema, and cardiac arrest, which may result in death.
- *Withdrawal:* Use with caution in patients, including neonates of mothers suspected to be physically dependent on opioids, because an acute withdrawal syndrome may be precipitated.
- *Overdosage:* Seizures, severe hypertension, bradycardia, cognitive impairment, behavioral symptoms (including irritability, anxiety, tension, suspiciousness, sadness, difficulty concentrating, lack of appetite), somatic symptoms (including dizziness, heaviness, sweating, nausea, stomachaches).

Pregnancy Risk Category: Category B.

Oral Health Education

When used by DDS:

- Explain name, action, and potential side effects of drug.
- Advise patient or caregiver that medication will be prepared and administered by a health care professional in a medical setting.

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naltrexone HCl (nal-TREX-ohn HIGH-droe-KLOR-ide)

ReVia

Drug Class: Narcotic antagonist

PHARMACOLOGY

Action

Opioid receptor antagonist, markedly attenuating or completely blocking, reversibly, the subjective effects of IV administered opioids.

Uses

Treatment of alcohol dependence; blockade of exogenously administered opioids.

Unlabeled Uses

Eating disorders; postconcussional syndrome unresponsive to other treatments.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Increased thirst (<10%); dry mouth (<1%).
CNS: Headache (7%); dizziness, fatigue (4%); insomnia (3%); anxiety, somnolence (2%); nervousness, low energy (>10%); increased energy, feeling down, irritability, loss of appetite (>10%); depression (0% to 15%); suicidal attempt/ideation (0% to 1%).
GI: Abdominal cramps (>10%); nausea (10%); diarrhea, constipation, vomiting (3%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Avoid prescribing opioids for dental pain. Acetaminophen is appropriate if GI bleeding is present. GI bleeding is associated with alcoholism.
- Determine if patient is in a professional treatment program.
- Alcohol and tobacco use and abuse predisposes to oral squamous cell carcinoma; perform oral cancer examination routinely.
- Do not recommend or prescribe alcohol-containing mouth rinses.

Oral Health Education

- Most substance abusers have poor oral health because of neglect. Encourage daily self-care to prevent periodontal disease.

naproxen (nay-PROX-ehn)

(naproxen sodium)

Aleve: Tablets: 200 mg (220 mg naproxen sodium)
Anaprox: Tablets: 250 mg (275 mg naproxen sodium)
Anaprox DS: Tablets: 500 mg (550 mg naproxen sodium)
EC Naprosyn: Tablets, delayed-release: 375, 500 mg
Naprelan: Tablets, controlled-release: 375 mg (412.5 mg naproxen sodium), 500 mg (550 mg naproxen sodium)
Naprosyn: Tablets: 250, 375, 500 mg; Suspension: 125 mg/5 mL

Apo-Naproxen, Apo-Naproxen SR, Gen-Naproxen EC, Naxen, Novo-Naprox, Novo-Naprox EC, Nu-Naprox, ratio-Naproxen, Apo-Napro-Na, Apo-Napro-Na DS, Novo-Naprox Sodium, Novo-Naprox SR, Novo-Naprox Sodium DS

Artron, Atiflan, Atiquim, Dafloxen, Faraxen, Flanax, Flexen, Flogen, Fuxen, Naprodil, Naxen, Naxil, Neonaxil, Nixal, Novaxen, Pactens, Pronaxil, Supradol, Tandax, Velsay

Drug Class: Analgesic; NSAID

N

PHARMACOLOGY

Action

Decreases inflammation, pain, and fever, probably through inhibition of COX activity and prostaglandin synthesis.

Uses

Rx: Management of mild to moderate pain, symptoms of rheumatoid or osteoarthritis, bursitis, tendinitis, ankylosing spondylitis, primary dysmenorrhea, acute gout. Naproxen (not naproxen sodium) also indicated for treatment of juvenile rheumatoid arthritis. Delayed-release naproxen is not recommended for initial treatment of acute pain because absorption is delayed compared with other naproxen formulations.
OTC: Temporary relief of minor aches and pains associated with the common cold, headache, toothache, muscular aches, backache, minor arthritis pain, pain of menstrual cramps, and reduction of fever.

Unlabeled Uses

Sunburn, migraine, premenstrual syndrome.

Contraindications

Allergy to aspirin, iodides or any NSAID; patients in whom aspirin or other NSAIDs induce symptoms of asthma, rhinitis, or nasal polyps.

Usual Dosage

Pain, dysmenorrhea, bursitis, tendinitis

NAPROXEN

ADULTS: *PO:* 500 mg initially, then 250 mg q 6 to 8 hr. Do not exceed 1,250 mg/day.

NAPROXEN SODIUM

ADULTS: *PO:* 550 mg initially, then 275 mg q 6 to 8 hr. Do not exceed 1,375 mg/day.

CONTROLLED RELEASE

PO: 750 to 1,000 mg once daily. Individualize dosage. Do not exceed 1,500 mg/day.

Pharmacokinetics

ABSORP: Naproxen is completely absorbed from the GI tract. Tablet T_{max} is 2 to 4 hr (immediate-release); suspension T_{max} is 1 to 4 hr; fasted patients' T_{max} is 4 to 6 hr (delayed-release); bioavailability is 95%; steady state is reached in 4 to 5 days.

DIST: Vd is 0.16 L/kg and protein binding is 99% albumin-bound.

METAB: Liver.

EXCRET: Naproxen is eliminated in urine (95%), primarily as naproxen less than 1%, 6-o-desmethylnaproxen less than 1%, or their conjugates (66% to 92%). Naproxen $t_{1/2}$ is 12 to 17 hr; clearance is 0.13 mL/min/kg; $t_{1/2}$ of metabolites and conjugates is less than 12 hr.

SPECIAL POP: *Renal failure:* Metabolites and conjugates may accumulate.

DRUG INTERACTIONS

Alendronate: Increased risk of gastric ulcers (additive)
- Avoid concurrent use.

Angiotensin-converting enzyme inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

Famotidine or ranitidine: Possible decreased naproxen effect (mechanism unknown)
- Monitor clinical status.

Diazepam: Possible decreased onset of action of naproxen (delayed absorption)
- Monitor clinical status.

Cholestyramine: Possible decreased naproxen effect (delayed absorption)
- Monitor clinical status.

Clopidogrel: Increased gastrointestinal bleeding (additive)
- Avoid concurrent use.

Corticosteroids: Increased risk of peptic ulcer disease (additive)
- Avoid concurrent use.

Furosemide: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

Misoprostol: Ataxia (mechanism unknown)
- Monitor clinical status.

Naltrexone: Possible increased risk of hepatotoxicity (mechanism unknown)
- Avoid concurrent use.

Probenecid: Possible naproxen toxicity (decreased renal excretion)
- Avoid concurrent use.

Thiazide diuretics: Hypertensive crisis (decreased diuretic effect)
- Monitor blood pressure.

ADVERSE EFFECTS

CVS: Edema; weight gain; CHF; alterations in BP; vasodilation; palpitations; tachycardia; chest pain; bradycardia.

CNS: Headache; dizziness; drowsiness; vertigo; lightheadedness; mental depression; nervousness; irritability; fatigue; malaise; insomnia; sleep disorders; dream abnormalities; aseptic meningitis.

GI: Constipation; heartburn; abdominal pain; peptic ulceration and bleeding; nausea; dyspepsia; diarrhea; vomiting; anorexia; colitis; flatulence.

RESP: Bronchospasm; laryngeal edema; dyspnea; shortness of breath.

CLINICAL IMPLICATIONS

General

When recommended by DDS:

- *Lactation:* Excreted in breast milk.
- *Children:* Safety and efficacy in children younger than 2 yr not established (Rx); do not give to children younger than 12 yr except under the advice and supervision of an M.D. (OTC).
- *Elderly:* Increased risk of adverse reactions.
- *Renal failure:* Assess function before and during therapy in patients with renal impairment because NSAID metabolites are eliminated renally.
- *Hepatic failure:* May need to reduce dosage in patients with hepatic failure.
- *Cardiovascular disease:* Drug may worsen CHF and may decrease hypertension control.
- *GI effects:* Serious GI toxicity (e.g., bleeding, ulceration, perforation) can occur at any time, with or without warning symptoms.
- *Overdosage:* Drowsiness, nausea, heartburn, vomiting, indigestion, seizures.

When recommended by medical facility:

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- *Arthritis:* Consider patient comfort and need for semisupine chair position.

Pregnancy Risk Category: Category B.

Oral Health Education

When recommended by DDS:

- Tell patient to take with milk, meals, or antacids; follow with 1/2 to 1 glass of water to reduce GI upset.
- Advise patient to shake oral suspension before measuring.
- Explain that it may take 2 to 4 wk with naproxen and 1 to 2 days with naproxen sodium for anti-inflammatory effects to occur. Peak analgesic effect may occur in 1 to 2 hr.
- Caution patient that use with aspirin, alcohol, steroids, and other GI irritants may cause increased GI upset.
- Instruct patient to report the following symptoms to health care provider: visual problems, abdominal pain, symptoms of gastric bleeding.
- Caution patient to avoid consumption of alcoholic beverages and smoking.
- Advise patient to use caution while driving or performing other activities that require coordinated motor movements and mental alertness.

When recommended for arthritis:

- Evaluate manual dexterity; consider need for power toothbrush.

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naratriptan (NAHR-ah-trip-tan)

Amerge

Naramig

Drug Class: Analgesic, migraine

PHARMACOLOGY

Action

Binds to serotonin (5-HT) 1_B and 1_D receptors in intracranial arteries leading to vasoconstriction and subsequent relief of migraine headache.

Uses

Treatment of acute migraine attacks with or without aura.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (1%).

CNS: Dizziness, drowsiness, malaise/fatigue, paresthesia (2%); vertigo (≥1%); cerebral vascular accident, including transient ischemic attack, subarachnoid hemorrhage, and cerebral infarction.

GI: Nausea (5%); vomiting (≥1%); colonic ischemia (postmarketing).

RESP: Dyspnea.

MISC: Atypical sensation (4%); pain and pressure in neck and throat (2%); warm/cold temperature sensation, sensations of pressure, tightness, and heaviness (≥1%); photosensitivity.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP and pulse). Drugs for prevention are sympatholytic; drugs for treatment of acute attack are sympathomimetic.
- If GI side effects occur, consider semisupine chair position.
- This drug is for acute use during migraine attack. Patient is unlikely to present for oral health care appointment.

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narcotic analgesic combinations

Narcotic analgesics

Codeine, hydrocodone bitartrate, dihydrocodeine bitartrate, opium, oxycodone HCl, oxycodone terephthalate, meperidine HCl, propoxyphene HCl, propoxyphene napsylate, tramadol.

Barbiturates, acetylcarbromal, carbromal, and bromisovalum

Barbiturates, acetylcarbromal, carbromal, and bromisovalum are used for their sedative effects.

Alor 5/500, Lortab ASA Tablets: 1 or 2 tablets q 4 to 6 hr up to 8 tablets daily: 5 mg hydrocodone bitartrate, 500 mg aspirin

Lortab Elixir: 15 mL q 4 to 6 hr: 2.5 hydrocodone bitartrate, 167 mg acetaminophen per 5 mL. 7% alcohol, saccharin, sorbitol, sucrose, parabens

Synalgos-DC: 2 capsules q 4 hr: 16 mg dihydrocodeine bitartrate, 356.4 mg aspirin, 30 mg caffeine

Percodan-Demi Tablets: 1 or 2 tablets q 6 hr: 2.25 mg oxycodone HCl and 0.19 mg oxycodone terephthalate, 325 mg aspirin

Percodan Tablets, Roxiprin Tablets: 1 tablets q 6 hr: 4.5 mg oxycodone HCl and 0.38 mg oxycodone terephthalate, 325 mg aspirin

Darvon Compound-65 Pulvules: 1 tablet q 4 hr: 65 mg propoxyphene, 389 mg aspirin, 32.4 mg caffeine

B & O Supprettes No. 15A Suppositories: 1 or 2 suppositories daily: 30 mg powdered opium, 16.2 mg powdered belladonna extract, polyethylene glycol base

B & O Supprettes No. 16A Suppositories: 1 or 2 suppositories daily: 60 mg powdered opium, 16.2 mg powdered belladonna extract, polyethylene glycol base

ADVERSE EFFECTS

Refer to monographs for each component included in combination for complete adverse effect profile. High-dose combination products are more likely to experience adverse drug effects.

⚠ **ORAL:** Dry mouth.

GI: Nausea; vomiting.

RESP: Depression of respiration.

CNS: Sedation; dizziness.

CVS: Hypotension.

nateglinide (nah-TEG-lih-nide)

Starlix

Drug Class: Antidiabetic, Meglitinide

PHARMACOLOGY

Action

Lowers blood glucose levels by stimulating insulin secretion from the pancreas.

Uses

As monotherapy to lower blood glucose in patients with type 2 diabetes mellitus whose hyperglycemia cannot be adequately controlled by diet and exercise and who have not been treated long-term with other antidiabetic agents; in combination with metformin or a thiazolidinedione, in patients whose hyperglycemia is inadequately controlled with metformin, or after a therapeutic response to a thiazolidinedione. Do not use as a substitute for those drugs.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Dizziness (4%).
GI: Diarrhea (3%).
RESP: URI (11%); bronchitis (3%); coughing (2%).
MISC: Back pain, flu-like symptoms (4%); arthropathy, accidental trauma (3%); hypoglycemia (2.4%).

CLINICAL IMPLICATIONS

General

- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated.
- Monitor blood pressure because hypertension and dyslipidemia (CAD) are prevalent in diabetes mellitus.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin or Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical dental procedures.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Observe for signs of hypoglycemia (e.g., confusion, argumentativeness, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- Ensure patient has taken medication and eaten meal.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- Medical consult advised if fasting blood glucose is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- *If insulin is used:* Consider time of peak hypoglycemic effect.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.

nedocromil sodium (NEH-doe-KROE-mill SO-dee-uhm)

Alocril, Tilade

Drug Class: Respiratory inhalant

PHARMACOLOGY

Action

Inhibits release of mediators from inflammatory cell types associated with asthma, including histamine from mast cells and beta glucuronidase from macrophages. May also suppress local production of leukotrienes and prostaglandins. Inhibits development of bronchoconstriction responses to inhaled antigen and other challenges such as cold air.

Uses

Maintenance of mild to moderate bronchial asthma; treatment of itching caused by allergic conjunctivitis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Taste disturbance.

CNS: Headache.

GI: Nausea; vomiting; dyspepsia; abdominal pain.

RESP: Rhinitis; URI; asthma.

MISC: Infection (8%); flu-like syndrome (3%); chills, fever (2%); neck rigidity (1%); anaphylactic reactions, angioedema, serotonin syndrome, photophobia, photosensitization (1%); leukopenia, ecchymosis, anemia (0.1% to 1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse rate, respiratory rate and function); uncontrolled disease characterized by wheezing and coughing.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Inhalants can dry oral mucosa; anticipate candidiasis, increased calculus, plaque levels, and caries.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Ensure that bronchodilator inhaler is present at each dental appointment.

nefazodone HCl (neff-AZE-oh-dohn HIGH-droe-KLOR-ide)

Apo-Nefazodone, Lin-Nefazodone, Serzone-5HT2

Drug Class: Antidepressant

PHARMACOLOGY

Action

Undetermined; inhibits neuronal uptake of serotonin and norepinephrine; antagonizes alpha$_1$-adrenergic receptors.

Uses

Treatment of depression.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Alprazolam or triazolam: Possible alprazolam or triazolam toxicity (decreased metabolism)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (25%); taste disturbance; thirst.

CNS: Headache (36%); somnolence (28%); dizziness (22%); asthenia, insomnia (11%); lightheadedness (10%); confusion (8%); memory impairment, paresthesia (4%); abnormal dreams, decreased concentration (3%); ataxia, incoordination, psychomotor retardation, tremor (2%); hypertonia, decreased libido (1%); convulsions.

CVS: Postural hypotension (4%), hypotension (2%).

GI: Nausea (23%); constipation (17%); dyspepsia (9%); diarrhea (8%); increased appetite (5%); nausea and vomiting (2%); gastroenteritis (≥1%).

RESP: Increased cough (3%); dyspnea, bronchitis (≥1%).

MISC: Infection (8%); flu-like syndrome (3%); chills, fever (2%); neck rigidity (1%); anaphylactic reactions, angioedema, serotonin syndrome; photophobia, photosensitization (1%); leukopenia, ecchymosis, anemia (0.1% to 1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.
- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

nelfinavir mesylate (nell-FIN-ah-veer MES-il-ayt)

Viracept

Drug Class: Antiretroviral, protease inhibitor

PHARMACOLOGY

Action

Inhibits HIV protease, the enzyme required to form functional proteins in HIV-infected cells.

Uses

Treatment of HIV infection in combination with other antiretroviral agents.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Midazolam or triazolam: Possible midazolam or triazolam toxicity (decreased metabolism)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Mouth ulcerations (unspecified).

CNS: Headache; paresthesia; dizziness; insomnia; somnolence; anxiety; depression; seizures; emotional lability; hyperkinesia; migraine; sleep disorder.

CVS: Torsades de pointes, prolonged QT interval.
GI: Anorexia; diarrhea (20%); dyspepsia; flatulence; nausea (3%); vomiting; abdominal pain; pancreatitis; bleeding.
RESP: Dyspnea.
MISC: Asthenia; fever; myalgia; back pain; malaise; arthralgia; myasthenia; myopathy; accidental injury; allergic reaction; arthralgia; cramps; anemia, leukopenia, thrombocytopenia (<2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values improve.
- Anticipate oral candidiasis when HIV disease is reported.
- Monitor vital signs.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care since HIV infection reduces host resistance.

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nevirapine (nuh-VEER-uh-peen)

Viramune

Drug Class: Antiretroviral, non-nucleoside reverse transcriptase inhibitor

PHARMACOLOGY

Action

Inhibits replication of retroviruses, including HIV.

Uses

In combination with other antiretroviral agents for treatment of HIV-1 infection.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Ulcerative stomatitis; oral lesions (unspecified).
CNS: Fatigue (5%); headache (4%); somnolence; paresthesia; malaise.
GI: Nausea (9%); abdominal pain, diarrhea (2%); vomiting.
MISC: Fever; eosinophilia; granulocytopenia; thrombocytopenia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- Anticipate oral candidiasis when HIV disease is reported.
- Advise products for palliative relief of oral manifestations (e.g., stomatitis, mucositis, xerostomia).
- If GI side effects occur, consider semisupine chair position.

- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care since HIV infection reduces host resistance.

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niacin (NYE-uh-sin)

Synonyms: B3; nicotinic acid

Niaspan, Slo-Niacin

Hipocol, Pepevit

Drug Class: Vitamin; Antihyperlipidemic

PHARMACOLOGY

Action

Necessary for lipid metabolism, tissue respiration, and glycogenolysis. At pharmacological doses, it reduces total cholesterol, LDL cholesterol, and triglycerides while increasing HDL cholesterol. Also causes peripheral vasodilation, especially cutaneous vessels.

Uses

Prevention and treatment of niacin deficiency or pellagra; treatment of hyperlipidemia (types IV and V); adjunct to diet for the reduction of elevated total and LDL levels in patients with primary hypercholesterolemia when the response to diet and other nonpharmacologic measures alone has been inadequate.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Dizziness; syncope; headache.
CVS: Postural hypotension; atrial fibrillation and other cardiac arrhythmias.
GI: Nausea; bloating; flatulence; hunger; vomiting; heartburn; diarrhea; activation of peptic ulcer; abdominal pain; dyspepsia.
MISC: Hyperuricemia; hyperglycemia; decreased glucose tolerance test results; toxic amblyopia; sensation of warmth; cystoid macular edema.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- High LDL cholesterol concentration is the major cause of atherosclerosis, which leads to CAD (angina, MI); determine degree of CV health and ability to withstand stress of dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

niacin/lovastatin (NYE-uh-sin/LOW-vuh-STAT-in)

Synonym: lovastatin/niacin

Drug Class: Antihyperlipidemic combination

PHARMACOLOGY

Action

NIACIN: Necessary for lipid metabolism, tissue respiration, and glycogenolysis; reduces total cholesterol, LDL cholesterol, and triglycerides (TG) while increasing HDL cholesterol.
LOVASTATIN: Increases rate at which body removes cholesterol from blood and reduces production of cholesterol in the body by inhibiting enzyme that catalyses early rate-limiting step in cholesterol synthesis; increases HDL; reduces LDL, VLDL, and TG.

Uses

Treatment of primary hypercholesterolemia (heterozygous familial and nonfamilial) and mixed dyslipidemia (Frederickson Types IIa and IIb) in patients treated with lovastatin who require further TG-lowering or HDL-raising who may benefit from having niacin added to their regimen; patients treated with niacin who require further LDL-lowering who may benefit from having lovastatin added to their regimen.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole, ketoconazole, or itraconazole: Rhabdomyolysis (decreased lovastatin metabolism)

- Avoid concurrent use.

Clarithromycin: Rhabdomyolysis (decreased lovastatin metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

The incidence stated for the following adverse reactions were reported with Advicor (niacin/lovastatin) administration. Adverse reactions occurring with administration of either niacin or lovastatin listed in their respective monographs.

⚠ **ORAL:** Dry mouth, taste disturbance.

CNS: Headache (9%); asthenia (5%).

CVS: Flushing, postural hypotension.

GI: Nausea (7%); diarrhea (6%); abdominal pain (4%); dyspepsia, vomiting (3%).

MISC: Infection (20%); pain (8%); flu-like syndrome (6%); blood dyscrasias, including thrombocytopenia, leukopenia, others.

CLINICAL IMPLICATIONS

General

- High LDL cholesterol concentration is the major cause of atherosclerosis, which leads to CAD (e.g., angina, MI); determine degree of CV health and ability to withstand stress of dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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nicardipine HCl (NYE-CAR-dih-peen HIGH-droe-KLOR-ide)

Cardene, Cardene I.V., Cardene SR

Ridene

Drug Class: Calcium channel blocker

PHARMACOLOGY

Action

Inhibits movement of calcium ions across cell membrane in systemic and coronary vascular smooth muscle and myocardium.

Uses

Treatment of chronic stable (effort-associated) angina (immediate-release capsules); management of hypertension (immediate- and sustained-release capsules; IV when oral therapy not feasible or desirable).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; gingival hyperplasia.

CNS: Dizziness; lightheadedness; asthenia; psychiatric disturbances; headache; paresthesia; somnolence; weakness.

CVS: Flushing (9.7%); palpitations (4%), postural hypotension (1%), tachycardia (3%).

GI: Nausea; abdominal discomfort; cramps; dyspepsia.

MISC: Flushing; allergic reaction; myalgia; hypokalemia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Angina:* Ensure patient brings personal acute-use nitroglycerin prescription to all dental appointments; verify expiration date to ensure drug activity.
- Anticipate gingival hyperplasia; consider MD consult to recommend different drug regimen if periodontal health is compromised.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.

nicotine (NIK-oh-TEEN)

Commit, Habitrol, NicoDerm, Nicorette, Nicorette DS, Nicotrol, Nicotrol Inhaler, Nicotrol NS, ProStep

Nicorette Plus

Nicolan, Nicotinell TTS

Drug Class: Smoking deterrent

PHARMACOLOGY

Action

Reduces nicotine withdrawal symptoms by providing nicotine levels lower than those associated with smoking.

Uses

Aid to smoking cessation. Part of comprehensive behavioral smoking-cessation program.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Local irritation (mouth, throat); taste disturbance, pain in jaw; gum disorder, tooth disorder (unspecified) (≥3%); excess salivation.

CNS: Insomnia; dizziness; lightheadedness; irritability; headache; impaired concentration; confusion; convulsions; depression; paresthesia; abnormal dreams.

CVS: Hypertension (≥3%).

GI: GI distress; belching; indigestion; nausea; vomiting; hiccups; anorexia; constipation; diarrhea.

RESP: Increased cough; pharyngitis; sinusitis; difficulty breathing; hoarseness; sneezing.

MISC: Pain; myalgia; arthralgia; dysmenorrhea.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Perform oral cancer examination because of increased risk with tobacco use.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Inform patient about the risks of using tobacco products and the relationship between tobacco use and oral cancer.
- Explain role of tobacco use in periodontal disease and the need to consider a smoking cessation program.
- Encourage daily plaque control procedures for effective self-care.

nifedipine (nye-FED-ih-peen)

Adalat, Adalat CC, Afeditab CR, Nifedical XL, Procardia, Procardia XL

Adalat XL, Apo-Nifed, Apo-Nifed PA, Novo-Nifedin, Nu-Nifed, Nu-Nifedipine

Corogal, Corotrend, Nifedipres, Noviken-N

Drug Class: Calcium channel blocker

PHARMACOLOGY

Action

Inhibits movement of calcium ions across cell membrane in systemic and coronary vascular smooth muscle and myocardium. Increases carbon monoxide and decreases peripheral vascular resistance. Minimal effect on sinuatrial and AV nodal conduction. Reduces myocardial oxygen demand; relaxes and prevents coronary artery spasm.

Uses

Treatment of vasospastic (Prinzmetal or variant) angina; chronic stable angina; hypertension (sustained-release tablets only).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Gingival hyperplasia; dry mouth; thirst.

CNS: Dizziness; lightheadedness; giddiness; nervousness; headache; sleep disturbances; insomnia; abnormal dreams; blurred vision; equilibrium disturbances; weakness; jitteriness; paresthesia; somnolence; malaise; anxiety.

CVS: Flushing (25%); edema (30%); palpitations (7%).

GI: Nausea (11%); diarrhea; constipation; abdominal discomfort; cramps; dyspepsia; flatulence.

RESP: Nasal or chest congestion; shortness of breath; wheezing; cough; respiratory infection.

MISC: Flushing; sweating; muscle cramps, pain and inflammation; joint stiffness, pain, or arthritis; chills; fever.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Angina:* Ensure patient brings personal acute-use nitroglycerin prescription to all dental appointments; verify expiration date to ensure drug activity.
- Anticipate gingival hyperplasia; consider MD consult to recommend different drug regimen if periodontal health is compromised.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.

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nisoldipine (nye-SOLD-ih-peen)

Sular

Syscor

Drug Class: Calcium channel blocker

PHARMACOLOGY

Action

Inhibits movement of calcium ions across cell membrane in systemic and coronary vascular smooth muscle and myocardium.

Uses

Treatment of hypertension, alone or in combination with other antihypertensive agents.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole: Possible increased nisoldipine toxicity (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Gingival hyperplasia

CNS: Headache; dizziness.

CVS: Chest pains, peripheral edema (7% to 29%); palpitations; vasodilation.

GI: Nausea.

RESP: Pharyngitis, rhinitis.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Anticipate gingival hyperplasia; consider MD consult to recommend different drug regimen if periodontal health is compromised.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.

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nitrofurantoin (nye-troe-FYOOR-an-toyn)

Furadantin, Macrobid, Macrodantin

Apo-Nitrofurantoin, Novo-Furantoin

Furadantina, Macrodantina

Drug Class: Anti-infective, urinary

PHARMACOLOGY

Action

May interfere with bacterial cell wall formation and bacterial duplication. Inhibits bacterial carbohydrate metabolism. Bacteriostatic in low concentrations; bactericidal at higher concentrations.

Uses

Treatment of urinary tract infections caused by susceptible strains of *Escherichia coli*, enterococci, *Staphylococcus aureus*, certain strains of *Klebsiella*, *Enterobacter*, and *Proteus* species.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Sialadenitis.

CNS: Peripheral neuropathy; headache; dizziness; nystagmus; drowsiness.

GI: Anorexia; nausea; emesis; abdominal pain; diarrhea; parotiditis; pancreatitis.

RESP: Acute, subacute or chronic pulmonary reaction (e.g., shortness of breath, chest pain, cough, fever, chills); permanent pulmonary impairment.

MISC: Anaphylaxis; asthmatic attack in patient with history of asthma; drug fever; arthralgia; photosensitivity; muscular aches; blood dyscrasias (e.g., agranulocytosis, anemia, leukopenia, thrombocytopenia).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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nitroglycerin (nye-troe-GLIH-suh-rin)

Minitran: Transdermal systems: 9, 18, 36, 54 mg
Nitrek: Transdermal systems: 22.4, 44.8, 67.2 mg
Nitro-Bid: Ointment, topical: 2% in a lanolin-petrolatum base
Nitro-Bid IV: Injection, IV: 5 mg/mL
Nitro-Dur: Transdermal systems: 20, 40, 60, 80, 100, 120, 160 mg
Nitro-Time: Capsules, sustained-release: 2.5, 6.5, 9 mg
Nitrodisc: Transdermal systems: 16, 24, 32 mg
Nitrogard: Tablets, buccal, controlled-release (transmucosal): 2, 3 mg
Nitrol: Ointment, topical: 2% in a lanolin-petrolatum base
Nitrolingual: Aerosol spray, translingual: 0.4 mg/metered dose
NitroQuick, Nitrostat: Tablets, sublingual: 0.3, 0.4, 0.6 mg
Transderm-Nitro: Transdermal systems: 12.5, 25, 50, 75 mg

Gen-Nitro, Nitrolingual Pumpspray

Anglix, Cardinit, Nitradisc, Nitroderm TTS

Drug Class: Antianginal

PHARMACOLOGY

Action

Relaxation of smooth muscle of venous and arterial vasculature.

Uses

Treatment of acute angina (SL, translingual, IV, transmucosal); prophylaxis of angina (SL, transmucosal, translingual, sustained release, transdermal, topical); control of BP in perioperative or intraoperative hypertension (IV); CHF associated with MI (IV).

Unlabeled Uses

Reduce cardiac workload in patients with MI and in refractory CHF (SL, topical, oral, IV); adjunctive treatment of Raynaud disease (topical); treatment of hypertensive crisis (IV).

Contraindications

Hypersensitivity to nitrates; severe anemia; closed-angle glaucoma; orthostatic hypotension; early MI; pericarditis or pericardial tamponade; head trauma or cerebral hemorrhage; allergy to adhesives (transdermal); hypotension or uncorrected hypovolemia (IV); increased intracranial pressure or decreased cerebral perfusion (IV).

Usual Dosage

Angina

ADULTS: *SL:* 0.15 to 0.6 mg dissolved under tongue or in buccal pouch at first sign of acute angina attack; repeat q 5 min (do not exceed 3 tablets in 15 min).
Translingual: 1 to 2 sprays onto or under tongue at first onset of attack.
Transmucosal: 1 mg q 3 to 5 hr during waking hours; tablet placed between lip or cheek and gum.

Pharmacokinetics

ABSORP: Rapid.
DIST: Vd: 3 L/kg. Plasma protein binding is approximately 60% (parent); 1,2 dinitroglycerin 60%; 1,3 dinitroglycerin 30%.
METAB: Extensive in liver by nitrate reductase; known sites of extrahepatic metabolism include red blood cells and vascular walls. Metabolized to inorganic nitrate and the active 1,2 and 1,3 dinitroglycerols, which are less effective vasodilators but have longer plasma half-lives than parent compound.
EXCRET: Eliminated by urine as inactive metabolites. Serum $t_{1/2}$ is 3 min (IV) and 1 to 4 min (SL). Clearance is 1 L/kg/min.
ONSET: 1 to 2 min (IV) and 1 to 3 min (SL).
DURATION: 3 to 5 min (IV), 30 to 60 min (SL), and 3 to 5 hr (buccal).

DRUG INTERACTIONS

Diazoxide: Severe hypotension (additive)
- Monitor clinical status.

Diltiazem: Hypotension (additive)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** SL TABLETS: Burning, tingling sensation; tooth disorder (unspecified).
CVS: Tachycardia; palpitations; hypotension; syncope; arrhythmias.
CNS: Headache; apprehension; weakness; vertigo; dizziness; agitation; insomnia.
GI: Nausea; vomiting; diarrhea; dyspepsia.
RESP: Bronchitis; pneumonia.
MISC: Arthralgia; perspiration; pallor; cold sweat; edema.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Angina:* Ensure patient brings personal acute-use nitroglycerin prescription to all dental appointments; verify expiration date to ensure drug activity.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If used to relieve acute anginal attack, ensure patient is sitting down.

When used by DDS:
- *Angina:* May aggravate angina caused by hypertrophic cardiomyopathy.
- *Defibrillation:* Do not discharge cardioverter/defibrillator through paddle electrode.
- *MI:* Safety of oral or sublingual products in acute MI not established; use only with close observation and monitoring. However, IV nitroglycerin is drug of choice in acute MI.
- *Orthostatic hypotension:* May occur even with small doses; alcohol accentuates this reaction.
- *Sublingual administration:* Absorption is dependent on salivary secretion; dry mouth decreases absorption.
- *Overdosage:* Hypotension, tachycardia, flushing, excessive sweating, headache, vertigo, palpitations, visual disturbances, nausea, vomiting, confusion, and dyspnea may occur as a result of vasodilation and methemoglobinemia.

Pregnancy Risk Category: Category C.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care in patients at risk for cardiovascular disease.

When used by DDS:
- Review with patient and family the following signs of angina: pressure-like chest pain of acute onset, often associated with physical activity, which may radiate down to left arm or up to neck and jaw.

Sublingual
- Advise patient to dissolve tablet under tongue and not to swallow. If pain remains, the dose may be repeated q 5 min until 3 tablets are taken. If pain still persists or becomes more intense, patient should be taught to call 911 or appropriate local number to obtain emergency services.
- Tell patient to place tablet between gum and cheek if stinging sensation occurs.
- Caution patient to sit or lie down while taking and for 20 min after initial dose. If dizziness occurs, instruct patient to lie down.
- Teach patient storage instructions (per Administration/Storage information).
- Advise patient to discard 6 mo after opening package.
- Instruct patient to report these symptoms to health care provider: severe headache, blurred vision, dry mouth, dizziness, or flushing.

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nizatidine (nye-ZAT-ih-deen)

Axid AR, Axid Pulvules

Apo-Nizatidine, Novo-Nizatidine, PMS-Nizatidine

Drug Class: Histamine H_2 antagonist

PHARMACOLOGY

Action
Reversibly and competitively blocks histamine at H_2-receptors, particularly those in gastric parietal cells, leading to inhibition of gastric acid secretion.

Uses
Treatment and maintenance of duodenal ulcer, GERD (including erosive or ulcerative disease), and benign gastric ulcer. Prevention of heartburn, acid indigestion, and sour stomach brought on by consuming irritating food and beverages.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
CNS: Headache; somnolence; fatigue; dizziness.

GI: Diarrhea; constipation; nausea; vomiting; abdominal discomfort; anorexia; cholestatic or hepatocellular effects.

MISC: Gynecomastia; sweating; fever; eosinophilia, thrombocytopenia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If patient has GI disease, consider semisupine chair position.
- Use COX inhibitors with caution; they may exacerbate PUD and GERD.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding.
- Anticipate chemical erosion of teeth.
- Substernal pain (heartburn) may mimic pain of cardiac origin.
- Drugs that lower acidity in intestinal tract may interfere with absorption of some antibiotics (penicillin, tetracyclines).

Oral Health Education

- *GERD:* Inform patient that toothbrushing should not be done after reflux, but to only rinse mouth with water, then use home fluoride product to minimize chemical erosion caries.

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norethindrone acetate (nor-eth-IN-drone ASS-uh-TATE)

Aygestin

Norlutate

Syngestal

Drug Class: Progestin

PHARMACOLOGY

Action

Inhibits secretion of pituitary gonadotropins, thereby preventing follicular maturation and ovulation.

Uses

Treatment of secondary amenorrhea; endometriosis; abnormal uterine bleeding caused by hormonal imbalance in the absence of organic pathology (e.g., uterine cancer).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CVS: Thrombophlebitis; cerebral thrombosis and embolism; hypertension; edema.
CNS: Depression; changes in libido; changes in appetite; headache; nervousness; dizziness; fatigue.
RESP: Pulmonary embolism.
MISC: Premenstrual syndrome; backache.

CLINICAL IMPLICATIONS

General

- Monitor vital signs.

Oral Health Education

- Caution patient who reports cigarette smoking of increased risk of blood clot formation.

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norfloxacin (nor-FLOX-uh-SIN)

Chibroxin, Noroxin

Apo-Norflox, Novo-Norfloxacin

Difoxacil, Floxacin, Oranor

Drug Class: Antibiotic, fluoroquinolone

PHARMACOLOGY

Action

Interferes with microbial DNA synthesis.

Uses

Oral treatment of urinary tract infections caused by susceptible organisms; treatment of sexually transmitted diseases caused by *Neisseria gonorrhoeae*; ocular solution for treatment of superficial ocular infections from strains of susceptible organisms; prostatitis caused by *Escherichia coli*.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Corticosteroids: Possible increased risk of Achilles tendon disorder (mechanism unknown)

- Consider risk/benefit.

ADVERSE EFFECTS

⚠ **ORAL:** Dry, painful mouth (1%).

CNS: Headache; dizziness; fatigue; drowsiness.

MISC: Eosinophilia, leukopenia, neutropenia, increase or decrease in platelets (1% to 1.5%).

GI: Diarrhea; nausea; vomiting; abdominal pain/discomfort.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If GI side effects occur, consider semisupine chair position.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

N

nortriptyline HCl (nor-TRIP-tih-leen HIGH-droe-KLOR-ide)

Aventyl HCl, Aventyl HCl Pulvules, Pamelor

Apo-Nortriptyline, Gen-Nortriptyline, Novo-Nortriptyline, Nu-Nortriptyline, PMS-Nortriptyline, ratio-Nortriptyline

Drug Class: Tricyclic antidepressant

PHARMACOLOGY

Action

Inhibits reuptake of norepinephrine and serotonin in CNS.

Uses

Relief of symptoms of depression.

Unlabeled Uses

Treatment of panic disorder; premenstrual depression; dermatologic disorders (e.g., chronic urticaria, angioedema, nocturnal pruritus in atopic eczema).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole: Possible nortriptyline toxicity (decreased metabolism)

- Monitor clinical status.

Tramadol: Increased risk of seizure (additive)
- Avoid concurrent use.

Sympathomimetic amines: Hypertension and hypertensive crisis (additive)
- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; gingivitis; ulcerative stomatitis; taste disturbance.

CNS: Confusion; hallucinations; delusions; nervousness; restlessness; agitation; panic; insomnia; nightmares; mania; exacerbation of psychosis; drowsiness; dizziness; weakness; fatigue; emotional lability; seizures; tremors; extrapyramidal symptoms (e.g., pseudoparkinsonism, movement disorders, akathisia).

CVS: Arrhythmias; hypertension or hypotension; orthostatic hypotension; palpitations; tachycardia.

GI: Nausea; vomiting; anorexia; GI distress; diarrhea; flatulence; constipation.

RESP: Pharyngitis; rhinitis; sinusitis; laryngitis; coughing.

MISC: Numbness; breast enlargement; bone marrow depression, including agranulocytosis, aplastic anemia, eosinophilia, leukopenia, thrombocytopenia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.
- Determine need for power toothbrush for self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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nystatin (nye-STAT-in)

Mycostatin: Vaginal tablets: 100,000 units; Ointment: 100,000 units/g; Powder: 100,000 units/g
Mycostatin Pastilles: Troches/pastilles: 200,000 units
Nilstat: Oral suspension: 100,000 units; Bulk powder: 150 million units, 1 billion units, 2 billion units; Cream: 100,000 units; Ointment: 100,000 units
Pedi-Dri: Powder: 100,000 units/g

Candistatin, Nyaderm, PMS-Nystatin, ratio-Nystatin

Micostatin, Nistaquim

Drug Class: Anti-infective; Antifungal

PHARMACOLOGY

Action

Binds to fungal cell membrane, changing membrane permeability and allowing leakage of intracellular components.

Uses

Treatment of intestinal, oral, vulvovaginal, cutaneous, or mucocutaneous candidiasis.

Contraindications

Standard considerations.

Usual Dosage

Oral or mucocutaneous candidiasis

ADULTS AND CHILDREN: *PO:* (suspension) 200,000 to 600,000 units qid; swish and swallow, or (oral pastilles) 1 to 2 pastilles (200,000 to 400,000 units) dissolved in mouth 4 to 5 times/day.

INFANTS *PO:* 200,000 units qid.

DRUG INTERACTIONS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

GI: Diarrhea; GI distress; nausea; vomiting (with large oral doses).

CLINICAL IMPLICATIONS

General

When prescribed by DDS:

- *Lactation:* Undetermined.
- *Effectiveness:* Has no activity against bacteria or trichomonads. Not indicated for systemic mycoses.
- *Overdosage:* Nausea, diarrhea, vomiting.

When prescribed by medical facilities:

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If GI side effects occur, consider semisupine chair position.

Pregnancy Risk Category: Category C (oral).

Oral Health Education

When prescribed by DDS:

- Instruct patient that long-term therapy may be needed to clear infection and that patient should complete entire course of medication. Take drug for 2 days after symptoms have disappeared or as directed.
- Advise patient to notify health care provider if irritation occurs.
- Assure patient that relief from itching may occur after 24 to 72 hr.
- Instruct patient to carefully wash hands before and after each application of topical medication.
- Advise patient with oral candidiasis not to use mouthwash, which may alter normal flora and promote infections.

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ofloxacin (oh-FLOX-uh-SIN)

Floxin, Ocuflox

Apo-Oflox

Drug Class: Antibiotic, fluoroquinolone

PHARMACOLOGY

Action

Interferes with microbial DNA synthesis.

Uses

Treatment of acute bacterial exacerbations of chronic bronchitis, community acquired pneumonia, uncomplicated skin and skin structure infections, acute uncomplicated urethral and cervical gonorrhea, nongonococcal urethritis, cervicitis, acute pelvic inflammatory disease, uncomplicated cystitis, complicated UTI, prostatitis caused by *Escherichia coli*.
OPHTHALMIC: Treatment of conjunctivitis and corneal ulcer infections caused by susceptible organisms.
OTIC: Treatment of otitis externa and chronic suppurative otitis media in patients with perforated tympanic membranes; treatment of acute otitis media in pediatric patients with tympanostomy tubes.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Corticosteroids: Possible increased risk of Achilles tendon disorder (mechanism unknown)
- Consider risk-benefit.

ADVERSE EFFECTS

⚠ **ORAL:** Painful or dry mouth, dysgeusia; taste disturbance (7%, otic).

CNS: Dizziness, vertigo (1%, otic); headache; dizziness; fatigue; lethargy; drowsiness; insomnia; nervousness.

CVS: Chest pain (3%).

GI: Diarrhea; nausea; vomiting; abdominal pain or discomfort; flatulence.

MISC: Application site reaction (3%), paresthesia (otic); vaginitis; fever; decreased appetite; photosensitivity; blood dyscrasias (leukopenia, eosinophilia, neutropenia, anemia). Ophthalmic use may possibly cause same adverse reactions seen with systemic use because of absorption.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If GI side effects occur, consider semisupine chair position.
- If an oral infection requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.
- Blood dyscrasias are rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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olanzapine (oh-LAN-zah-peen)

Zyprexa, Zyprexa Intramuscular, Zyprexa Zydis

Drug Class: Atypical antipsychotic

PHARMACOLOGY

Action

Unknown. May control psychotic symptoms through antagonism of selected dopamine and serotonin receptors in the CNS.

Uses

Treatment of schizophrenia (oral); short-term treatment of acute mixed or manic episodes with bipolar I disorder (oral); in combination with lithium or valproate for short-term treatment of acute episodes associated with bipolar I disorder (oral); agitation associated with schizophrenia and bipolar I mania (IM).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Diazepam: Increased orthostatic hypotension (mechanism unknown)
- Avoid concurrent use.

Tramadol: Possible increased risk of serotonin syndrome (mechanism unknown)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (22%); increased salivation and thirst, dental caries (1%).

CNS: Somnolence (35%); dizziness (18%); parkinsonism (14%); insomnia (12%); personality disorder (8%); tremor, abnormal gait, increased appetite (6%); akathisia (5%); hypertonia, dystonia (3%); articulation impairment (2%); abnormal dreams, emotional lability, euphoria, decreased libido, paresthesia, schizophrenic reaction (≥1%).

CVS: Hypotension (3% to 5%); tachycardia, chest pain (3%); hypertension (2%).

GI: Constipation, dyspepsia (11%); nausea (9%); increased appetite (6%); vomiting (4%).

RESP: Increased cough, rhinitis (6%); pharyngitis (4%); dyspnea (≥1%).

MISC: Asthenia (15%); accidental injury (12%); fever (6%); back pain, extremity pain, joint pain (5%); flu-like syndrome, suicide attempt, intentional injury, joint stiffness and twitching (≥1%); allergic reactions (e.g., anaphylactoid reaction, angioedema, pruritus, urticaria), pancreatitis, rhabdomyolysis; ecchymosis; leukopenia (>1%); thrombocytopenia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Monitor vital signs (e.g., BP, pulse, respiration).
- *Postural hypotension*: Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present consult with MD to consider medication changes.
- If GI side effects occur consider semisupine chair position.
- Blood dyscrasias are rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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olanzapine/fluoxetine hydrochloride (oh-LAN-zah-peen/flew-OX-uh-teen HIGH-droe-KLOR-ide)

Symbyax

Drug Class: Antidepressant

PHARMACOLOGY

Action

Unknown; however, it is suspected that activation of 3 monoaminergic neural systems (dopamine, norepinephrine, serotonin) is responsible for an enhancement of the antidepressant effect.

Uses
Treatment of depressive episodes associated with bipolar disorder.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Benzodiazepines: Increased orthostatic hypotension with diazepam (mechanism not established); possible increased impairment of skills related to driving with diazepam or alprazolam (decreased metabolism)
- Avoid concurrent use.

Tramadol: Possible increased risk of serotonin syndrome (mechanism not established)
- Monitor clinical status.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth, tooth disorder (at least 2%); increased salivation, thirst (postmarketing).

CVS: Hypertension, tachycardia (at least 2%); bradycardia, increase in QTc interval, migraine, orthostatic hypotension, vasodilation (postmarketing).

CNS: Abnormal thinking, somnolence, tremor (at least 5%); amnesia, decreased libido, hyperkinesias, personality disorder, sleep disorder (at least 2%).

GI: Increased appetite (at least 5%); diarrhea.

RESP: Dyspnea (at least 2%); bronchitis; lung disorder (postmarketing).

MISC: Asthenia (at least 5%); accidental injury, fever, speech disorder (at least 2%); chest pain (at least 1%); chills, infection, neck pain and rigidity, photosensitivity reaction (postmarketing).

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several minutes at the end of the dental appointment before dismissing.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.

Oral Health Education
- Inform patient of the danger of severe sunburn with this drug.
- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.
- Encourage patient to follow daily plaque control procedures for effective self-care.

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olmesartan medoxomil (ole-mih-SAR-tan meh-DOX-oh-mill)
Benicar

Drug Class: Antihypertensive; Angiotensin II antagonist

PHARMACOLOGY
Action
Blocks vasoconstrictor effects of angiotensin II by selectively blocking the binding of angiotensin II to the AT_1 receptor in vascular smooth muscle.

Uses
Treatment of hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Dizziness; fatigue; vertigo; insomnia.

GI: Abdominal pain; dyspepsia; gastroenteritis; nausea.

MISC: Chest pain; peripheral edema; arthritis; myalgia; skeletal pain.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short afternoon appointments.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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olmesartan medoxomil/hydrochlorothiazide (ol-me-SAR-tan me-DOX-oh-mil/HYE-droe-KLOR-oh-THYE-a-zide)

Benicar HCT

Drug Class: Antihypertensive combination

PHARMACOLOGY

Uses

Treatment of hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

NSAIDs: Decreased diuretic and antihypertensive effects of hydrochlorothiazide (decreased prostaglandin synthesis leading to additive decrease in free water excretion)

- Monitor blood pressure.

Sympathomimetic amines: Hypokalemia with epinephrine (intracellular uptake of potassium)

- Monitor vital signs.
- Use local anesthetic agents with a vasoconstrictor with caution.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Dizziness (9%); vertigo (greater than 1%); asthenia (postmarketing).

CVS: Hypotension, chest pain.

GI: Nausea (3%); abdominal pain, diarrhea, dyspepsia, gastroenteritis (greater than 1%); vomiting (postmarketing).

RESP: Upper respiratory tract infection (7%); coughing (greater than 1%).

MISC: Peripheral edema (greater than 1%); angioedema (postmarketing).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or

in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Use cardiac dose of vasoconstrictor (no more than 2 cartridges of 1:100,000 or 4 cartridges of 1:200,000). Use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care in patients with cardiovascular disease.
- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.

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olopatadine HCl (oh-low-pat-AD-een HIGH-droe-KLOR-ide)

Patanol

Drug Class: Ophthalmic antihistaminic agent

PHARMACOLOGY

Action
Inhibits release of histamine from mast cells and relatively selective histamine H_1 antagonist. Inhibits type 1 immediate hypersensitivity reactions.

Uses
Temporary relief of itching caused by allergic conjunctivitis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Taste disturbance.

RESP: Pharyngitis, rhinitis, sinusitis; cold syndrome.

MISC: Asthenia; headache.

CLINICAL IMPLICATIONS

General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Photophobia*: Direct dental light out of patient's eyes and offer dark glasses for comfort.

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omalizumab (oh-mah-lie-ZOO-mab)

Xolair

Drug Class: Monoclonal antibody

PHARMACOLOGY

Action
Selectively binds to human IgE, inhibiting the binding of IgE to the high-affinity IgE receptor on the surface of mast cells and basophils and limiting the degree of release of mediators of the allergic response.

Uses
Treatment of moderate to severe persistent asthma in patients who have a positive skin test result or in vitro reactivity to a perennial aeroallergen and whose symptoms are inadequately controlled with inhaled corticosteroids.

Unlabeled Uses
Seasonal allergic rhinitis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
CNS: Headache (15%); fatigue, dizziness (3%).

RESP: URI (20%); viral infections (23%); sinusitis, pharyngitis.

MISC: Injection site reactions (e.g., bruising, redness, warmth, burning, stinging, itching, hive formation, pain, indurations, mass, inflammation [45%]); viral infections (23%); arthralgia (8%); pain (7%); leg pain (4%); fracture, arm pain (2%); malignancy (0.5%); hypersensitivity (e.g., urticaria, dermatitis, pruritus, anaphylaxis).

CLINICAL IMPLICATIONS
General
- This is a single-dose, SC administration product.
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Consider semisupine chair position to assist respiratory function.

Oral Health Education
- Instruct patient to bring bronchodilator inhaler to each dental appointment.

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omeprazole (oh-MEH-pray-ZAHL)
Prilosec, Prilosec OTC, Zegerid

Losec

Inhibitron, Olexin, Osiren, Ozoken, Prazidec, Prazolit, Ulsen

Drug Class: GI; Proton pump inhibitor

PHARMACOLOGY
Action
Suppresses gastric acid secretion by blocking acid (proton) pump within gastric parietal cell.

Uses
Short-term treatment of active duodenal ulcer, gastroesophageal reflux disease (GERD), including erosive esophagitis and symptomatic GERD; long-term treatment of pathological hypersecretory conditions (e.g., Zollinger-Ellison syndrome, multiple endocrine adenomas, systemic mastocytosis); to maintain healing of erosive esophagitis; in combination with clarithromycin to eradicate *Helicobacter pylori*, use clarithromycin and amoxicillin in combination with omeprazole in patients with a 1-yr history of duodenal ulcers or active duodenal ulcers to eradicate *H. pylori*; short-term treatment of active benign gastric ulcer; heartburn.

Unlabeled Uses
Posterior laryngitis; enhanced efficacy of pancreatin for treatment of steatorrhea in patients with cystic fibrosis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole or itraconazole: Decreased ketoconazole or itraconazole effect (decreased absorption)
- Avoid concurrent use.

Ketoconazole: Possible omeprazole toxicity (decreased metabolism)
- Avoid concurrent use.

Benzodiazepams: Possible increased benzodiazepam toxicity (decreased metabolism)
- Monitor clinical status.

ADVERSE EFFECTS

CNS: Headache (7%); dizziness (2%); asthenia.

MISC: Back pain.

GI: Diarrhea, nausea (4%); flatulence, vomiting (3%); abdominal pain; acid regurgitation; constipation.

RESP: Cough, URI (≥1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If patient has GI disease, consider semisupine chair position.
- Anticipate chemical erosion of teeth.
- Substernal pain (heartburn) may mimic pain of cardiac origin.

Oral Health Education

- Inform patient that toothbrushing should not be done following reflux, but to only rinse mouth with water, then use home fluoride product to minimize chemical erosion caries.

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omeprazole/sodium bicarbonate (oh-ME-pray-zol/SO-dee-um by-KAR-boe-nate)

Zegerid

Drug Class: Proton pump inhibitor combination

PHARMACOLOGY

Uses

Short-term treatment of active duodenal ulcer; short-term treatment of active benign gastric ulcer; treatment of heartburn and other symptoms associated with gastroesophageal reflux disease (GERD); short-term treatment of erosive esophagitis; maintain healing of erosive esophagitis; reduction of risk of upper GI bleeding in critically ill patients (oral suspension).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Benzodiazepines: Possible diazepam, flurazepam, clorazepate, and triazolam toxicity (decreased metabolism)
- Monitor patient response.

ADVERSE EFFECTS

Oral: Oral candidiasis (4%).

CVS: Hypotension (10%); hypertension (8%); atrial fibrillation (6%); ventricular tachycardia (5%); bradycardia (4%); supraventricular tachycardia, tachycardia (3%).

CNS: Agitation (3%); seizures, tetany (sodium bicarbonate).

GI: Constipation (5%); diarrhea, gastric hypomotility (2%).

RESP: Nosocomial pneumonia (11%); acute respiratory distress syndrome (3%); respiratory failure (2%); pneumothorax (1%).

MISC: Pyrexia (20%); hyperpyrexia, sepsis (5%); edema (3%); candidal infection (2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function.
- Anticipate oral candidiasis.

Oral Health Education

- Inform patient not to brush teeth following reflux, but to rinse with water, then use home fluoride product to minimize chemical erosion caries.

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ondansetron HCl (ahn-DAN-SEH-trahn HIGH-droe-KLOR-ide)

Zofran, Zofran ODT

Drug Class: Antiemetic; Antivertigo

PHARMACOLOGY

Action

Selective serotonin (5-HT_3) receptor antagonist that inhibits serotonin receptors in GI tract or chemoreceptor trigger zone.

Uses

PARENTERAL AND ORAL: Prevention of nausea and vomiting with initial and repeat courses of emetogenic cancer chemotherapy, including high-dose cisplatin; prevention of postoperative nausea or vomiting.

ORAL: Prevention of nausea and vomiting associated with radiation therapy in patients receiving either total body irradiation, single high-dose fraction to the abdomen, or daily fractions to the abdomen; prevention of nausea and vomiting associated with highly emetogenic cancer chemotherapy, including cisplatin (50 mg/m^2).

Unlabeled Uses

Treatment of nausea and vomiting associated with acetaminophen poisoning or prostacyclin therapy; treatment of acute levodopa-induced psychosis (e.g., visual hallucinations); reduction in bulimic episodes due to bulimia nervosa; treatment of spinal or epidural morphine-induced pruritus; management of social anxiety disorder.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Tramadol: Possible decreased analgesic effect (pharmacologic antagonism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (2%).

CNS: Headache; seizures.

CVS: Arrhythmias (6%); hypotension (3% to 5%); chest pain (2%); hypertension (2.5%).

GI: Constipation (9%); abdominal pain.

RESP: Bronchospasm.

MISC: Fever; anaphylaxis; weakness.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- This drug is used for short-course therapy to prevent nausea. If dental care is needed, consider semisupine chair position.
- Monitor vital signs.

Oral Health Education

- Encourage daily plaque control procedures to increase oral health.

oral contraceptives (combination products) (OR-al kon-tra-SEP-tivs)

Alesse, Angeliq, Apri, Aviane, Brevicon, Cryselle, Cyclessa, Demulen 1/35, Demulen 1/50, Desogen, Enpresse, Estrostep 21, Estrostep Fe, Jenest-28, Kariva, Lessina, Levlen, Levlite, Levora 0.15/30, Loestrin 21 1/20, Loestrin 21 1.5/30, Loestrin Fe 1/20, Loestrin Fe 1.5/30, Lo/Ovral, Low-Ogestrel, Microgestin Fe 1/20, Microgestin Fe 1.5/30, Mircette, Modicon, Mononessa, Necon 0.5/35, Necon 1/35, Necon 1/50, Necon 10/11, Nordette, Norinyl 1 + 35, Norinyl 1 + 50, Nortrel 0.5/35, Nortrel 1/35, Ogestrel 0.5/50, Ortho-Cept, Ortho-Cyclen, OrthoEvra, Ortho-Novum 1/50, Ortho-Novum 1/35, Ortho-Novum 7/7/7, Ortho-Novum 10/11, Ortho Tri-Cyclen, Ortho Tri-Cyclen Lo, Ovcon-35, Ovcon-50, Ovral-28, Portia, Seasonale, Sprintec, Tri-Levlen, Tri-Norinyl, Triphasil, Trivora-28, Yasmin, Yaz, Zovia 1/35E, Zovia 1/50E

Drug Class: Hormone; Contraceptive

PHARMACOLOGY

Action

Inhibits ovulation by suppressing gonadotropins, follicle-stimulating hormone, and luteinizing hormone.

Uses

Prevention of pregnancy.

Unlabeled Uses

Postcoital contraceptive.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Acetaminophen: Possible decreased analgesic effect (increased metabolism)
- Monitor analgesia.

Antibiotics: Possible reduction of contraceptive effect
- Use nonhormonal form of birth control during course of antibiotics and for 1 week following completion of antibiotics.

Diazepam: Possible IV diazepam toxicity (mechanism not established)
- Use with caution.

ADVERSE EFFECTS

⚠ **ORAL:** Gingival bleeding.

CVS: Coronary thrombosis; MI; hypertension.

CNS: Cerebral thrombosis; cerebral hemorrhage; migraine; mental depression.

GI: Nausea and vomiting; abdominal cramps; bloating; mesenteric thrombosis.

RESP: Pulmonary embolism.

CLINICAL IMPLICATIONS

General

- If antiinfective therapy is needed for oral infection, recommend additional birth control method during antimicrobial therapy.
- Monitor vital signs.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.
- Inform patient who smokes about the risks of using tobacco products with estrogens (increased blood clots).
- Caution patient that antibiotics may decrease effectiveness of oral contraceptives and to use a nonhormonal form of contraception while taking antibiotics and for 7 days after stopping antibiotics.

oral contraceptives (progestin-only products) (OR-al kon-tra-SEP-tivs)

Micronor, Nor-Q.D., Ovrette

Drug Class: Hormone; Contraceptive

PHARMACOLOGY

Action

Alters cervical mucus, interferes with implantation, and may suppress ovulation.

Uses

Prevention of pregnancy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Antibiotics: Possible reduction of contraceptive effect

- Use nonhormonal form of birth control during course of antibiotics and for 1 week following completion of antibiotics.

ADVERSE EFFECTS

CVS: Thrombophlebitis; cerebrovascular disorders.

CNS: Depression; tiredness; fatigue.

RESP: Pulmonary embolism.

MISC: Breast changes; masculinization of female fetus; edema; weight change.

CLINICAL IMPLICATIONS

General

- Monitor vital signs.
- If antiinfective therapy is needed for oral infection, recommend additional birth control method.

Oral Health Education

- Inform patient who smokes about the risks of using tobacco products with estrogens (increased blood clots).

orlistat (ORE-lih-stat)

Xenical

Drug Class: Gastrointestinal lipase inhibitor

PHARMACOLOGY

Action

Reversible lipase inhibitor for obesity management that acts by inhibiting absorption of dietary fats.

Uses

Obesity management including weight loss and weight maintenance when used in combination with a reduced-calorie diet; reduction of risk for weight regain after prior weight loss.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Gingival disorder (4%); unspecified tooth disorder (4%).

CNS: Anxiety; depression; dizziness; headache.

GI: Abdominal pain/discomfort (25.5%); oily spotting, fatty/oily stool, oily evacuation; flatus with discharge; fecal urgency, increased defecation, fecal incontinence; infectious diarrhea; nausea; rectal pain/discomfort; vomiting.

RESP: Ear, nose, and throat symptoms; influenza (40%); lower respiratory tract infection; URI (38%).

MISC: Fatigue; pedal edema; sleep disorder; urinary tract infection.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If GI side effects occur, consider semisupine chair position.

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oseltamivir phosphate (oh-sell-TAM-ih-veer FOSS-fate)

Tamiflu

Drug Class: Anti-infective; Antiviral

PHARMACOLOGY

Action

Inhibition of influenza virus neuraminidase with possible alteration of virus particle aggregation and release.

Uses

Treatment of uncomplicated acute illness caused by influenza infection in patients >1 yr who have been symptomatic for ≤2 days; prophylaxis of influenza in patients ≥13 yr.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Swelling of tongue.

CNS: Insomnia, vertigo (1%); seizure, confusion.

GI: Nausea (10%); vomiting (9%).

RESP: Bronchitis (2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- Monitor body temperature and respiratory system to determine infectivity.
- If GI side effects occur, consider semisupine chair position.

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oxaprozin (ox-uh-PRO-zin)

Daypro

Apo-Oxaprozin, Rhoxal-oxaprozin

Drug Class: Analgesic; NSAID

PHARMACOLOGY

Action

Decreases inflammation, pain, and fever, probably through inhibition of cyclooxygenase activity and prostaglandin synthesis.

Uses

Relief of symptoms of rheumatoid arthritis and osteoarthritis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety

ADVERSE EFFECTS

⚠ **ORAL:** Stomatitis.

CNS: Depression; sedation; somnolence; confusion; disturbed sleep.

GI: Gastric distress; peptic ulcers; occult blood loss; diarrhea, nausea, dyspepsia (9%); constipation; vomiting; flatulence; anorexia; abdominal distress/cramps/pain; agranulocytosis, leukopenia, thrombocytopenia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Arthritis*: Consider patient comfort and need for semisupine chair position.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias are rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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oxazepam (ox-AZE-uh-pam)

Serax

Apo-Oxazepam

Drug Class: Antianxiety; Benzodiazepine

PHARMACOLOGY

Action

Potentiates action of GABA, an inhibitory neurotransmitter, resulting in increased neuronal inhibition and CNS depression, especially in limbic system and reticular formation.

Uses

Control of anxiety, anxiety associated with depression; control of anxiety, tension, agitation, and irritability in elderly; treatment of alcoholic patients with acute tremulousness, inebriation, or anxiety associated with alcohol withdrawal.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; gingival pain; salivation; coated tongue; difficulty in swallowing.

CNS: Drowsiness; dizziness; lethargy; vertigo; tremor; fatigue; memory impairment; disorientation; anterograde amnesia; ataxia; hallucinations; restlessness; headache; slurred speech; stupor; euphoria; paradoxical reactions (e.g., anger, hostility, mania, insomnia).

CVS: Bradycardia or tachycardia; hypertension or hypotension; palpitations.

GI: Nausea.

MISC: Dependence/withdrawal syndrome (e.g., confusion, abnormal perception of movement, depersonalization, muscle twitching, psychosis, paranoid delusions, seizures); edema; altered libido; incontinence; fever; menstrual irregularities; blood dyscrasias including agranulocytosis, leukopenia, anemia, thrombocytopenia, others.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.

- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Monitor vital signs.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Blood dyscrasias are rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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oxcarbazepine (ox-kar-BAZE-uh-peen)

Trileptal

Drug Class: Antiepileptic

PHARMACOLOGY

Action

The pharmacological activity is primarily through the 10-monohydroxy metabolite (MHD) of oxcarbazepine, but the exact mechanism is unknown. It may block voltage-sensitive sodium channels resulting in stabilization of hyperexcited neural membranes, inhibition of repetitive neuronal firing, and diminution of propagation of synaptic impulses.

Uses

As monotherapy or adjunctive therapy in the treatment of partial seizures in patients with epilepsy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; toothache; taste disturbance (high doses).

CNS: Ataxia; abnormal coordination; fatigue; asthenia; headache; dizziness; somnolence; anxiety; abnormal gait; insomnia; tremor; amnesia; nervousness; agitation; confusion; speech disorder; aggravated convulsions.

CVS: Chest pain; hypotension (high doses).

GI: Nausea (15% to 29%); vomiting; abdominal pain; anorexia; diarrhea; dyspepsia; constipation; gastritis; rectum hemorrhage.

RESP: Rhinitis; URI; cough; bronchitis; pharyngitis; epistaxis; sinusitis.

MISC: Muscle weakness; back pain; sprains/strains; fever; allergy; weight increase; infection; lymphadenopathy.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine level of disease control, type and frequency of seizure, and compliance with medication regimen.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- Determine need for power toothbrush for self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

oxidized cellulose

Oxycel: Pads: 3″ × 3″, 8 ply; Pledgets: 2″ × 1″ × 1″; Strips: 18″ × 2″, 4 ply
Surgicel: Strips: 2″ × 14″, 4″ × 8″, 2″ × 3″, ½″ × 2″; Surgical Nu-knit: 1″ × 1″, 3″ × 4″, 6″ × 9″

Drug Class: Hematological agent

PHARMACOLOGY

Action

Forms a matrix for fibrin deposition and propagation of blood clot.

Uses

Hemorrhage: Used adjunctively in surgical procedures to assist in the control of capillary, venous, and small arterial hemorrhage when ligation or other conventional methods of control are impractical or ineffective. Also indicated for use in oral surgery and exodontia.

Contraindications

Packing or wadding as a hemostatic agent; packing or implantation in fractures or laminectomies (it interferes with bone regeneration and can cause cyst formation); control of hemorrhage from large arteries or on nonhemorrhagic serous oozing surfaces since body fluids other than whole blood (e.g., serum) do not react with oxidized cellulose to produce satisfactory hemostatic effects; do not use around the optic nerve and chiasm; do not use as a wrap in vascular surgery because it has a stenotic effect.

Usual Dosage

Local bleeding associated with oral surgical procedures

STRIPS OR PADS

ADULTS AND CHILDREN: Apply strips or pads as a surgical dressing for wounds or over extraction sites (do not place into a socket).

DRUG INTERACTIONS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

MISC: Foreign body reaction.

CLINICAL IMPLICATIONS

General

- Apply by loosely packing against the bleeding surface. Avoid wadding or packing tightly. **Use sparingly.**
- Application of topical thrombin solution to cellulose gauze will inactivate thrombin due to acidity.
- Ensure therapeutic response and decreased bleeding before patient dismissed.

Pregnancy Risk Category: No information available.

Oral Health Education

- Advise patient to report uncontrolled bleeding to dentist.

oxybutynin Cl (OX-ee-BYOO-tih-nin KLOR-ide)

Ditropan, Ditropan XL, Oxytrol

Apo-Oxybutynin, Gen-Oxybutynin, Novo-Oxybutynin, Nu-Oxybutynin, PMS-Oxybutynin

Tavor

Drug Class: Antispasmodic, urinary

PHARMACOLOGY

Action

Increases bladder capacity; diminishes frequency of uninhibited contractions of detrusor muscle; and delays initial desire to void.

Uses

Treatment of symptoms of bladder instability associated with voiding in patients with uninhibited and reflex neurogenic bladder (e.g., urinary leakage, dysuria); treatment of overactive bladder with symptoms of urge urinary incontinence, urgency, and frequency (extended release [ER] tablet).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** ER TABLETS: Dry mouth (60.8%).
IMMEDIATE-RELEASE TABLETS AND SYRUP: Dry mouth.
TRANSDERMAL SYSTEM: Dry mouth.

CNS: ER TABLETS: Somnolence (11.9%); headache (9.8%); dizziness (6.3%); drowsiness, hallucinations, restlessness, insomnia, nervousness, confusion (2% to <5%).
IMMEDIATE-RELEASE TABLETS AND SYRUP: Dizziness; drowsiness; hallucinations; insomnia; restlessness.
TRANSDERMAL SYSTEM: Fatigue; somnolence; headache (>1%).

GI: ER TABLETS: Constipation (13.1%); diarrhea (9.1%); nausea (8.9%); dyspepsia (6.8%); vomiting, decreased GI motility, flatulence, gastroesophageal reflux (2% to <5%).
IMMEDIATE-RELEASE TABLETS AND SYRUP: Constipation; decreased GI motility; nausea.
TRANSDERMAL SYSTEM: Diarrhea, constipation (≥2%); abdominal pain, nausea, flatulence (>1%).

RESP: ER TABLETS: URI, cough, bronchitis (2% to <5%).

MISC: ER TABLETS: Asthenia, pain (6.8%); rhinitis (5.6%); UTI (5.1%); decreased sweating, suppression of lactation, abdominal pain, accidental injury, back pain, flulike syndrome, arthritis (2% to <5%).
IMMEDIATE-RELEASE TABLETS AND SYRUP: Asthenia; impotence; suppression of lactation.
TRANSDERMAL SYSTEM: Flushing, back pain, application site burning (>1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *Appointment planning:* Short appointments are recommended.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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oxycodone HCl (OX-ee-KOE-dohn HIGH-droe-KLOR-ide)

Endocodone, M-oxy, OxyContin, Oxydose, OxyFAST, OxyIR, Percolone, Roxicodone, Roxicodone Intensol

Supeudol

Drug Class: Narcotic analgesic
DEA Schedule: Schedule II

PHARMACOLOGY

Action

Relieves pain by stimulating opiate receptors in CNS; may cause respiratory depression, peripheral vasodilation, inhibition of intestinal peristalsis, sphincter of Oddi spasm, stimulation of chemoreceptors that cause vomiting and increased bladder tone.

Uses

Relief of moderate to moderately severe pain.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disturbance.
CNS: Lightheadedness; dizziness; sedation; disorientation; incoordination.
CVS: Bradycardia (frequent); flushing; tachycardia; arrhythmia; palpitations, hypertension or hypotension; orthostatic hypotension, syncope.
GI: Nausea; vomiting; constipation; abdominal pain.
RESP: Respiratory depression; laryngospasm; depression of cough reflex.
MISC: Tolerance; psychological and physical dependence with long-term use.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse, respiration).
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Avoid prescribing opioids for dental pain. Acetaminophen is appropriate if GI bleeding is present.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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paliperidone (PAL-ee-PER-i-done)

Invega

Drug Class: Benzisoxazole derivative

PHARMACOLOGY

Action

Antipsychotic effects, possibly due to dopamine and serotonin receptor blockade in the CNS.

Uses

Acute and maintenance treatment of schizophrenia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Salivary hypersecretion (4%); dry mouth (3%).
CVS: Tachycardia (14%); orthostatic hypotension, prolonged QTc interval (5%); bundle branch block (3%); abnormal electrocardiogram T wave, first-degree AV block, increased blood pressure, sinus arrhythmia (2%); palpitations (at least 1%).

CNS: Headache (14%); somnolence (11%); akathisia, hyperkinesia (10%); anxiety, dyskinesia (9%); extrapyramidal disorder (7%); dizziness (6%); dystonia (5%); hypertonia, tremor (4%); asthenia, fatigue, parkinsonism, pyrexia (2%).

GI: Nausea (6%); dyspepsia (5%); upper abdominal pain (3%); abdominal pain (at least 1%).

RESP: Cough (3%); dyspnea (at least 1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Monitor vital signs.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several minutes at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.

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pantoprazole sodium (pahn-TOE-prazz-ole SO-dee-uhm)

Protonix, Protonix IV

Panto IV, Pantoloc

Pantozol, Zurcal

Drug Class: GI; Proton pump inhibitor

PHARMACOLOGY

Action

Suppresses gastric acid secretion by blocking acid (proton) pump within gastric parietal cells.

Uses

ORAL: Short-term (no longer than 8 wk) treatment in the healing and symptomatic relief of erosive esophagitis associated with gastroesophageal reflux disease (GERD); long-term treatment of pathologic hypersecretory conditions, including Zollinger-Ellison syndrome; maintenance of healing of erosive esophagitis.

IV: Short-term (7- to 10-day) treatment of GERD, as an alternative to oral therapy in patients unable to continue oral pantoprazole; hypersecretory conditions associated with Zollinger-Ellison syndrome or other neoplastic conditions.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole or itraconazole: Decreased ketoconazole or itraconazole effect (decreased absorption)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Increased salivation.

CNS: Headache (9%); insomnia (1%); anxiety, asthenia, increased dizziness, hypertonia (≥1%); anterior ischemic optic neuropathy, confusion, hypokinesia, speech disorder, tinnitus, vertigo.

GI: Diarrhea (6%); flatulence, abdominal pain (4%); nausea, vomiting (2%); eructation (1%); constipation, dyspepsia, gastroenteritis, GI disorder, vomiting (≥1%); pancreatitis.

RESP: Bronchitis, cough, dyspnea, sinusitis, upper respiratory tract infection (≥1%).

MISC: Chest pain, flu-like syndrome, infection, pain (≥1%); anaphylaxis, angioedema, rhabdomyolysis.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If patient has GI disease, consider semisupine chair position.
- Drugs that lower acidity in intestinal tract may interfere with absorption of some antibiotics (penicillin, tetracyclines).
- Anticipate chemical erosion of teeth.
- Substernal pain (heartburn) may mimic pain of cardiac origin.
- Use COX inhibitors with caution, as they may exacerbate PUD and GERD.

Oral Health Education

- Inform patient that toothbrushing should not be done after reflux, but to only rinse mouth with water, then use home fluoride product to minimize chemical erosion caries.

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paroxetine (puh-ROKS-uh-teen)

(paroxetine mesylate, paroxetine HCl)

Paxil, Paxil CR, Pexeva

Aropax

Drug Class: Antidepressant

PHARMACOLOGY

Action

Blocks reuptake of serotonin, enhancing serotonergic function.

Uses

Panic disorder or social anxiety disorder (except Pexeva); major depressive disorder.

IMMEDIATE RELEASE ONLY: Obsessive-compulsive disorder (OCD); generalized anxiety disorder (GAD) (except Pexeva); posttraumatic stress disorder (PTSD) (except Pexeva).

CONTROLLED RELEASE ONLY: Premenstrual dysphoric disorder (PMDD).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

Incidences of adverse reactions are stated in broad ranges because those reported varied depending on the dose or indication.

⚠ **ORAL:** Dry mouth ((5%); tooth disorder/caries (1%).

CNS: Headache, somnolence, dizziness, insomnia, tremor, nervousness, anxiety, decreased libido ((5%); paresthesia, drugged feeling, confusion, agitation, abnormal dreams, migraine, impaired concentration, depersonalization, myoclonus, amnesia, stimulation, depression, emotional lability, vertigo (1% to 4%); neuroleptic malignant syndrome; extrapyramidal symptoms; status epilepticus; eclampsia.

CVS: Chest pain; palpitations; tachycardia; vasodilation; hypertension.

GI: Nausea, constipation, diarrhea, abdominal pain, decreased appetite (5%); flatulence; oropharynx disorder, dyspepsia, increased appetite, vomiting (1% to 4%).

RESP: Yawn, increased cough (1% to 4%); pulmonary hypertension; allergic alveolitis.

MISC: Asthenia (5%); chest pain, back pain, chills, trauma, allergic reaction, photosensitivity, malaise (1% to 4%); Guillain-Barré syndrome; prolactinemia; galactorrhea; serotonin syndrome; anaphylaxis.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.

- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Increased photosensitization with dental drugs having photosensitization side effect.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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peginterferon alfa-2a (peg-IN-ter-FEER-on AL-fa-2a)

Pegasys

Drug Class: Immunomodulator

PHARMACOLOGY

Action

Binds to specific receptors on cell surface and initiates a complex cascade of protein-protein interactions, leading to rapid activation of gene transcription. Interferon-stimulated genes regulate many biologic effects (e.g., inhibition of viral replication of infected cells, inhibition of cell proliferation, immunomodulation).

Uses

Treatment of hepatitis B e antibody (HBeAg)-positive and HbeAg-negative chronic hepatitis B virus (HBV) in patients who have compensated liver disease and evidence of viral replication and liver inflammation; alone or in combination with ribavirin tablets for the treatment of chronic hepatitis C virus (HCV) in patients with compensated liver disease and those not treated previously with interferon alfa.

Unlabeled Uses

Chronic myelogenous leukemia, renal cell carcinoma.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (6%).

CNS: Fatigue/asthenia (56%); headache (54%); pyrexia (37%); insomnia, irritability/anxiety/nervousness (19%); depression (18%); dizziness (16%); concentration impairment (8%); memory impairment (5%); mood alteration (3%).

GI: Nausea/vomiting (24%); anorexia (17%); diarrhea (16%); abdominal pain (15%).

RESP: Cough, dyspnea (4%).

MISC: Pain (11%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment. Take precautions to avoid cross-contamination.
- Consider medical consult to determine disease control and influence on dental treatment.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.

penbutolol sulfate (pen-BYOO-toe-lole SULL-fate)

Levatol

Drug Class: Beta-adrenergic blocker

PHARMACOLOGY

Action

Nonselectively blocks beta-adrenergic receptors, primarily affecting the cardiovascular system (e.g., decreased heart rate, decreased cardiac contractility, decreased BP) and lungs (promotes bronchospasm).

Uses

Management of mild to moderate hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

Sympathomimetic amines: Decreased antihypertensive effect (pharmacologic antagonism; unopposed alpha-adrenergic stimulation)
- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disturbance; taste loss.

CNS: Dizziness; tiredness; fatigue; headache; insomnia; depression; short-term memory loss; emotional lability.

CVS: Hypotension; bradycardia; arrhythmia; postural hypotension.

MISC: Photosensitivity reactions.

GI: Diarrhea; nausea; dyspepsia.

RESP: Cough; dyspnea; bronchospasm.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- If GI side effects occur, consider semisupine chair position.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient, and use aspirating technique to prevent intravascular injection.
- Beta blockers may mask epinephrine-induced signs and symptoms of hypoglycemia in patients with diabetes.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

penciclovir (pen-SICK-low-vihr)

Denavir: Cream: 10 mg/g

Drug Class: Anti-infective, topical; Antiviral

PHARMACOLOGY

Action
Selectively inhibits herpes viral DNA synthesis and replication.

Uses
Treatment of recurrent herpes labialis (cold sores) in adults.

Contraindications
Standard considerations.

Usual Dosage
ADULTS: *Topical:* Apply to lesions q 2 hr while awake for 4 days. Start treatment as early as possible, during the prodrome or when lesions first appear.

DRUG INTERACTIONS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Taste alteration.

CLINICAL IMPLICATIONS

General
When prescribed by DDS:
- *Lactation:* Undetermined.
- *Children:* Safety and efficacy not established.
- *Elderly:* Side-effect profile similar to younger patients.
- Assess lesions prior to and daily during therapy.

When prescribed by medical facility:
- Determine why drug is being taken.
- Be aware that herpetic infections are infectious during prodromal, vesicular, and crusting stages.

Pregnancy Risk Category: Category B.

Oral Health Education
When prescribed by DDS:
- Instruct patient to begin treatment as soon as possible, during the prodrome, or as soon as lesions appear.
- Advise patient to apply the medication exactly as directed and to only apply to lesions on the face and lips.
- Advise patient to avoid applying cream to mucous membranes and within or near eyes.
- Advise patient to wash hands before and after applying cream.
- Advise patient to discontinue use and notify health care provider if local irritation develops.
- Advise the patient that the use of additional OTC creams or ointments may delay the healing process or even spread the disease.
- Instruct the patient to notify health care provider if the symptoms do not improve in 7 days of topical therapy.
- Instruct the patient to apply sufficient ointment to cover all lesions q 2 hr while awake.
- Advise the patient to use a finger cot or glove when applying the ointment to prevent spread of the virus.
- Recommend that toothbrush be replaced following clearance of oral infection.

penicillin V (pen-ih-SILL-in V)

Synonyms: phenoxymethyl penicillin; penicillin V potassium

Beepen-VK, Pen-Vee K, Penicillin VK: Tablets: 250, 500 mg; Powder for oral solution: 125 mg/5 mL, 250 mg/5 mL
Veetids: Tablets: 250, 500 mg; Powder for oral solution: 125 mg/5 mL
Veetids '250': Powder for oral solution: 250 mg/5 mL

APO-Pen VK, Nadopen-V, Novo-Pen-VK, Nu-Pen-VK, Pen-Vee, PVF K

Anapenil, Pen-Vi-K

Drug Class: Antibiotic, penicillin

PHARMACOLOGY

Action
Inhibits mucopeptide synthesis of bacterial cell wall.

Uses
Treatment of upper respiratory tract infections; treatment of pneumococcal, streptococcal, and staphylococcal infections and fusospirochetosis (Vincent infection) of oropharynx caused by susceptible microorganisms.

Unlabeled Uses
Prophylactic treatment of sickle cell anemia in children; treatment of anaerobic infections; treatment of Lyme disease (*Borrelia burgdorferi*).

Contraindications
Hypersensitivity to penicillins. Do not treat severe pneumonia, empyema, bacteremia, pericarditis, meningitis, or purulent or septic arthritis with oral penicillin V during acute stage.

Usual Dosage
ADULTS AND CHILDREN OVER 12 YR: *PO:* 250 to 500 mg qid.

Pharmacokinetics
ABSORP: Oral absorption is 60% to 73%. T_{max} is 0.5 to 1 hr. C_{max} is 2 to 3 mcg/mL.
DIST: Widely distributed to most tissues and body fluids; distribution into CSF is low with noninflamed meninges. Protein binding is 80%. Vd is 0.5 L/kg. Crosses the placenta and distributes into breast milk.
METAB: Hepatic biotransformation is 55%.
EXCRET: Mainly renal (20% to 40% as unchanged). $T_{1/2}$ is 0.5 to 1 hr.
SPECIAL POP: *Renal failure:* For Ccr less than 10 mL/min, $t_{1/2}$ increased to 4.1 hr.

DRUG INTERACTIONS
Allopurinol: Increased incidence of rash (mechanism unknown)
- Monitor clinical status.

ADVERSE EFFECTS
⚠ **ORAL:** Glossitis; dry mouth; black hairy tongue; candidiasis.
CNS: Dizziness; fatigue; insomnia; reversible hyperactivity; neurotoxicity (e.g., lethargy, neuromuscular irritability, hallucinations, convulsions, seizures).
GI: Gastritis; nausea; vomiting; abdominal pain or cramps; epigastric distress; diarrhea or bloody diarrhea; rectal bleeding; flatulence; enterocolitis; pseudomembranous colitis.
MISC: Hypersensitivity reactions (e.g., urticaria, angioneurotic edema, laryngospasm, laryngeal edema, bronchospasm, hypotension, vascular collapse, death, maculopapular to exfoliative dermatitis, vesicular eruptions, erythema multiforme, serum sickness, skin rashes, prostration); vaginitis; hyperthermia.

CLINICAL IMPLICATIONS

General

When prescribed by DDS:

- *Lactation:* Small amount excreted in breast milk. May cause diarrhea, candidiasis, or allergic response in nursing infant.
- *Hypersensitivity:* Reactions range from mild to life threatening. Administer drug with caution to cephalosporin-sensitive patients because of possible cross-reactivity.
- *Renal failure:* Use drug with caution; dosage adjustment may be necessary.
- *Superinfection:* May result in bacterial or fungal overgrowth of nonsusceptible organisms.
- *Pseudomembranous colitis:* May occur because of overgrowth of clostridia.
- *Streptococcal infections:* Therapy must be for a minimum of 10 days.
- *Overdosage:* Neuromuscular hyperexcitability, agitation, confusion, asterixis, hallucinations, stupor, coma, multifocal myoclonus, encephalopathy, hyperkalemia.

When prescribed by medical facility:

- Determine why drug is being taken. Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.
- If GI side effects occur, consider semisupine chair position.

Pregnancy Risk Category: Category B.

Oral Health Education

When prescribed by DDS:

- Instruct patient to complete entire course of therapy even if feeling better.
- Advise patient to use calibrated measuring device for liquid preparation.
- Instruct penicillin-allergic patient to wear Medi-Alert necklace or bracelet.
- Advise patient to use nonhormonal form of contraceptive during penicillin V therapy.
- Inform patient of the signs of hypersensitivity (e.g., skin rash, itching, hives, shortness of breath, wheezing) and other side effects (e.g., black tongue, sore throat, nausea, vomiting, severe diarrhea, fever, swollen joints). Instruct patient to notify health care provider if these symptoms occur.
- Instruct patient to notify health care provider if there is no improvement in symptoms of infection.
- Instruct patient to notify health care provider of signs of superinfection (e.g., vaginitis, black "hairy" tongue).

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pentazocine (pen-TAZ-oh-seen)

Talacen, Talwin, Talwin Compound, Talwin NX

Drug Class: Analgesic, narcotic agonist-antagonist

DEA Schedule: Schedule IV

PHARMACOLOGY

Action

Produces analgesia by an agonistic effect at the kappa opioid receptor. Weakly antagonizes effects of opiates at mu opioid receptor; does not appear to increase biliary tract pressure.

Uses

Oral and Parenteral Forms: Management of moderate to severe pain.
Parenteral Form: Preoperative or preanesthetic medication; supplement to surgical anesthesia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste alteration.
CNS: Lightheadedness; dizziness; euphoria; hallucinations; disorientation; confusion; seizures.

CVS: Hypotension, tachycardia; hypertension.
GI: Nausea.
RESP: Respiratory depression; transient apnea in newborns whose mothers received parenteral pentazocine during labor.
MISC: Anaphylaxis; tolerance; psychological and physical dependence in long-term use.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If oral pain requires additional analgesics, consider nonopioid products.
- *When prescribed by DDS:* Short-term use only; there is no justification for long-term use in the management of dental pain.
- *Geriatric patients*: Use lower dose of opioid.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- *If prescribed by DDS:* Warn patient not to drive, sign important papers, or operate mechanical equipment.

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pentobarbital sodium (pen-toe-BAR-bih-tahl SO-dee-uhm)

Nembutal Sodium: Capsules: 50, 100 mg; Suppositories: 30, 60, 120, 200 mg; Elixir: Equivalent to 20 mg/5 mL; Injection: 50 mg/mL

Drug Class: Sedative and hypnotic, barbiturate, short-acting; Anticonvulsant

DEA Schedule: Schedule II

PHARMACOLOGY

Action

Depresses sensory cortex; decreases motor activity; alters cerebellar function; and produces drowsiness, sedation, and hypnosis.

Uses

Sedation; short-term treatment of insomnia; preanesthesia; emergency control of convulsions (parenteral form).

Contraindications

Hypersensitivity to barbiturates; manifest or latent porphyria.

Usual Dosage

Sedation

ADULTS: *PO/PR:* 20 to 30 mg bid to qid.
CHILDREN: *PO/IM:* 2 to 6 mg/kg (max, 100 mg). *IV:* 50 mg.

Pediatric patients unable to take orally or by injection

CHILDREN 12 TO 14 YR (36.4 TO 50 KG): *PR:* 60 or 120 mg.
CHILDREN 5 TO 12 YR (18.2 TO 36.4 KG): *PR:* 60 mg.
CHILDREN 1 TO 4 YR (9 TO 18.2 KG): *PR:* 30 or 60 mg.

Pharmacokinetics

ABSORP: Pentobarbital sodium is absorbed in varying degrees. T_{max} is 15 min (IV), maximal CNS depression.
DIST: Rapidly distributed to all tissues and fluids with high concentration in brain, liver, and kidneys due to lipid solubility. Protein binding is 60% to 70%. Pentobarbital sodium distributes into breast milk.

METAB: Metabolized by hepatic microsomal enzyme system.
EXCRET: Urine (very little unchanged); less commonly in the feces. The $t_{1/2}$ is 15 to 50 hr.
ONSET: Immediate following IV administration.
DURATION: 3 to 4 hr.

DRUG INTERACTIONS

Alcohol: Decreased sedative effect with long-term alcohol abuse (increased metabolism)
- Avoid concurrent use.

Beta-adrenergic blockers: Decreased beta-blocker effect (increased metabolism)
- Avoid concurrent use.

Nortriptyline: Decreased antidepressant effect (increased metabolism)
- Avoid concurrent use.

Quinidine: Decreased quinidine effect (increased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS

CVS: Bradycardia; hypotension; syncope.
CNS: Drowsiness; agitation; confusion; headache; hyperkinesia; ataxia; CNS depression; paradoxical excitement; nightmares; psychiatric disturbances; hallucinations; insomnia; dizziness.
GI: Nausea; vomiting; constipation.
RESP: Hypoventilation; apnea; laryngospasm; bronchospasm.
MISC: Hypersensitivity reactions (e.g., angioedema, rashes, exfoliative dermatitis); fever; injection site reactions (e.g., local pain, thrombophlebitis).

CLINICAL IMPLICATIONS

General

When prescribed or used by DDS:
- *Lactation:* Excreted in breast milk.
- *Children:* May respond with excitement rather than depression.
- *Elderly:* More sensitive to drug effects; dosage reduction is required.
- *Renal failure:* Use drug with caution; dosage reduction may be required.
- *Hepatic failure:* Use drug with caution; dosage reduction may be required.
- Monitor blood pressure, pulse, and respiration.
- *Dependence:* Tolerance or psychological and physical dependence may occur with continued use.
- *IV administration:* Do not exceed maximal IV rate; respiratory depression, apnea, and hypotension may result. Parenteral solutions are highly alkaline; extravasation may cause tissue damage and necrosis. Inadvertent intra-arterial injection may lead to arterial spasm, thrombosis, and gangrene.
- *Seizure disorders:* Status epilepticus may result from abrupt discontinuation.
- *Overdosage:* CNS and respiratory depression, Cheyne-Stokes respiration, areflexia, constriction of pupils, oliguria, tachycardia, hypotension, lowered body temperature, coma, apnea, circulatory collapse, respiratory arrest, death.

Pregnancy Risk Category: Category D.

Oral Health Education

When prescribed or used by DDS:
- Warn patient that medication may be habit forming and for this reason it is important to take medicine exactly as directed. Taking too little or too much can have serious complications.
- Instruct patient to report the following symptoms to health care provider: nausea, vomiting, drowsiness, dizziness, fever, sore throat, mouth sores, easy bleeding, bruising, skin irritation, or exaggerated sunburn.
- Caution patient to avoid intake of alcoholic beverages or other CNS depressants.
- Advise patient that drug may cause drowsiness, and to use caution while driving or performing other tasks requiring mental alertness.

pergolide mesylate (PURR-go-lide MEH-sih-LATE)

Permax

Drug Class: Antiparkinson

PHARMACOLOGY

Action

Directly stimulates postsynaptic dopamine receptors in nigrostriatal system.

Uses

Adjunctive treatment to levodopa-carbidopa in management of Parkinson disease.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (3.7%).

CNS: Dyskinesia (62.4%); dizziness (19.1%); hallucinations (13.8%); dystonia (11.6%); confusion (11.1%); somnolence (10.1%); insomnia (7.9%); anxiety (6.4%); personality disorder; psychosis; extrapyramidal syndrome; incoordination; akinesia; hypertonia; neuralgia; akathisia.

CVS: Postural hypotension (9%), vasodilation, palpitations, hypotension, syncope, chest pain (>2%); hypertension, arrhythmia (1%).

GI: Nausea (24.3%); constipation (10.6%); diarrhea (6.4%); dyspepsia (6.4%); anorexia (4.8%); vomiting (2.7%); abdominal pain (5.8%).

RESP: Rhinitis (12.2%); dyspnea (4.8%); epistaxis; hiccups.

MISC: Pain (7%); accidental injury; flu-like syndrome; chills; peripheral edema (7.4%); facial edema; edema; weight gain; anemia; bursitis; myalgia; twitching; infection.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Extrapyramidal behaviors associated with Parkinson disease can complicate access to oral cavity and complicate oral procedures.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs.
- *Postural hypotension*: Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

perindopril erbumine (per-IN-doe prill ehr-BYOO-meen)

Aceon

Coversyl

Drug Class: Antihypertensive; Angiotensin-converting enzyme (ACE) inhibitor

PHARMACOLOGY

Action

Competitively inhibits angiotensin I–converting enzyme, resulting in prevention of angiotensin I conversion to angiotensin II, a potent vasoconstrictor that also stimulates aldosterone

P

release. Clinical consequences are a decrease in BP, reduced sodium resorption, and potassium retention.

Uses
Treatment of essential hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth (1%).
CNS: Dizziness (8%); cerebrovascular accident (0.2%).
CVS: Chest pain; palpitations.
GI: Dyspepsia (2%).
RESP: Cough (12%); pulmonary fibrosis (<0.1%).
MISC: Back pain (6%); viral infection, upper extremity pain, hypertonia (3%); fever (2%); angioedema (0.1%); anaphylactoid reactions.

CLINICAL IMPLICATIONS
General
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient, and use aspirating technique to prevent intravascular injection.
- If coughing is problematic, consider semisupine chair position for treatment.
- Susceptible patients with DM may experience severe recurrent hypoglycemia.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Place on frequent maintenance schedule to avoid periodontal inflammation.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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perphenazine (per-FEN-uh-zeen)
Perphenazine
Apo-Perphenazine
Leptopsique
Drug Class: Antipsychotic, phenothiazine; Antiemetic

PHARMACOLOGY
Action
Effects apparently caused by postsynaptic dopamine receptor blockade in CNS.

Uses
Management of psychotic disorders; treatment of schizophrenia; control of severe nausea/vomiting in adults.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Tardive dyskinesia; tongue ache (unspecified).

CNS: Lightheadedness, faintness, dizziness; pseudoparkinsonism; dystonia; dyskinesia, motor restlessness; oculogyric crisis; hyperreflexia; drowsiness, fatigue; headache; abnormalities of the cerebrospinal fluid proteins; paradoxical excitement or exacerbation of psychotic symptoms; catatonic-like states; weakness; tremor; paranoid reactions; lethargy; seizures; hyperactivity; nocturnal confusion; bizarre dreams; vertigo; insomnia.

CVS: Pulse rate changes.

GI: Dyspepsia; adynamic ileus (may result in death); nausea; vomiting; constipation.

RESP: Laryngospasm; bronchospasm; dyspnea.

MISC: Increases in appetite and weight; polydipsia; increased prolactin levels; photophobia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Place on frequent maintenance schedule to avoid periodontal inflammation.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- Encourage daily plaque control procedures for effective self-care.

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phenelzine sulfate (FEN-uhl-zeen SULL-fate)

Nardil

Drug Class: Antidepressant; MAO inhibitor

PHARMACOLOGY

Action

Phenelzine blocks activity of enzyme MAO, thereby increasing monoamine (e.g., epinephrine, norepinephrine, serotonin) concentrations in CNS.

Uses

Treatment of atypical ("nonendogenous" or "neurotic") depression; management of depression in patients unresponsive to other antidepressant drugs.

Unlabeled Uses

Treatment of bulimia; treatment of cocaine addiction; control of panic disorder with agoraphobia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Tramadol: Increased risk of serotonin syndrome (reduced reuptake)
- Avoid concurrent use.

Sympathomimetic amines: Severe hypertension (additive)
- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Dizziness; headache; sleep disturbances; tremors; hyperflexemia; manic symptoms; convulsions; toxic delirium; coma.

CVS: Postural hypotension, tachycardia, palpitations, syncope.

GI: Constipation; nausea; GI disturbances; anorexia.

MISC: Transient respiratory and circulatory depression after electroconvulsive therapy; agranulocytosis, thrombocytopenia, leukopenia (<1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *Postural hypotension*: Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Monitor vital signs.
- Blood dyscrasias are rarely reported; anticipate increased bleeding, infection, and poor healing.
- Place patient on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- Encourage daily plaque control procedures for effective self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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phenobarbital (fee-no-BAR-bih-tahl)

(phenobarbital sodium)

Bellatal, **Luminal Sodium**, **Solfoton**

Drug Class: Sedative and hypnotic; Barbiturate; Anticonvulsant

DEA Schedule: Schedule IV

PHARMACOLOGY

Action

Depresses sensory cortex; decreases motor activity; alters cerebellar function; and produces drowsiness, sedation, and hypnosis.

Uses

Short-term treatment of insomnia; long-term treatment of generalized tonic-clonic and cortical focal seizures; emergency control of acute convulsions; preanesthetic sedation.

Unlabeled Uses

Treatment of febrile seizures in children; treatment and prevention of hyperbilirubinemia in newborns; management of chronic cholestasis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Acetaminophen: Acetaminophen hepatotoxicity (mechanism unknown)

- Avoid concurrent use.

Clonazepam: Decreased clonazepam effect (increased metabolism)

- Monitor clinical status.

Metronidazole: Decreased metronidazole effect (increased metabolism)
- Avoid concurrent use.

Doxycycline: Decreased doxycycline effect (increased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS

CNS: Drowsiness; agitation; confusion; anxiety; headache; hyperkinesia; ataxia; CNS depression; paradoxical excitement; nightmares; psychiatric disturbances; hallucinations; insomnia; dizziness.

CVS: Bradycardia, hypotension, syncope (1%).

GI: Nausea; vomiting; constipation.

RESP: Hypoventilation; apnea; laryngospasm; bronchospasm.

MISC: Hypersensitivity reactions (e.g., angioedema, rashes, exfoliative dermatitis); fever; injection site reactions (e.g., local pain, thrombophlebitis).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Seizures*: Determine level of disease control, type and frequency of seizure, and compliance with medication regimen.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Monitor vital signs.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.

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phentermine HCl (FEN-ter-meen HIGH-droe-KLOR-ide)

Adipex-P, Ionamin, Obe-Nix 30, Phentermine HCl, Phentermine Resin

Ifa Reduccing S

Drug Class: CNS stimulant; Anorexiant

PHARMACOLOGY

Action

May stimulate satiety center in brain, causing appetite suppression.

Uses

Short-term (i.e., no longer than a few weeks) adjunct to diet plan to reduce weight.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Pilocarpine: Increased myopia (mechanism unknown)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; unpleasant taste.

CNS: Overstimulation; restlessness; dizziness; insomnia; euphoria; dysphoria; tremor; headache; psychotic episodes.

CVS: Palpitations; tachycardia; arrhythmias; cardiac valve disease; hypertension.

MISC: Bone marrow depression; agranulocytosis; leukopenia.

GI: Diarrhea; constipation.

RESP: Primary pulmonary hypertension.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Determine whether antibiotic prophylaxis is indicated before beginning dental treatment involving significant bleeding.
- *Antibiotic prophylaxis:* Inquire whether antibiotic was taken, when it was taken, and what dosage was taken; record in dental record.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- *Valvular heart disease:* Serious regurgitant cardiac valvular disease has been reported with concurrent use of phentermine and fenfluramine or dexfenfluramine. Determine whether the combination drug regimen was used; if so, has echocardiogram examination been completed to determine valve disease?

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and nonalcoholic oral health care products.
- *Antibiotic prophylaxis:* Inform patient that antibiotic needs to be taken 1 hr before dental appointment according to prescription instructions.

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phenylephrine hydrochloride (fen-ill-EFF-rin HIGH-droe-KLOR-ide)

AH-chew D, AK-Dilate, Alconefrin, Alconefrin 12, Alconefrin 25, Children's Nostril, Lusonal, Mydfrin 2.5%, Nasop, Neo-Synephrine, Nostril, Phenoptic, Rhinall, Sinex

 **Minims Phenylephrine, Novahistine Decongestant**

Drug Class: Arylalkylamine; Decongestant; Ophthalmic; Vasopressor used in shock

PHARMACOLOGY

Action

Stimulates postsynaptic alpha-receptors, resulting in rise in intense arterial peripheral vasoconstriction. Causes marked increase in systolic, diastolic, and pulmonary pressures as well as reflex bradycardia. Slightly decreases cardiac output and increases coronary blood flow.

Uses

Treatment of vascular failure in shock, shock-like states, drug-induced hypotension or hypersensitivity; correction of paroxysmal supraventricular tachycardia; prolongation of spinal anesthesia; vasoconstriction in regional analgesia; maintenance of adequate level of BP during spinal and inhalation anesthesia; temporary relief of nasal congestion and of minor eye irritations; pupil dilation in uveitis; treatment of open-angle glaucoma; use in diagnostic procedures (funduscopy) and before surgery.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Taste disturbance (nasal spray).
CVS: Reflex bradycardia; hypertension; angina; arrhythmias.
CNS: Headache; excitability; restlessness; tremor.

CLINICAL IMPLICATIONS

General

- Consider semisupine chair position to assist respiratory function.
- Monitor vital signs.

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phenytoin (FEN-ih-toe-in)

(phenytoin sodium)

Dilantin, Dilantin Infatab, Dilantin Kapseals, Dilantin-125

Dilantin-30 Pediatric

Epamin, Fenidantoin, Fenitron, Hydantoina

Drug Class: Anticonvulsant, hydantoin

PHARMACOLOGY

Action

Appears to act at motor cortex in inhibiting spread of seizure activity. Possibly works by promoting sodium efflux from neurons, thereby stabilizing threshold against hyperexcitability. Also decreases post-tetanic potentiation at synapse.

Uses

Control of grand mal and psychomotor seizures; prevention and treatment of seizures occurring during or after neurosurgery; control of grand mal type of status epilepticus (parenteral administration).

Unlabeled Uses

Control of arrhythmias (particularly cardiac glycoside-induced arrhythmias); control of convulsions in severe preeclampsia; treatment of trigeminal neuralgia (tic douloureux), recessive dystrophic epidermolysis bullosa, and junctional epidermolysis bullosa.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Acetaminophen: Possible increased acetaminophen toxicity (enzyme induction)
- Avoid concurrent use.

Fluconazole: Phenytoin toxicity (decreased metabolism)
- Avoid concurrent use.

Metronidazole: Possible phenytoin toxicity (decreased metabolism)
- Avoid concurrent use.

Doxycycline: Decreased doxycycline effect (increased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Gingival hyperplasia (30%); taste perversion.
CNS: Nystagmus; ataxia; dysarthria; slurred speech; mental confusion; dizziness; insomnia; transient nervousness; motor twitching; diplopia; fatigue; irritability; drowsiness; depression; numbness; tremor; headache; choreoathetosis (IV use).
GI: Nausea; vomiting; diarrhea; constipation.
RESP: Pharyngitis; sinusitis; cough.
MISC: Coarsening of facial features; lip enlargement; Peyronie disease; polyarthropathy; hyperglycemia; weight gain; chest pain; IgA depression; fever; photophobia; gynecomastia; periarteritis nodosa; pulmonary fibrosis; tissue injury at injection site; lymph node hyperplasia; hypothyroidism; photophobia; blood dyscrasias, some fatal.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine level of disease control, type and frequency of seizure, and patient's compliance with medication regimen.
- Place on frequent maintenance schedule to avoid periodontal inflammation associated with gingival hyperplasia.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Monitor vital signs.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- Encourage daily plaque control procedures for effective self-care. Strict plaque control may slow rate of gingival enlargement.

pilocarpine HCl (pie-low-CAR-peen HIGH-droe-KLOR-ide)

Salagen: Tablets: 5 mg
Adsorbocarpine, Akarpine, Isopto-Carpine, Pilocar, Pilopine HS, Piloptic-1, Piloptic-1/2, Piloptic-2, Piloptic-3, Piloptic-4, Piloptic-6, Pilostat

 **Minims-Pilocarpine**

 **Pilogrin**

Drug Class: Ophthalmic; Antiglaucoma; Mouth and throat product

PHARMACOLOGY

Action

OPHTHALMIC: Decreases intraocular pressure (IOP) by constricting pupil and stimulating ciliary muscles to open trabecular meshwork spaces and facilitate outflow of aqueous humor.
ORAL (PO): Stimulates exocrine glands including mucous cells of respiratory tract and salivary glands in oral cavity.

Uses

OPHTHALMIC: Treatment of chronic simple glaucoma, chronic angle-closure glaucoma, acute angle-closure glaucoma, pre- and postoperative management of intraocular tension, treatment of mydriasis.
ORAL (PO): Treatment of xerostomia in patients with malfunctioning salivary glands because of radiotherapy for cancer of head and neck, relief of dry mouth in patients with Sjögren syndrome.

Unlabeled Uses

Relief of dry mouth in patients with graft-vs-host disease (PO).

Contraindications

Hypersensitivity; conditions in which cholinergic effects such as constriction are undesirable. Oral use also contraindicated in uncontrolled asthma, acute iritis, narrow-angle glaucoma, acute inflammatory disease of anterior segment of eye.

Usual Dosage

ADULTS: *PO:* Titrate dosage based on therapeutic response and tolerance. To reduce the incidence and severity of side effects, use the lowest effective dose. Do not exceed a maximum of 10 mg/dose.

Radiation-induced xerostomia

ADULTS: *PO:* 5 mg tid. If no response, increase dose to 10 mg tid. Continue uninterrupted for at least 12 wk before assessing for full therapeutic benefit.

Sjögren syndrome

ADULTS: *PO:* 5 mg qid. Continue uninterrupted for at least 6 wk before assessing for full therapeutic benefit.

Pharmacokinetics

ABSORP: T_{max} is 0.85 to 1.25 hr. C_{max} is 15 to 41 ng/mL. AUC is 33 to 108 hr ng/mL. High-fat meals decrease the rate of absorption.

METAB: Limited information available; however, it is thought to occur at neuronal synapses and probably in plasma.

EXCRET: Urine (as unchanged pilocarpine, minimal active/inactive degradation products). $T_{1/2}$ is 0.76 to 1.35 hr.

ONSET: 20 min.

PEAK: 1 hr.

DURATION: 3 to 5 hr.

SPECIAL POP: *Gender:* Elderly women had C_{max} and AUC approximately twice that of elderly or young men.

DRUG INTERACTIONS

Sympathomimetic amines: Increased myopia (mechanism unknown)

- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Excessive salivation.

CVS: Transient hypertension; tachycardia; edema; palpitations.

MISC: OPHTH: Stinging, burning of eyes.

CNS: Chills; headache; dizziness; asthenia.

GI: Excessive salivation; nausea; vomiting; diarrhea dyspepsia; abdominal pain.

RESP: Bronchial spasm; pulmonary edema; rhinitis; sinusitis; pharyngitis; increased coughing; increased airway resistance; bronchial smooth muscle tone; bronchial secretions.

CLINICAL IMPLICATIONS

General

When prescribed by DDS:

- *Lactation:* Undetermined.
- *Children:* Safety and efficacy not established.
- *Elderly:* Elderly patients also may be at increased risk for certain adverse effects during therapy, including diarrhea, urinary frequency, and dizziness.
- *Special risk:* Use oral pilocarpine with caution in acute cardiac failure, bronchial asthma, peptic ulcer, hypertension, hyperthyroidism, retinal disease, GI or biliary tract spasm or obstruction, urinary tract obstruction, Parkinson disease, angina pectoris, MI, chronic bronchitis, chronic obstructive pulmonary disease, underlying psychiatric disorders.
- *Overdosage:* Salivation, lacrimation, nausea, vomiting, diarrhea, cramping, sweating, frequent urination, bradycardia, asystole, death (PO).

When prescribed by medical facility:

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Ophthalmic doseform:* Direct dental light out of patient's eyes and offer dark glasses for comfort.
- *PO doseform:* Monitor vital signs.

Pregnancy Risk Category: Category C.

Oral Health Education

When prescribed by DDS:

- Explain that long-term therapy may be required.
- Advise patients to drink additional water or noncaffeinated fluids during therapy.
- Tell patients using oral form to report the following symptoms to health care provider: sweating, nausea, nasal congestion, chills, flushing, frequent urination, dizziness, weakness, headache, indigestion, tearing, diarrhea, fluid retention.

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pimecrolimus (pim-eh-CROW-lih-muss)

Elidel

Drug Class: Immunomodulator, topical

PHARMACOLOGY

Action

Mechanism in atopic dermatitis is not known; however, pimecrolimus inhibits T-cell activation by blocking the transcription of early cytokines.

Uses

Short-term and intermittent long-term treatment of mild to moderate atopic dermatitis in nonimmunocompromised patients.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Headache.

GI: Gastroenteritis; upper abdominal pain; vomiting; diarrhea; nausea.

RESP: URI; pneumonia; bronchitis; aggravated asthma; sinus congestion; asthma; cough.

MISC: Bacterial infection; folliculitis; herpes simplex; chicken pox; pyrexia; flu-like symptoms; hypersensitivity; back pain; arthralgia; increased malignancies.

CLINICAL IMPLICATIONS

General

- *Viral infections:* The topical ointment may be associated with increased risk of varicella zoster virus infection (chicken pox or shingles), herpes simplex virus infection, or eczema herpeticum.
- This drug is associated with causing an increased risk for malignancies. Complete a thorough head and neck cancer examination.

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pindolol (PIN-doe-lahl)

Visken

Alti-Pindolol, APO-Pindol, Gen-Pindolol, Novo-Pindol, Nu-Pindol, PMS-Pindolol

Drug Class: Beta-adrenergic blocker

PHARMACOLOGY

Action

Nonselectively blocks beta receptors, which primarily affect heart (slows rate), vascular musculature (decreases blood pressure), and lungs (reduces function).

Uses

Management of mild to moderate hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

Sympathomimetic amines: Decreased antihypertensive effect with epinephrine (pharmacological antagonism)
- Monitor blood pressure. Use local anesthetic agents with vasoconstrictor with caution.

Hypertensive reactions with epinephrine (unopposed alpha-adrenergic stimulation)
- Monitor blood pressure. Use local anesthetic agents with vasoconstrictor with caution.

Decreased antianaphylactic effect of epinephrine (beta blockade)
- Increase epinephrine dosage may be required in anaphylaxis.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disturbance, taste loss.
CNS: Depression; visual disturbances; short-term memory loss; dizziness.
CVS: Hypotension; bradycardia; arrhythmia; postural hypotension.
MISC: Photosensitivity reactions.
GI: Nausea; vomiting; diarrhea.
RESP: Wheezing; bronchospasm; difficulty breathing (at higher doses).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- If GI side effects occur, consider semisupine chair position.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Beta blockers may mask epinephrine-induced signs and symptoms of hypoglycemia in patient with diabetes.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Place on frequent maintenance schedule to avoid periodontal inflammation.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

pioglitazone (pye-oh-GLI-ta-zone)

Actos

Drug Class: Antidiabetic, thiazolidinedione

PHARMACOLOGY

Action

Increases insulin sensitivity in muscle and adipose tissue and inhibits hepatic gluconeogenesis.

Uses

Patients with type 2 diabetes, as an adjunct to diet and exercise; may also be used in conjunction with a sulfonylurea, metformin, or insulin when diet, exercise, and a single agent alone does not result in adequate glycemic control in patients with type 2 diabetes mellitus.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Tooth disorder (unspecified) (5.3%).
CNS: Headache (9%).
RESP: URI (13%); sinusitis (6%).
MISC: Myalgia, edema (5%).

CLINICAL IMPLICATIONS

General

- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A_{1C} <7%. A_{1C} levels ≥8% indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated.
- Monitor blood pressure because hypertension and dyslipidemia (CAD) are prevalent in diabetes mellitus.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin or Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen; combination therapy with insulin or oral sulfonylureas can result in hypoglycemia.
- *Insulin or oral sulfonylurea drug combinations*: Observe for signs of hypoglycemia (e.g., confusion, argumentativeness, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- Ensure that patient has taken medication and eaten meal.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- Medical consult advised if fasting blood glucose is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- Place patient on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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pioglitazone hydrochloride/glimepiride (PYE-oh-GLI-tazone HYE-droe-KLOR-ide/glye-MEP-i-ride)

Duetact

Drug Class: Antidiabetic combination

PHARMACOLOGY

Action

PIOGLITAZONE: Increases insulin sensitivity; inhibits hepatic gluconeogenesis.
GLIMEPIRIDE: Stimulates insulin release from the pancreas; may decrease hepatic glucose production; increases sensitivity to insulin.

Uses

Adjunct to diet and exercise to improve glycemic control in patients with type 2 diabetes who are already treated with pioglitazone plus a sulfonylurea or whose diabetes is not ade-

quately controlled with a sulfonylurea alone, or who have initially responded to pioglitazone alone and require additional glycemic control.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole: Possible increased risk of hypoglycemia (decreased metabolism)
- Avoid concurrent use or monitor blood glucose.

ADVERSE EFFECTS

⚠ **ORAL:** Tooth disorder (5%, unspecified).
CVS: Combined edema/peripheral edema (7%).
CNS: Headache (7%).
GI: Diarrhea (6%); nausea.
RESP: Upper respiratory tract infection (16%).
MISC: Lower limb edema (12%); accidental injury (9%), hypoglycemia.

CLINICAL IMPLICATIONS

General

- Monitor blood pressure, as hypertension and dyslipidemia (CAD) are prevalent in diabetes mellitus. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin and Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Ensure patient has taken medication and eaten meal.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated; however, doxycycline therapy in patients with poorly controlled diabetes has been shown to improve disease control in the short term, and improve response following periodontal debridement.
- Medical consult advised if FBG is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- Observe for signs of hypoglycemia (e.g., confusion, argumentativeness, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.
- Encourage patient to follow daily plaque control procedures to reduce risk for oral inflammation.

pioglitazone hydrochloride/metformin hydrochloride (pye-oh-GLI-ta-zone HIGH-droe-KLOR-ide/met-FORE-min HIGH-droe-KLOR-ide)

ActosPlus Met

Drug Class: Antidiabetic combination

PHARMACOLOGY

Action

Rosiglitazone, a thiazolidinedione, increases insulin sensitivity in the liver, skeletal muscle, and adipose tissues. Metformin, a biguanide, decreases hepatic glucose production, decreases intestinal absorption of glucose, and improves insulin sensitivity by increasing peripheral glucose uptake and use.

Uses

Adjunct to diet and exercise to improve glycemic control in patients with type 2 diabetes who are already treated with pioglitazone plus metformin or whose diabetes is not adequately controlled with metformin alone, or for those patients who initially responded to pioglitazone alone and require additional glycemic control.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Dizziness, headache (at least 5%).
GI: Diarrhea, nausea (at least 5%).
RESP: Sinusitis, upper respiratory tract infection (at least 5%).
MISC: Edema/peripheral edema, lower limb edema (at least 5%).

CLINICAL IMPLICATIONS

General

- Monitor blood pressure, as hypertension and dyslipidemia (CAD) are prevalent in diabetes mellitus. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin and Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated; however, doxycycline therapy in patients with poorly controlled diabetes has been shown to improve disease control in the short term, and improve response following periodontal debridement.
- Medical consult advised if FBG is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.
- Encourage patient to follow daily plaque control procedures to reduce risk for oral inflammation.

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pirbuterol acetate (pihr-BYOO-tuh-role ASS-uh-TATE)

Maxair Autohaler

Drug Class: Bronchodilator; Sympathomimetic

PHARMACOLOGY

Action

Produces bronchodilation by relaxing bronchial smooth muscle through beta-2 receptor stimulation.

Uses

Prevention and treatment of reversible bronchospasm associated with asthma or other obstructive pulmonary diseases.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; throat irritation (unspecified); unpleasant taste.
CNS: Tremor; anxiety; confusion; fatigue; dizziness; nervousness; headache; weakness; hyperactivity/hyperkinesia/excitement; insomnia.
CVS: Palpitations; tachycardia.
GI: GI distress; diarrhea; nausea/vomiting.
RESP: Cough.
MISC: Flushing; anorexia/appetite loss; taste/smell change.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function. Uncontrolled disease characterized by wheezing and coughing.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Ensure that bronchodilator inhaler is present at each dental appointment.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible patients.
- Inhalants can dry oral mucosa; anticipate candidiasis, increased calculus, plaque levels, and increased caries.

Oral Health Education

- Rinse mouth with water after bronchodilator use to prevent dryness.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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piroxicam (pihr-OX-ih-kam)

Feldene

Alti-Piroxicam, Apo-Piroxicam, Gen-Piroxicam, Novo-Pirocam, Nu-Pirox

Androxicam, Artinor, Artyflam, Brexicam, Citoken, Dixonal, Dolzycam, Facicam, Flogosan, Osteral, Oxicanol, Piroxan, Piroxen, Rogal

Drug Class: Analgesic; NSAID

PHARMACOLOGY

Action

Decreases inflammation, pain, and fever, probably through inhibition of COX activity and prostaglandin synthesis.

Uses

Treatment of acute or long-term use of rheumatoid arthritis and osteoarthritis.

Unlabeled Uses

Symptomatic relief of primary dysmenorrhea, pain, sunburn, juvenile rheumatoid arthritis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, stomatitis, glossitis (<1%).

CNS: Headache; malaise; somnolence; vertigo; depression; insomnia; nervousness.

MISC: Anemia; increased bleeding time (1% to 10%); agranulocytosis; thrombocytopenia; leukopenia (<1%).

GI: Epigastric distress; nausea; vomiting; anorexia; constipation; stomatitis; abdominal discomfort; diarrhea; flatulence; abdominal pain; indigestion; toxicity (e.g., bleeding, ulceration, perforation); heartburn; dyspepsia; anorexia.

RESP: Bronchospasm; laryngeal edema; dyspnea; hemoptysis; shortness of breath.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Arthritis*: Consider patient comfort and need for semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias are rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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polyethylene glycol (peg) (poli-ETH-uh-leen GLI-cawl)

MiraLax

Drug Class: Bowel evacuant

PHARMACOLOGY

Action

Acts as an osmotic agent by causing water to be retained with the stool.

Uses

Treatment of occasional constipation; use should be limited to ≤14 days.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

GI: Nausea; abdominal bloating; cramping; flatulence; diarrhea; excessive stool frequency.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If GI side effects occur, consider semisupine chair position.

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posaconazole (POE-sa-KON-a-zole)

Noxafil

Drug Class: Antifungal

PHARMACOLOGY

Action

Blocks the synthesis of ergosterol, a key component of fungal cell membranes.

Uses

Prophylaxis of invasive *Aspergillus* and *Candida* infections in patients who are at high risk of developing these infections because of severe immunocompromise; treatment of oropharyngeal candidiasis refractory to itraconazole and/or fluconazole.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

Oral: Mucositis (17%); herpes simplex (15%); dry mouth, oral candidiasis (1%).
CVS: Hypertension (18%); hypotension (14%); tachycardia (12%); QT/QTc prolongation (4%).
CNS: Headache (28%); fatigue, insomnia (17%); dizziness (11%); anxiety (9%); weakness (8%); asthenia (2%); somnolence, tremor (1%).
GI: Diarrhea (42%); nausea (38%); vomiting (29%); abdominal pain (27%); constipation (21%); anorexia (15%); dyspepsia (10%); flatulence (1%).
RESP: Coughing (24%); dyspnea (20%); epistaxis (14%); upper respiratory tract infection (7%); pneumonia (3%).
MISC: Fever (45%); bacteremia (18%); leg edema (15%); cytomegalovirus infection (14%); edema (9%).

CLINICAL IMPLICATIONS

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Advise products for palliative relief of oral manifestations (stomatitis, mucositis, xerostomia, etc.)
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

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potassium products (poe-TASS-ee-uhm)

Cena-K, Effer-K, Gen-K, K + 10, K + 8, K + Care, K + Care ET, K Lyte, K Lyte DS, K Lyte/Cl, K Lyte/Cl 50, Kaon, Kaon Cl-10, Kaon-Cl, Kaon-Cl 20%, Kay Ciel, Kaylixir, K-Dur 10, K-Dur 20, K-G Elixir, K-Lor, Klor-Con, Klor-Con 10, Klor-Con 8, Klor-Con M10, Klor-Con M15, Klor-Con M20, Klor-Con/25, Klor-Con/EF, Klorvess, Klorvess, Klotrix, Kolyum, K-Tab, K-vescent Potassium Chloride, Micro-K Extencaps, Micro-K LS, Potasalan, Rum-K, Ten-K, Tri-K, Twin-K

APO-K, K-10 Solution, Kaoch, Kaochlor-20 Concentrate, K-Lor

Drug Class: Electrolyte

PHARMACOLOGY

Action

Major intracellular cation; essential in maintaining acid-base balance and isotonicity within cells. Functions in muscle contraction, nerve impulse transmission, gastric secretion, renal function, and metabolism.

Uses

Treatment of hypokalemia; prevention of potassium depletion in certain conditions. Parenterally, as prophylaxis or treatment of moderate to severe potassium loss when oral therapy is not adequate or feasible.

Unlabeled Uses
Treatment of thallium poisoning; with anticholinesterase agents in myasthenia gravis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
GI: Abdominal discomfort or distention; GI obstruction; bleeding; ulceration or perforation; nausea; vomiting; flatulence.
MISC: Hyperkalemia (symptoms may include paresthesia of extremities; listlessness; confusion; weak or heavy limbs; flaccid paralysis; hypotension; arrhythmias; heart block; cardiac arrest; prolonged QT interval; wide QRS complex; peaked T waves; ST depression).

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs.

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povidone iodine (POE-vih-dohn EYE-uh-dine)

Betadine: Aerosol: 5%; Gel (vaginal): 10%; Ointment: 10%; Skin cleanser, foam: 7.5%; Solution: 10%; Solution, swab aid: 10%; Solution, swab sticks: 10%; Surgical scrub: 7.5%
Betagen: Ointment: 1/5 available iodine; Solution: 10%; Surgical scrub: 7.5%
Biodine Topical: Solution: 1% iodine
Etodine: Ointment: 1% available iodine
Minidyne: Solution: 10%
Povidine: Ointment: 10%; Solution: 10%; Surgical scrub: 5.5%
Povidine-Iodine: Ointment: 10%; Liquid: 10%; Solution: 10%; Spray: 10%

Proviodine

Isodine, Yodine

Drug Class: Anti-infective, topical

PHARMACOLOGY
Action
Broad-spectrum antimicrobial agent.

Uses
Topical application for the treatment or prevention of infection with susceptible microorganisms.

Contraindications
Allergy to iodine.

Usual Dosage
Infection
Scrub, ointment, or solution
Adults and children: Apply as needed for treatment or prevention.

DRUG INTERACTIONS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Mucous membrane discoloration, irritation; taste disturbance.

CLINICAL IMPLICATIONS

General

- Assess patient for allergy to seafood; if reaction is positive, do not use.
- Do not apply to areas of rash, abrasion, or stomatitis due to risk of systemic absorption.
- Store in tight container; out of light.

Pregnancy Risk Category: Category D.

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pramipexole dihydrochloride (pram-ih-PEX-ole DIE-HIGH-droe-KLOR-ide)

Mirapex

Drug Class: Anti-Parkinson, non-ergot dopamine receptor agonist

PHARMACOLOGY

Action

Stimulates dopamine receptors in the corpus striatum, relieving parkinsonian symptoms.

Uses

Treatment of the signs and symptoms of idiopathic Parkinson disease. May be used in conjunction with L-dopa.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Dizziness; somnolence; headache; confusion; hallucinations; abnormal dreams; tremor; insomnia; aggravated Parkinson disease; dyskinesia; hypokinesia; hypesthesia; amnesia; extrapyramidal syndrome; abnormal thinking; hypertonia; akathisia; dystonia; delusions; paranoid reactions.

GI: Nausea (28%); dyspepsia; constipation (14%); anorexia; dysphagia.

RESP: Dyspnea; pneumonia.

MISC: Asthenia; edema; malaise; injury; fever; weight decrease; myoclonus.

CLINICAL IMPLICATIONS

General

- Extrapyramidal behaviors associated with Parkinson disease can complicate access to oral cavity and complicate oral procedures.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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pramlintide acetate (PRAM-lin-tide ASS-eh-tate)

Symlin

Drug Class: Amylin analog

PHARMACOLOGY

Action

Synthetic analog of the naturally occurring neuroendocrine hormone amylin. Amylin is co-located with insulin in pancreatic beta cells and is co-secreted with insulin in response to

food intake. Amylin slows gastric emptying, suppresses glucagon secretion, and regulates food intake by centrally mediated modulation of appetite.

Uses

As an adjunct treatment for type 1 diabetes in patients who use mealtime insulin therapy and who have failed to achieve desired glucose control despite optimal insulin therapy; as an adjunct treatment for type 2 diabetes in patients who use mealtime insulin therapy and who have failed to achieve desired glucose control despite optimal insulin therapy, with or without concurrent sulfonylurea and/or metformin therapy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Acetaminophen: Decreased effectiveness of acetaminophen (delayed absorption)

- Acetaminophen should be taken at least 1 hour before or 2 hours after pramlintide.

ADVERSE EFFECTS

GI: Abdominal pain, anorexia, nausea, vomiting (at least 5%).

RESP: Coughing (at least 5%).

CNS: Dizziness, fatigue, headache (at least 5%).

MISC: Allergic reaction, inflicted injury (at least 5%).

CLINICAL IMPLICATIONS

General

- Monitor blood pressure as hypertension and dyslipidemia (CAD) are prevalent in diabetes mellitus. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin and Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Ensure patient has taken medication and eaten meal.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated; however, doxycycline therapy in patients with poorly controlled diabetes has been shown to improve disease control in the short term and improve response following periodontal debridement.
- Monitor blood pressure as hypertension and dyslipidemia (CAD) are prevalent in diabetes mellitus.
- Medical consult advised if fasting blood sugar is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- Observe for signs of hypoglycemia (confusion, argumentative, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- If insulin is used, consider time of peak hypoglycemic effect.
- If GI side effects occur, consider semisupine chair position.
- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.
- Encourage patient to follow daily plaque control procedures to reduce risk for oral inflammation.

pravastatin sodium (PRUH-vuh-stuh-tin SO-dee-uhm)

Pravachol

Apo-Pravastatin, Nu-Pravastatin

Pravacol

Drug Class: Antihyperlipidemic; HMG-CoA reductase inhibitor

PHARMACOLOGY

Action

Increases rate at which body removes cholesterol from blood and reduces production of cholesterol in body by inhibiting enzyme that catalyzes early rate-limiting step in cholesterol synthesis.

Uses

As an adjunct to diet for reduction of elevated total and LDL cholesterol, apolipoprotein B, and triglyceride levels, and to increase HDL cholesterol in patients with primary hypercholesterolemia and mixed dyslipidemia (Frederickson types IIa and IIb); as adjunctive therapy to diet for treatment of patients with elevated serum triglyceride levels (Frederickson type IV); treatment of primary dysbetalipoproteinemia (Frederickson type III) in patients who do not respond adequately to diet; treatment for hypercholesterolemic patients without clinically evident coronary heart disease (CHD) to reduce risk of MI or CV mortality with no increase in death from noncardiovascular causes; treatment of patients with clinically evident CHD to reduce risk of total mortality by reducing coronary death, MI and those undergoing myocardial revascularization procedures, stroke, and stroke/transient ischemic attack and slow progression of coronary arteriosclerosis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Headache; dizziness.
CVS: Arrhythmia; palpitation; postural hypotension; syncope; vasodilation.
GI: Nausea; vomiting; diarrhea; abdominal pain; constipation; flatulence; heartburn; dyspepsia; pancreatitis.
RESP: Common cold; rhinitis; cough; influenza.
MISC: Localized pain; myalgia; myopathy; rhabdomyolysis; fatigue; paresthesia; peripheral neuropathy. An apparent hypersensitivity syndrome has been reported rarely that has included one or more of the following features: anaphylaxis; angioedema; lupus erythematous–like syndrome; polymyalgia rheumatica; vasculitis; purpura; thrombocytopenia; leukopenia; hemolytic anemia; positive antinuclear antibodies; increase in erythrocyte sedimentation rate; arthritis; arthralgia; urticaria; asthenia; photosensitivity; fever; chills; flushing; malaise; dyspnea; toxic epidermal necrolysis; erythema multiforme, including Stevens-Johnson syndrome.

CLINICAL IMPLICATIONS

General

- High LDL cholesterol concentration is the major cause of atherosclerosis, which leads to CAD (e.g., angina, MI); determine degree of CV health and ability to withstand stress of dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient, and use aspirating technique to prevent intravascular injection.

- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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prazosin HCl (PRAY-zoe-sin HIGH-droe-KLOR-ide)

Minipress

Alti-Prazosi, APO-Prazo, Novo-Prazin, Nu-Prazo

Minipres, Sinozzard

Drug Class: Antihypertensive; Antiadrenergic, peripherally acting

PHARMACOLOGY

Action

Selectively blocks postsynaptic alpha-1 adrenergic receptors, resulting in dilation of arterioles and veins.

Uses

Treatment of hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.
CNS: Depression; dizziness (10%); weakness (6.5%); nervousness; paresthesia; asthenia; drowsiness; headache.
CVS: Palpitations (5%); postural hypotension, hypotension, syncope (1% to 4%); tachycardia.
GI: Nausea (5%); vomiting (1% to 4%); diarrhea; constipation; abdominal discomfort or pain.
RESP: Dyspnea.
MISC: Arthralgia; edema; fever.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV condition. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient, and use aspiration technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Postural hypotension*: Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

prednisolone (pred-NISS-oh-lone)

(prednisolone tebutate, prednisolone sodium phosphate, prednisolone acetate)

Delta-Cortef, Econopred Plus, Flo-Pred, Pediapred, Pred Forte, Pred Mild, Predcor-50, Prednisol TBA

Minims Prednisolone, Novo-Prednisolone

Fisopred, Sophipren Ofteno

Drug Class: Corticosteroid

PHARMACOLOGY

Action

Intermediate-acting glucocorticoid that depresses formation, release, and activity of endogenous mediators of inflammation, including prostaglandins, kinins, histamine, liposomal enzymes, and the complement system; also modifies body's immune response.

Uses

ORAL/PARENTERAL ADMINISTRATION: Endocrine disorders: Rheumatic disorders; collagen diseases; dermatological diseases; allergic and inflammatory ophthalmic processes; respiratory diseases; hematological disorders; neoplastic diseases; edematous states caused by nephrotic syndrome; GI diseases; multiple sclerosis; tuberculous meningitis; trichinosis with neurological or myocardial involvement.

INTRA-ARTICULAR OR SOFT TISSUE ADMINISTRATION: Short-term adjunctive therapy of synovitis of osteoarthritis, rheumatoid arthritis, bursitis, acute gouty arthritis, epicondylitis, acute nonspecific tenosynovitis, post-traumatic osteoarthritis.

INTRALESIONAL ADMINISTRATION: Treatment of the following lesions: Keloids; localized hypertrophic, infiltrated, inflammatory lesions of lichen planus, psoriatic plaques, granuloma annulare, lichen simplex chronicus; discoid lupus erythematosus; necrobiosis lipoidica diabeticorum; alopecia areata; cystic tumors of aponeurosis or tendon.

OPHTHALMIC ADMINISTRATION: Treatment of steroid-responsive inflammatory conditions of palpebral and bulbar conjunctiva, lid, cornea, and anterior segment of globe.

Unlabeled Uses

Adjunctive therapy for tuberculous pleurisy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Increased risk of peptic ulcers (additive)
- Avoid concurrent use.

Midazolam: Possible decreased midazolam effect (Increased metabolism)
- Monitor clinical status.

Metronidazole: Possible decreased metronidazole effect (increased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Ulcerative esophagitis; masked infection; impaired wound healing.

CNS: Convulsions; pseudotumor cerebri (i.e., increased intracranial pressure with papilledema); vertigo; headache; neuritis; paresthesias; psychosis.

GI: Pancreatitis; abdominal distention; nausea; vomiting; increased appetite and weight gain; peptic ulcer with perforation and hemorrhage; small and large bowel perforation.

MISC: Musculoskeletal effects (e.g., weakness, myopathy, muscle mass loss, tendon rupture, osteoporosis, aseptic necrosis of femoral and humoral heads, spontaneous fractures); endocrine abnormalities (e.g., menstrual irregularities, cushingoid state, growth suppression in children, sweating, decreased carbohydrate tolerance, hyperglycemia, glycosuria, increased insulin or sulfonylurea requirements in diabetic patients, hirsutism); anaphylactoid or hypersensitivity reactions; aggravation or masking of infections; fatigue; insomnia. With intra-articular administration: osteonecrosis; tendon rupture; infection; skin atrophy; postin-

jection flare; hypersensitivity; facial flushing; hypokalemic syndrome (irregular heartbeat, muscle cramps, weakness).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Despite the anticipated perioperative physiological stress (i.e., minor surgical stress), patients undergoing dental care under local anesthesia should take only their usual daily glucocorticoid dose before dental intervention. No supplementation is justified.
- Anticipate oral candidiasis when steroids are used.
- Be aware that signs of bacterial oral infection may be masked and anticipate oral candidiasis.
- Place on frequent maintenance schedule to avoid periodontal inflammation.
- Anticipate addisonian or cushingoid complications affecting the head and neck area.
- Monitor blood pressure and pulse.
- Patient may be high-risk candidates for pathological fractures or jaw fractures during extractions.
- Monitor pulse characteristics.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.

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prednisone (PRED-nih-sone)

Deltasone: Tablets: 2.5, 5, 10, 20, 50 mg
Liquid Pred: Syrup: 5 mg/5 mL
Meticorten: Tablets: 1 mg
Orasone: Tablets: 1, 5, 10, 20, 50 mg
Panasol-S: Tablets: 1 mg
Prednicen-M: Tablets: 5 mg
Prednisone Intensol Concentrate: Oral solution: 5 mg/mL
Sterapred: Tablets: 5 mg
Sterapred DS: Tablets: 10 mg

Alti-Prednisone, Apo-Prednisone, Jaa Prednisone

Meticorten, Prednidib

Drug Class: Corticosteroid

PHARMACOLOGY

Action

Intermediate-acting glucocorticoid that depresses formation, release, and activity of endogenous mediators of inflammation, including prostaglandins, kinins, histamine, liposomal enzymes, and complement system. Also modifies body's immune response.

Uses

Endocrine disorders; rheumatic disorders; collagen diseases; dermatological diseases; allergic states; allergic and inflammatory ophthalmic processes; respiratory diseases; hematological disorders; neoplastic diseases; edematous states (because of nephrotic syndrome); GI diseases; multiple sclerosis; tuberculous meningitis; trichinosis with neurological or myocardial involvement.

Unlabeled Uses

COPD; Duchenne muscular dystrophy; Graves ophthalmopathy.

Contraindications

Systemic fungal infections; administration of live virus vaccines.

Usual Dosage

ADULTS: *PO:* 5 to 60 mg/day.

Pharmacokinetics

ABSORP: Rapid, almost complete.
DIST: Crosses placenta.
METAB: Mainly hepatic, also renal and in the tissue. Prednisone is inactive and rapidly metabolized to active prednisolone.
EXCRET: Renal. Plasma $t_{1/2}$ is 3.4 to 3.8 hr.
PEAK: 1 to 2 hr.
DURATION: 1.25 to 1.5 days.

DRUG INTERACTIONS

Albuterol or fenoterol: Hypokalemia (additive)
- Monitor vital signs.

Antacids: Decreased oral prednisone effect (decreased absorption)
- Administer as far apart as possible.

Bupropion: Increased risk of seizure (additive proconvulsant)
- Monitor clinical status.

Chlorambucil: Possible increased risk of seizure (additive proconvulsant)
- Monitor clinical status.

COX-1 inhibitors: Increased risk of peptic ulcer disease (additive)
- Avoid concurrent use.

Fluoroquinolones: Possible increased risk of Achilles tendon disorder (mechanism unknown)
- Assess risk/benefit.

Itraconazole or ketoconazole: Possible prednisone toxicity (decreased metabolism)
- Monitor clinical status.

Metronidazole: Decreased metronidazole effect (increased metabolism)
- Avoid concurrent use.

Omeprazole: Decreased prednisone effect (mechanism unknown)
- Monitor clinical status.

Rifampin: Marked decreased in prednisone effect (increased metabolism)
- Avoid concurrent use.

Thiazide diuretics: Increased potassium loss (additive)
- Monitor vital signs.

ADVERSE EFFECTS

⚠ **ORAL:** Ulcerative esophagitis; masked infection; impaired wound healing.
CVS: Thromboembolism or fat embolism; thrombophlebitis; necrotizing angiitis; cardiac arrhythmias or ECG changes; syncopal episodes; hypertension; myocardial rupture; CHF.
CNS: Convulsions; pseudotumor cerebri (increased intracranial pressure with papilledema); vertigo; headache; neuritis/paresthesias; psychosis.
GI: Pancreatitis; abdominal distention; nausea; vomiting; increased appetite and weight gain; peptic ulcer with perforation and hemorrhage; small and large bowel perforation.
MISC: Musculoskeletal effects (e.g., muscle weakness, steroid myopathy, muscle mass loss, tendon rupture, osteoporosis, aseptic necrosis of femoral and humeral heads, spontaneous fractures, including vertebral compression fractures and pathological fracture of long bones); endocrine abnormalities (e.g., menstrual irregularities, cushingoid state, growth suppression in children secondary to adrenocortical and pituitary unresponsiveness, increased sweating, decreased carbohydrate tolerance, hyperglycemia, glycosuria, increased insulin or sulfonylurea requirements in patients with diabetes, negative nitrogen balance because of protein catabolism, hirsutism); anaphylactoid/hypersensitivity reactions; aggravation or masking of infections; malaise; fatigue; insomnia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Anticipate oral candidiasis when steroids are used.

- Be aware that signs of bacterial oral infection may be masked and anticipate oral candidiasis.
- Place on frequent maintenance schedule to avoid periodontal inflammation.
- Anticipate addisonian or cushingoid complications affecting the head and neck area.
- Monitor blood pressure and pulse.
- Patient may be high-risk candidate for pathological fractures or jaw fractures during extractions.
- Monitor pulse characteristics.
- Despite the anticipated perioperative physiological stress (i.e., minor surgical stress), patients undergoing dental care under local anesthesia should take only their usual daily glucocorticoid dose before dental intervention. No supplementation is justified.

When prescribed by DDS:

- *Lactation:* Excreted in breast milk.
- *Elderly:* May require lower doses.
- *Hypersensitivity:* May occur, including anaphylaxis.
- *Renal failure:* Use with caution; monitor renal function.
- *Adrenal suppression:* Prolonged therapy may lead to HPA suppression.
- *Cardiovascular effects:* Use drug with great caution in patients who have suffered recent MI.
- *Hepatitis:* Drug may be harmful in patients with chronic active hepatitis positive for hepatitis B surface antigen.
- *Immunosuppression:* Do not administer live virus vaccines during treatment.
- *Infections:* May mask signs of infection. May decrease host-defense mechanisms to prevent dissemination of infection.
- *Ocular effects:* Use systemic drug cautiously in ocular herpes simplex because of possible corneal perforation.
- *Ophthalmic use:* Prolonged use may result in glaucoma, cataracts, or other complications.
- *Peptic ulcer:* May contribute to peptic ulceration, especially with large doses.
- *Stress:* Increased dosage of rapidly acting corticosteroid may be needed before, during, and after stressful situations.
- *Withdrawal:* Abrupt discontinuation may result in adrenal insufficiency.
- *Overdosage:* Cushingoid changes, moonfaced, striae, central obesity, hirsutism, acne, ecchymoses, hypertension, osteoporosis, myopathy, sexual dysfunction, diabetes mellitus, hyperlipidemia, peptic ulcer, GI bleeding, increased susceptibility to infection, electrolyte and fluid imbalance, psychosis.

Pregnancy Risk Category: Category C.

Oral Health Education

When prescribed by DDS:

- Advise patient to take single daily doses or alternate day doses in morning (before 9 AM) and to take multiple doses at evenly spaced intervals throughout day.
- Instruct patient to take medication with meals or snack to avoid GI irritation.
- Caution patient not to discontinue drug suddenly to avoid withdrawal syndrome. Explain that dosage will be tapered slowly (until 5 mg/day or less) before stopping.
- Warn patient to avoid people with known viral infections, particularly chickenpox or measles, and to inform health care provider if exposure occurs.
- Explain that patient should not receive live virus vaccinations.
- Instruct patients with diabetes to monitor blood glucose closely.
- Advise patient to notify health care providers of drug regimen before any surgical procedure, emergency treatment, immunization, or skin test.
- Tell patient to carry medical identification card at all times describing medication being taken.
- Tell patient about symptoms of adrenal insufficiency (e.g., fever, myalgia, malaise, anorexia, nausea, orthostatic hypotension, dizziness, fainting) and need to report these symptoms to health care provider immediately.
- Instruct patient to report the following symptoms to health care provider: black tarry stools, vomiting of blood, menstrual irregularities, unusual weight gain, swelling of lower extremities, puffy face, muscle weakness, prolonged sore throat, fever, or cold.

pregabalin (preh-GAB-ah-lin)

Lyrica

Drug Class: Anticonvulsant

PHARMACOLOGY

Action

Mechanism of pregabalin's antinociceptive and antiseizure effects is unknown. Effects may be related to high affinity binding to alpha2-delta site (an auxiliary subunit of voltage-gated calcium channels) in CNS tissue.

Uses

Management of neuropathic pain associated with diabetic peripheral neuropathy; adjunctive therapy for adults with partial-onset seizures; management of postherpetic neuralgia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Abnormal thinking, amnesia, anxiety, asthenia, ataxia, confusion, depersonalization, dizziness, euphoria, abnormal gait, headache, hypertonia, hypesthesia, incoordination, decreased libido, myoclonus, nervousness, neuropathy, nystagmus, paresthesia, somnolence, speech disorder, stupor, tremor, twitching, vertigo (at least 1%).

GI: Abdominal pain, constipation, flatulence, gastroenteritis, vomiting (at least 1%).

RESP: Bronchitis, dyspnea (at least 1%).

MISC: Accidental injury, allergic reaction, increased appetite, chest pain, face edema, flu-syndrome, infection, pain (at least 1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine level of disease control, type and frequency of seizure, and compliance with medication regimen.
- Place on frequent maintenance schedule to avoid periodontal inflammation.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.
- Determine need for power toothbrush for self-care.

P

prilocaine HCl (PRILL-oh-cane HIGH-droe-KLOR-ide)

Citanest Forte with Epinephrine: Injection: 4% with 1:200,000 epinephrine
Citanest Plain 4% Injection: Injection: 4% plain

Drug Class: Injectable local anesthetic; Amide

PHARMACOLOGY

Action

Inhibits sodium ion fluxes across membrane to block nerve action potential.

Uses

For local anesthesia by nerve block or infiltration in dental procedures.

Contraindications

Hypersensitivity to local anesthetics or any components of the products, para-aminobenzoic acid (esters only) or parabens; congenital or idiopathic methemoglobinemia; spinal

and caudal anesthesia in septicemia, existing neurological disease, spinal deformities, and severe hypertension, hemorrhage, shock, or heart block.

Usual Dosage

Local anesthesia in association with dental procedures

ADULTS AND CHILDREN: *IV:* 8 mg/kg of body weight not to exceed 600 mg.

Pharmacokinetics

METAB: Liver.
EXCRET: Kidney.
ONSET: 2 to 10 min.
DURATION: 2 to 4 hr.
SPECIAL POP: *Elderly:* Repeated doses may cause accumulation of the drug or its metabolites or slow metabolic degradation; give reduced doses.

DRUG INTERACTIONS

Intercurrent use: Mixtures of local anesthetics are sometimes employed to compensate for the slower onset of one drug and the shorter duration of action of the second drug. Toxicity is probably additive with mixtures of local anesthetics, but some experiments suggest synergisms. Exercise caution regarding toxic equivalence when mixtures of local anesthetics are employed. Some preparations contain vasoconstrictors. Keep this in mind when using concurrently with other drugs that may interact with vasoconstrictors
Sedatives: If employed to reduce patient apprehension during dental procedures, use reduced doses, since local anesthetics used in combination with CNS depressants may have additive effects. Give young children minimal doses of each agent.
Sulfonamides: The para-aminobenzoic acid metabolite of procaine inhibits the action of sulfonamides. Therefore, do not use procaine in any condition in which a sulfonamide drug is employed.
Trimethoprim-sulfamethoxazole: Methemoglobinemia (additive)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Trismus; tingling.
CNS: Convulsions, loss of consciousness (overdose).
CVS: Myocardial depression, cardiac arrest, dysrhythmias, bradycardia.
RESP: Status asthmaticus, respiratory arrest, anaphylaxis (allergy).
MISC: May produce dose-dependent methemoglobinemia. Although methemoglobin values of $<20\%$ do not generally produce any clinical symptoms, evaluate the appearance of cyanosis at 2 to 4 hr following administration in terms of the patient's overall status.

CLINICAL IMPLICATIONS

General

- *Lactation:* Safety for use during lactation has not been established.
- Use the lowest dosage that results in effective anesthesia to avoid high plasma levels and serious adverse effects. Inject slowly, with frequent aspirations before and during the injection, to avoid intravascular injection. Perform syringe aspirations before and during each supplemental injection in continuous (intermittent) catheter techniques. During the administration of epidural anesthesia, it is recommended that a test dose be administered initially and that the patient be monitored for CNS toxicity and cardiovascular toxicity, as well as for signs of unintended intrathecal administration, before proceeding.
- *Inflammation or sepsis:* Use local anesthetic procedures with caution when there is inflammation or sepsis in the region of proposed injection.
- *CNS toxicity:* Monitor cardiovascular and respiratory vital signs and state of consciousness after each injection. Restlessness, anxiety, incoherent speech, lightheadedness, numbness, and tingling of the mouth and lips, metallic taste, tinnitus, dizziness, blurred vision, tremors, twitching, depression, or drowsiness may be early signs of CNS toxicity.

- *Malignant hyperthermia:* Many drugs used during anesthesia are considered potential triggering agents for familial malignant hyperthermia. It is not known whether local anesthetics may trigger this reaction and the need for supplemental general anesthesia cannot be predicted in advance; therefore, have a standard protocol for management available.
- *Vasoconstrictors:* Use solutions containing a vasoconstrictor with caution and in carefully circumscribed quantities in areas of the body supplied by end arteries or having otherwise compromised blood supply (e.g., digits, nose, external ear, penis). Use with extreme caution in patients whose medical history and physical evaluation suggest the existence of hypertension, peripheral vascular disease, arteriosclerotic heart disease, cerebral vascular insufficiency, or heart block; these individuals may exhibit exaggerated vasoconstrictor response. Serious dose-related cardiac arrhythmias may occur if preparations containing a vasoconstrictor such as epinephrine are employed in patients during or following the administration of potent inhalation agents.

Pregnancy Risk Category: Category B.

Oral Health Education

- Advise the patient to exert caution to avoid inadvertent trauma to the lips, tongue, cheek, mucosae, or soft palate when these structures remain anesthetized. The ingestion of food should therefore be postponed until normal function returns.
- Advise the patient to consult the dentist if anesthesia persists or a rash develops.

primidone (PRIM-ih-dohn)

Mysoline

Apo-Primidone, Sertan

Drug Class: Anticonvulsant

PHARMACOLOGY

Action

Primidone and its metabolites (e.g., phenobarbital and phenylethylmalonamide) have anticonvulsant activity, raising seizure threshold and altering seizure patterns.

Uses

Control of grand mal, psychomotor, or focal epileptic seizures; may control grand mal seizures refractory to other anticonvulsants.

Unlabeled Uses

Treatment of benign familial tremor (essential tremor).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Ataxia; vertigo; fatigue; hyperirritability; emotional disturbances; drowsiness; personality deterioration; mood changes; paranoia.
GI: Nausea; anorexia; vomiting.
MISC: Granulocytopenia; agranulocytosis; megaloblastic anemia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine level of disease control, type and frequency of seizure, and compliance with medication regimen.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Blood dyscrasias are rarely reported; anticipate increased bleeding, infection, and poor healing.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education
- Encourage daily plaque control procedures for effective, nontraumatic self-care.

probenecid (pro-BEN-uh-sid)
Probenecid

Benuryl

Benecid

Drug Class: Uricosuric

PHARMACOLOGY
Action
Inhibits tubular reabsorption of urate, thus increasing urinary excretion of uric acid. Inhibits tubular secretion of most penicillin and cephalosporin antibiotics.

Uses
Treatment of hyperuricemia associated with gout and gouty arthritis; adjunctive therapy with penicillins or cephalosporins to elevate and prolong serum levels.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Acetaminophen: Possible acetaminophen toxicity (decreased metabolism)
- Avoid concurrent use.

COX-1 inhibitors: Possible COX-1 inhibitor toxicity (decreased excretion)
- Monitor clinical status.

Midazolam: Shortened induction of midazolam anesthesia (displacement from protein binding)
- Monitor clinical status.

ADVERSE EFFECTS
⚠ **ORAL:** Gingival pain.
CNS: Headaches; dizziness.
GI: Anorexia; nausea; GI distress; vomiting.
MISC: Hypersensitivity reactions; anaphylaxis; fever; flushing; exacerbation of gout; uric acid stones; costovertebral pain.

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Avoid prescribing aspirin products that antagonize probenecid.
- If GI side effects occur, consider semisupine chair position.
- *Gout*: Consider semisupine chair position for patient comfort.
- Patient may experience unilateral or bilateral TMJ pain (gouty arthritis) associated with acute exacerbation of gout.

procainamide HCl (pro-CANE-uh-mide HIGH-droe-KLOR-ide)
Pronestyl, Pronestyl-SR

Apo-Procainamide, Procan SR

Drug Class: Antiarrhythmic

PHARMACOLOGY
Action
Increases effective refractory period of atria and bundle of His-Purkinje system; reduces impulse conduction velocity and myocardial excitability in atria, Purkinje fibers, and ventricles.

Uses
Treatment of documented ventricular arrhythmias that are considered life threatening.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Bitter taste.
CNS: Dizziness; weakness; depression; psychosis with hallucinations.
GI: Nausea; vomiting; anorexia; abdominal pain.
MISC: Lupus erythematosus–like syndrome; blood dyscrasias (neutropenia, agranulocytosis, thrombocytopenia, hemolytic anemia).

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient, and use aspirating technique to prevent intravascular injection.
- Place patient on frequent maintenance schedule to avoid periodontal inflammation.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Blood dyscrasias are rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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prochlorperazine (pro-klor-PURR-uh-zeen)
Compazine, Compro

Apo-Prochlorazine, Nu-Prochlor, Stemetil

Drug Class: Antidopaminergic, Phenothiazine derivative

PHARMACOLOGY
Action
Effects apparently related to dopamine receptor blocking in CNS. Antiemetic activity may be caused by direct inhibition on medullary chemoreceptor trigger zone.

Uses
Treatment of schizophrenia; short-term treatment of generalized nonpsychotic anxiety; control of severe nausea and vomiting.

Unlabeled Uses
Treatment of migraines (IV).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Fluconazole: Possible QT prolongation (possible decreased metabolism or additive)
- Avoid concurrent use in high-risk patients.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth; tardive dyskinesia.
CVS: Orthostatic hypotension; hypertension; tachycardia; bradycardia, syncope; cardiac arrest; circulatory collapse; ECG changes.

CNS: Lightheadedness; faintness; dizziness; pseudoparkinsonism; dystonia; dyskinesia; motor restlessness; oculogyric crises; opisthotonos; hyperreflexia; drowsiness; headache; weakness; tremor; fatigue; slurring of speech; insomnia; vertigo; abnormalities of CSF proteins; paradoxical excitement or exacerbation of psychotic symptoms; catatonic-like states; paranoid reactions; lethargy; seizures; hyperactivity; nocturnal confusion; bizarre dreams.
GI: Nausea; vomiting; dyspepsia, adynamic ileus (which may result in death); constipation.
RESP: Laryngospasm; bronchospasm; dyspnea.
MISC: Increases in appetite and weight; polydipsia; increased prolactin levels; heat stroke.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several minutes at the end of the dental appointment before dismissing.
- Monitor vital signs.

Oral Health Education

- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.
- Evaluate manual dexterity. Determine need for power toothbrush for self-care.

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promethazine HCl (pro-METH-uh-zeen HIGH-droe-KLOR-ide)

Phenergan

Drug Class: Antihistamine; Antiemetic; Antivertigo

PHARMACOLOGY

Action

Competitively antagonizes histamine at H_1 receptor sites. Produces sedative and antiemetic effects.

Uses

ORAL/RECTAL: Temporary relief of runny nose and sneezing from common cold; symptomatic relief of perennial and seasonal allergic rhinitis, vasomotor rhinitis, allergic conjunctivitis, allergic and nonallergic pruritus, mild, uncomplicated skin manifestations of urticaria and angioedema; amelioration of allergic reactions to blood or plasma; treatment of dermographism; adjunctive therapy in anaphylactic reactions; preoperative, postoperative, obstetric sedation; prevention and control of nausea and vomiting associated with certain types of anesthesia and surgery; adjunctive therapy with analgesics for postoperative pain; sedation and relief of apprehension; induction of light sleep; active and prophylactic treatment of motion sickness.
INJECTION: Amelioration of allergic reactions to blood or plasma; adjunct to epinephrine and other standard measures after acute symptoms of anaphylaxis have been controlled; uncomplicated allergic conditions of the immediate type when other therapy is impossible or contraindicated; sedation and relief of apprehension and inducement of light sleep from which patient can be easily aroused; active treatment of motion sickness; prevention and control of nausea and vomiting associated with certain types of anesthesia and surgery; adjunct to analgesics for control of postoperative pain; preoperative, postoperative, and obstetric (during labor) sedation; intravenously in special surgical situations (e.g., repeated bronchoscopy, ophthalmic surgery, poor-risk patients with reduced amounts of meperidine or other narcotic analgesic as an adjunct to anesthesia and analgesia).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; tardive dyskinesia (dose related).

CNS: Drowsiness; sedation; dizziness; faintness; disturbed coordination; extrapyramidal effects (usually dose related and include three forms: pseudoparkinsonism, akathisia, dystonias); adverse behavioral effects; abnormal movements; hyperexcitability.

GI: Epigastric distress; nausea; vomiting; diarrhea; constipation.

RESP: Thickening of bronchial secretions; chest tightness; wheezing; respiratory depression; asthma; apnea.

MISC: Hypersensitivity reactions; photosensitivity; elevated prolactin levels; neuroleptic malignant syndrome; angioneurotic edema.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI or respiratory side effects occur, consider semisupine chair position.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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promethazine hydrochloride/ dextromethorphan hydrobromide (proe-METH-a-zeen HYE-droe-KLOR-ide/DEX-troe-meth-OR-fan HYE-droe-BROE-mide)

Promethazine with Dextromethorphan

Drug Class: Upper respiratory combination

PHARMACOLOGY

Uses

Temporary relief of coughs and upper respiratory tract symptoms associated with allergy or the common cold.

P

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CVS: Hypertension, hypotension.

CNS: Confusion, disorientation, dizziness, drowsiness, extrapyramidal symptoms, sedation, sleepiness.

GI: GI disturbances, nausea, vomiting.

RESP: Congestion.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.

- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- Monitor vital signs.
- Consider semisupine chair position for patient comfort.

Oral Health Education

- Dry mouth may occur; recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.
- *Extrapyramidal symptoms:* Monitor manual dexterity to determine if power toothbrush is needed.

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propafenone (proe-pa-FEEN-one)

Rythmol

Nistaken, Norfenon

Drug Class: Antiarrhythmic

PHARMACOLOGY

Action

Reduces fast inward current carried by sodium ion in the Purkinje fibers and, to a lesser extent, myocardial fibers.

Uses

IMMEDIATE RELEASE (IR): Prolong time to recurrence of paroxysmal atrial fibrillation/flutter or paroxysmal supraventricular tachycardia associated with disabling symptoms in patients without structural heart disease; treatment of ventricular arrhythmias (e.g., sustained ventricular tachycardia [VT]) that are life threatening.

EXTENDED RELEASE (ER): Prolong time to recurrence of symptomatic atrial fibrillation in patients with structural heart disease.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Lidocaine: CNS toxicity (additive)

- Minimize lidocaine dosage and monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Unusual taste (9%); dry mouth (2%).

CNS: Dizziness (13%); fatigue (6%); headache (5%); insomnia, anorexia, anxiety, ataxia (2%); drowsiness, tremor (1%).

CVS: AV block, first degree (4.5 %); conduction delay; palpitations.

GI: Nausea and vomiting (11%); constipation (7%); diarrhea, dyspepsia (3%); abdominal pain, cramps (2%); flatulence (1%).

MISC: Dyspnea (5%); edema, diaphoresis (1%); blood dyscrasias (agranulocytosis, thrombocytopenia, granulocytopenia, anemia); increased bleeding time.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias are rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

propantheline bromide (pro-PAN-thuh-leen BROE-mide)
Pro-Banthine

Propanthel

Drug Class: Anticholinergic; Antispasmodic

PHARMACOLOGY
Action
Exerts anticholinergic effects, resulting in GI smooth muscle relaxation and diminished volume and acidity of GI secretions.

Uses
Adjunctive therapy in treatment of peptic ulcer.

Unlabeled Uses
Treatment of secretory and spastic disorders of GI tract, biliary tract, urinary tract, and bladder.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth; altered taste perception.
CNS: Headache; flushing; nervousness; drowsiness; weakness; dizziness; confusion; insomnia; fever; mental confusion or excitement; restlessness; tremor.
CVS: Palpitations; bradycardia; tachycardia (high doses).
GI: Nausea; vomiting; dysphagia; heartburn; constipation; bloated feeling; paralytic ileus.
MISC: Suppression of lactation; decreased sweating; photophobia.

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Anticholinergics have strong xerostomic effects. Anticipate increased caries activity and candidiasis.
- Substernal pain (heartburn) may mimic pain of cardiac origin.
- Use COX inhibitors with caution because they may exacerbate PUD and GERD.
- Monitor vital signs.
- *Photophobia*: Direct dental light out of patient's eyes, and offer dark glasses for comfort.

Oral Health Education
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Consider frequent maintenance schedule.

propofol (PRO-puh-FOLE)
Diprivan: Injection: 10 mg/mL

Fresofol, Recofol

Drug Class: General anesthetic

P

PHARMACOLOGY

Action

Produces sedation/hypnosis rapidly (within 40 sec) and smoothly with minimal excitation; decreases intraocular pressure and systemic vascular resistance; rarely is associated with malignant hyperthermia and histamine release; suppresses cardiac output and respiratory drive.

Uses

Induction and maintenance of anesthesia in adults; induction anesthesia in children at least 3 yr old; maintenance anesthesia in pediatric patients at least 2 mo old; initiation and maintenance of monitored anesthesia care sedation in adults; sedation in intubated or respiratory-controlled adult ICU patients.

Contraindications

Situations in which general anesthesia or sedation are contraindicated.

Usual Dosage

Sedation

ADULTS UNDER 55 YR: *IV:* Initiation 100 to 150 mcg/kg/min (6 to 9 mg/kg/hr) for 3 to 5 min (preferred method) or slow injection of 0.5 mg/kg over 3 to 5 min; follow by maintenance infusion. For maintenance, use 25 to 75 mcg/kg/min (1.5 to 4.5 mg/kg/hr) (preferred method) or incremental bolus doses of 10 to 20 mg.
ELDERLY, DEBILITATED, OR ASA III/IV: *IV:* Initiation same as adults; not as rapid bolus. For maintenance, use 20% reduction of adult dose; avoid rapid bolus doses.

Pharmacokinetics

ABSORP: Rapidly and extensively distributed. Vd is approximately 60 L/kg (10-day infusion), highly lipophilic. Crosses blood brain barrier and placenta; distributes into breast milk. Protein binding is 95% to 99%.
METAB: Liver conjugation to inactive metabolites.
EXCRET: 50% of dose is excreted in the kidney (metabolites). Clearance is 23 to 50 mL/kg/min. Terminal $t_{1/2}$ is 1 to 3 days (10-day infusion). $T_{1/2}$ of rapid distribution is 2 to 4 min. $T_{1/2}$ of slower distribution is 30 to 64 min.
ONSET: Rapid onset, usually within 40 sec from start of injection.
DURATION: 3 to 5 min (single bolus).
SPECIAL POP: *Elderly:* With increasing age, the dosage requirement decreases because of occurrence of higher peak plasma concentrations.

DRUG INTERACTIONS

Atropine: Reduced heart rate (mechanism unknown)
- Monitor clinical status.

Midazolam: Prolonged midazolam effect (decreased metabolism)
- Monitor clinical status.

Clonidine: Possible propofol toxicity (additive)
- Decreased propofol dose and monitor clinical status.

Maprotiline: Possible increased risk of seizure (additive proconvulsant effect)
- Use with caution.

INCOMPATIBILITIES: For IV, do not mix with other therapeutic agents prior to administration. Avoid mixing blood or plasma in same IV catheter.

ADVERSE EFFECTS

CVS: Myocardial ischemia; hypotension; bradycardia; decreased cardiac output; hypertension (especially in children).
CNS: Amorous behavior; movement hypotonia; hallucinations; neuropathy; opisthotonos.
RESP: Apnea; cough; respiratory acidosis during weaning.
MISC: Asthenia; burning, stinging, or pain at injection site; fever.

CLINICAL IMPLICATIONS

General

When used by DDS:

- *Lactation:* Excreted in breast milk.
- *Special risk:* Use lower induction and maintenance doses in elderly, debilitated, and ASA III/IV patients, and monitor continuously for sign of hypotension or bradycardia. Use with caution in patients with lipid metabolism disorders, because propofol is an emulsion. Epileptic patients may be at risk of convulsions during recovery phase. Avoid significant decreases in mean arterial pressure and cerebral perfusion in patients with increased intracranial pressure or impaired cerebral circulation.
- *Anaphylaxis:* Has occurred rarely; relationship to drug has not been established.
- *Overdosage:* Cardiorespiratory and cardiovascular depression.

Pregnancy Risk Category: Category B.

Oral Health Education

- Advise patient that mental alertness, coordination, and physical dexterity may be impaired for some time after administration.

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propoxyphene HCl (pro-POX-ee-feen HIGH-droe-KLOR-ide)

Synonyms: propoxyphene; propoxyphene napsylate

Darvon Pulvules, Darvon-N

642

Drug Class: Narcotic analgesic

DEA Schedule: Schedule IV

PHARMACOLOGY

Action

Relieves pain by stimulating opiate receptors in CNS; also causes respiratory depression, peripheral vasodilation, inhibition of intestinal peristalsis, sphincter of Oddi spasm, stimulation of chemoreceptors that cause vomiting and increased bladder tone.

Uses

Relief of mild to moderate pain.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Alprazolam: Possible alprazolam toxicity (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Lightheadedness; dizziness; sedation; disorientation; incoordination; paradoxical excitement; hallucinations; euphoria; dysphoria; insomnia.

CVS: Hypotension; tachycardia; vasodilation; orthostatic hypotension.

GI: Nausea; vomiting; constipation; abdominal pain.

RESP: Depression of cough reflex.

MISC: Tolerance; psychological and physical dependence with chronic use; weakness.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- If oral pain requires additional analgesics, consider nonopioid products.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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propranolol HCl (pro-PRAN-oh-lahl HIGH-droe-KLOR-ide)

Inderal, Inderal LA, InnoPran XL, Propranolol Intensol

APO-Propranolol, Detensol, Nu-Propranolol

Inderalici

Drug Class: Beta-adrenergic blocker

PHARMACOLOGY

Action

Blocks beta receptors, primarily affecting the CV system (decreased heart rate, decreased cardiac contractility, decreased BP) and lungs (promotes bronchospasm).

Uses

Angina pectoris (except InnoPran XL); cardiac arrhythmias (except sustained release); essential tremor (except sustained release); hypertension; hypertrophic subaortic stenosis (except InnoPran XL); migraine prophylaxis (except InnoPran XL); MI (except sustained release); pheochromocytoma (except sustained release).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

Diazepam: Possible diazepam toxicity (decreased metabolism)
- Avoid concurrent used.

Lidocaine: Lidocaine toxicity (decreased metabolism)
- Minimize lidocaine dosage and monitor clinical status.

Sympathomimetic amines: Decreased antihypertensive effect with epinephrine (pharmacological antagonism)
- Monitor blood pressure. Use local anesthetic agents with vasoconstrictor with caution.

Hypertensive reactions with epinephrine (unopposed alpha-adrenergic stimulation)
- Monitor blood pressure. Use local anesthetic agents with vasoconstrictor with caution.

Decreased antianaphylactic effect of epinephrine (beta blockade)
- Increase epinephrine dosage may be required in anaphylaxis.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Bizarre dreams; decreased performance on neuropsychometric tests; depression; dizziness; emotional lability; fatigue; hallucinations; insomnia; lethargy; short-term memory loss; sleep disturbances; slightly clouded sensorium; tiredness; weakness.

CVS: Bradycardia; arrhythmia; chest pain; hypotension or hypertension; orthostatic hypotension.

GI: Dyspepsia; nausea; vomiting; diarrhea; epigastric distress; abdominal cramping; constipation; mesenteric arterial thrombosis; ischemic colitis.

RESP: Wheezing; dyspnea; bronchospasm; difficulty breathing.

MISC: Decreased exercise tolerance; hypersensitivity, including anaphylactic/anaphylactoid reactions; increased sensitivity to cold (e.g., Raynaud phenomenon); oculomucocutaneous reactions; pharyngitis; agranulocytosis; erythematous rash; fever; laryngospasm; respiratory distress; psoriasis-like eruptions; skin necrosis; systemic lupus erythematosus; blood dyscrasias (e.g., thrombocytopenia, leukopenia, agranulocytosis, anemia, others).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Postural hypotension*: Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Beta blockers may mask epinephrine-induced signs and symptoms of hypoglycemia in patients with diabetes.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias are rarely reported; anticipate increased bleeding, infection, and poor healing.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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propylthiouracil (pro-puhl-thigh-oh-YOU-rah-sill)

Synonym: PTU

Propyl-Thyracil

Drug Class: Antithyroid

PHARMACOLOGY

Action

Inhibits synthesis of thyroid hormones.

Uses

Long-term therapy of hyperthyroidism; amelioration of hyperthyroidism in preparation for subtotal thyroidectomy or radioactive iodine therapy; when thyroidectomy is contraindicated or not advisable.

Unlabeled Uses

Management of alcoholism-related liver disease.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Taste loss.

CNS: Paresthesias; neuritis; headache; vertigo; drowsiness; neuropathies; CNS stimulation; depression.

GI: Nausea; vomiting; epigastric distress.

MISC: Abnormal hair loss; arthralgia; myalgia; edema; lymphadenopathy; drug fever; interstitial pneumonitis; insulin autoimmune syndrome (hypoglycemia); hypoprothrombinemia, increased bleeding, agranulocytosis, leukopenia, granulocytopenia.

CLINICAL IMPLICATIONS

General

- Be aware that uncontrolled hyperthyroid disease poses a risk for cardiovascular events during dental treatment.
- Monitor blood pressure and pulse rate to determine degree of thyroid disease control.
- Use local anesthetic agents with a vasoconstrictor with caution. Thyroid hormones and epinephrine are synergistic; use aspiration technique.
- Blood dyscrasias are rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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pseudoephedrine (SUE-doe-eh-FED-rin)

Synonym: d-isoephedrine

Allermed, Cenafed, Children's Congestion Relief, Children's Silfedrine, Congestion Relief, Decofed Syrup, Defed-60, Dorcol Children's Decongestant, Dynafed Pseudo, Genaphed, Halofed, Mini Thin Pseudo, PediaCare Infant's Decongestant, PediaCare Nasal Decongestant, Pseudo, Pseudo-Gest, Seudotabs, Sinustop Pro, Sudafed, Sudafed 12 Hour Caplets, Sudex, Triaminic AM Decongestant Formula, Triaminic Infant Oral Decongestant Drops

Balminil Decongestant Syrup, Benylin Decongestant, Contac Cold 12 Hour Non-Drowsy, Eltor 120, Pseudofrin, Sudafed Decongestant 12 Hour, Sudafed Decongestant Children's, Sudafed Decongestant Extra Strength, Triaminic Pediatric

Lertamine-D

Drug Class: Nasal decongestant

PHARMACOLOGY

Action

Causes vasoconstriction and subsequent shrinkage of nasal mucous membranes by alpha-adrenergic stimulation, promoting nasal drainage.

Uses

Relief of nasal or eustachian tube congestion.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Pilocarpine: Increased myopia (mechanism unknown)

- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Nervousness; excitability; dizziness; tremor; insomnia; restlessness; depression.

CVS: Arrhythmia; tachycardia; palpitations; bradycardia; transient hypertension.

GI: Anorexia; nausea; vomiting.

MISC: Leukopenia; agranulocytosis; thrombocytopenia; photophobia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.

- Blood dyscrasias are rarely reported; anticipate increased bleeding, infection, and poor healing.
- Monitor for respiratory effects; consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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pyrazinamide (peer-uh-ZIN-uh-mide)

Pyrazinamide

Tebrazid

Braccoprial

Drug Class: Anti-infective; Antitubercular

PHARMACOLOGY

Action

Pyrazine analog of nicotinamide may be bacteriostatic or bactericidal against *Mycobacterium tuberculosis*.

Uses

Initial treatment of active tuberculosis in adults and selected children when combined with other antituberculosis agents.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

GI: Nausea; vomiting; anorexia.

MISC: Arthralgia and myalgia; hypersensitivity reactions (e.g., urticaria, pruritus); fever; thrombocytopenia; photosensitivity.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken (prevention or treatment). Consider implications of condition on dental treatment.
- Order complete medical consult to ensure noninfectious state exists before providing dental treatment.
- *For dental emergencies:* Follow special precautions to minimize disease transmission (particulate respirators) or refer patient to a hospital-based dental facility.
- Blood dyscrasias are rarely reported; anticipate increased bleeding.

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quetiapine fumarate (cue-TIE-ah-peen FEW-mah-rate)

Seroquel

Drug Class: Atypical antipsychotic

PHARMACOLOGY

Action

Has antipsychotic effects, apparently caused by dopamine and serotonin receptor blockade in the CNS.

Uses

Treatment of schizophrenia; short-term treatment of acute manic episodes associated with bipolar I disorder, as either monotherapy or adjunct therapy to lithium or divalproex.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (19%); tardive dyskinesia.

CNS: Somnolence (34%); headache (21%); agitation (20%); dizziness (11%); tremor (8%); anxiety (4%); hypertonia, dysarthria (≥1%).

CVS: Postural hypotension, hypotension, tachycardia (7%).

GI: Constipation (10%); abdominal pain (7%); vomiting (6%); dyspepsia (5%); gastroenteritis (2%); anorexia (≥1%).

RESP: Increased cough, dyspnea (≥1%); rhinitis (3%).

MISC: Asthenia (10%); pain (7%); back pain (5%); fever (2%); flulike syndrome (≥1%); leukopenia (>1%) anaphylaxis.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor blood pressure, pulse, and respiration.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *Postural hypotension*: Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- If blood dyscrasias are reported, anticipate increased infection and poor healing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Evaluate manual dexterity; consider need for power toothbrush.
- Encourage daily plaque control procedures for effective self-care.

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quinapril HCl (KWIN-uh-PRILL HIGH-droe-KLOR-ide)

Accupril

Acupril

Drug Class: Antihypertensive; Angiotensin-converting enzyme (ACE) inhibitor

PHARMACOLOGY

Action

Competitively inhibits angiotensin I-converting enzyme, resulting in prevention of angiotensin I conversion to angiotensin II, a potent vasoconstrictor that also stimulates aldosterone release. Clinical consequences are decreased BP, reduced sodium resorption, and potassium retention.

Uses

Treatment of hypertension; adjunctive therapy of CHF.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)

- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (1%).
CNS: Dizziness (8%); headache (6%); fatigue (3%).
CVS: Chest pain, hypotension (3%); tachycardia, palpitations, orthostatic hypotension (1%).
GI: Nausea, vomiting, diarrhea (2%); abdominal pain (1%).
RESP: Cough (4%).
MISC: Back pain (1%); angioedema (0.1%); anaphylactoid reactions.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient, and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Postural hypotension*: Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If coughing is problematic, consider semisupine chair position for treatment.
- Susceptible patient with DM may experience severe recurrent hypoglycemia.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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quinidine (KWIN-ih-deen)

(quinidine gluconate, quinidine polygalacturonate, quinidine sulfate)

Cardioquin, Quinaglute Dura-Tabs, Quinalan, Quinora

Apo-Quinidine, Biquin Durules

Quini Durules

Drug Class: Antiarrhythmic

PHARMACOLOGY

Action

Depresses myocardial excitability, conduction velocity, and contractility; prolongs effective refractory period and increases conduction time; has indirect anticholinergic effects; may decrease vagal tone at low doses, paradoxically increasing conduction through the AV node.

Uses

Treatment of premature atrial, atrioventricular junctional, and ventricular contractions; treatment of paroxysmal supraventricular tachycardia, paroxysmal atrioventricular junctional rhythm, atrial flutter, paroxysmal and chronic atrial fibrillation, and paroxysmal ventricular tachycardia not associated with complete heart block; maintenance therapy after electrical conversion of atrial fibrillation or flutter.
Quinidine Gluconate (IV Administration): Treatment of life-threatening *Plasmodium falciparum* malaria.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole or itraconazole: Possible quinidine toxicity (decreased metabolism)
- Avoid concurrent use.

Aspirin: Increased bleeding (additive antiplatelet effect)
- Avoid concurrent use.

Codeine: Absence of codeine analgesia (blocked conversion to morphine in rapid metabolizers)
- Monitor analgesic effect.

ADVERSE EFFECTS

CNS: Headache; fever; vertigo; excitement; confusion; delirium; syncope.

CVS: Arrhythmia; tachycardia; hypotension.

GI: Nausea; vomiting; anorexia; abdominal pain; diarrhea.

MISC: Lupus erythematosus–like syndrome; cinchonism (i.e., headache, tinnitus, nausea, photophobia, deafness, dizziness, vertigo, lightheadedness); hypersensitivity reactions; arthralgia; photosensitivity; myalgia; blood dyscrasias (e.g., acute hemolytic anemia, hypoprothrombinemia, thrombocytopenia, agranulocytosis, neutropenia, leukocytosis).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.
- Blood dyscrasias are rarely reported; anticipate increased bleeding, infection, and poor healing.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.

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quinine sulfate (KWIE-nine SULL-fate)

Quinine sulfate

Quinine-Odan

Drug Class: Anti-infective; Antimalarial

PHARMACOLOGY

Action

Causes pH elevation in intracellular organelles of parasites; also has skeletal muscle relaxant effects and cardiovascular effects similar to those of quinidine.

Uses

Treatment of chloroquine-resistant falciparum malaria; alternative treatment for chloroquine-sensitive strains of *P. falciparum*, *P. malariae*, *P. ovale*, and *P. vivax*.

Unlabeled Uses

Prevention and treatment of nocturnal recumbency leg cramps.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Vertigo; dizziness; headache; fever; apprehension; restlessness; confusion; syncope; excitement; delirium; hypothermia; seizures.

CVS: Anginal symptoms; syncope.

GI: Nausea; vomiting; diarrhea; epigastric pain.

MISC: Cinchonism (i.e., headache, tinnitus, nausea, diarrhea, disturbed vision, skin, CV and CNS symptoms at very high doses); hypersensitivity (i.e., rash, pruritus, flushing, sweating, facial edema, asthmatic symptoms).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor respiration, blood pressure, and pulse.

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rabeprazole sodium (ra-BE-pray-zole SO-dee-uhm)

AcipHex

Pariet

Drug Class: GI; Proton pump inhibitor

PHARMACOLOGY

Action

Suppresses gastric acid secretion by blocking acid (proton) pump within gastric parietal cells.

Uses

Short-term treatment in healing and symptomatic relief of duodenal ulcers and erosive or ulcerative GERD; maintaining healing and reducing relapse rates of heartburn symptoms in patients with GERD; treatment of daytime and nighttime heartburn and other symptoms associated with GERD; long-term treatment of pathological hypersecretory conditions, including Zollinger-Ellison syndrome and in combination with amoxicillin and clarithromycin to eradicate *Helicobacter pylori*.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole: Possible reduced ketoconazole effect (decreased absorption)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; mouth ulceration; stomatitis; gingivitis; glossitis; esophagitis.

CNS: Headache (2%); insomnia; anxiety; dizziness; depression; nervousness; somnolence; hypertonia; neuralgia; vertigo; convulsion; abnormal dreaming; decreased libido; neuropathology; paresthesia; tremor; delirium; disorientation.

GI: Diarrhea; nausea; abdominal pain; vomiting; dyspepsia; flatulence; constipation; eructation; gastroenteritis; rectal hemorrhage; melena; anorexia; dysphagia; increased appetite; abnormal stools; proctitis; colitis; pancreatitis; cholelithiasis; cholecystitis.

RESP: Dyspnea; asthma; epistaxis; laryngitis; hiccups; hyperventilation; interstitial pneumonia.

MISC: Asthenia; fever; allergic reaction; chills; malaise; substernal chest pain; neck rigidity; photosensitivity reaction; myalgia; arthritis; leg cramps; bone pain; arthrosis; bursitis; anaphylaxis; angioedema; coma; hyperammonemia; rhabdomyolysis; sudden death.

CLINICAL IMPLICATIONS

General

- If patient has GI disease, consider semisupine chair position.
- Use COX inhibitors with caution, they may exacerbate PUD and GERD.
- Drugs that lower acidity in intestinal tract may interfere with absorption of some antibiotics (penicillin, tetracyclines).
- Anticipate chemical erosion of teeth.
- Substernal pain (heartburn) may mimic pain of cardiac origin.

Oral Health Education

- Inform patient that toothbrushing should not be done after reflux, but to only rinse mouth with water, then use home fluoride product to minimize chemical erosion-related caries.

raloxifene hydrochloride (ral-OX-ih-FEEN HIGH-droe-KLOR-ide)

Evista

Drug Class: Selective estrogen receptor modulator

PHARMACOLOGY

Action

The biological actions of raloxifene are mediated largely through binding to estrogen receptors, which results in activation of certain estrogenic pathways and blockade of others. Raloxifene decreases resorption of bone and reduced biochemical markers of bone turnover to the premenopausal range. Effects on bone are manifested as reductions in the serum and urine levels of bone turnover markers, decreases in bone resorption based on radiocalcium kinetics studies, increases in bone mineral density, and decreases in incidence of fractures. Raloxifene also affects lipid metabolism, decreasing total and LDL cholesterol levels, but does not increase triglyceride levels or change total HDL cholesterol levels.

Uses

For the prevention and treatment of osteoporosis in postmenopausal women.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Migraine; depression; insomnia.

GI: Nausea; dyspepsia; vomiting; flatulence; gastroenteritis; abdominal pain.

RESP: Cough; pneumonia.

MISC: Infection; flu-like syndrome; leg cramps; chest pain; fever; weight gain; edema; arthralgia; myalgia; arthritis; hot flashes.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Patient may be at high risk for pathological fractures or jaw fractures during extractions.
- If GI side effects occur, consider semisupine chair position.

ramelteon (ram-EL-tee-on)

Rozerem

Drug Class: Melatonin receptor agonist

PHARMACOLOGY

Action

Melatonin receptor agonist with high affinity for melatonin MT_1 and MT_2 receptors and selectivity over the MT_3 receptor. Activation of MT_1 and MT_2 receptors is believed to contribute to ramelteon's sleep-promoting properties.

Uses
Treatment of insomnia characterized by sleep onset difficulty.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Fluconazole: Possible increased risk of ramelteon toxicity (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS
⚠ **ORAL:** Dysgeusia (2%).

CNS: Headache (7%); somnolence, dizziness (5%); fatigue (4%); exacerbated insomnia (3%); depression (2%).

GI: Nausea (3%); diarrhea.

RESP: Upper respiratory tract infection (3%); influenza (1%).

CLINICAL IMPLICATIONS
General
- If GI side effects occur, consider semisupine chair position.

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ramipril (ruh-MIH-prill)
Altace

Ramace, Tritace

Drug Class: Antihypertensive; Angiotensin-converting enzyme (ACE inhibitor)

PHARMACOLOGY
Action
Competitively inhibits angiotensin I–converting enzyme, resulting in prevention of angiotensin I conversion to angiotensin II, a potent vasoconstrictor. Clinical consequences include decrease in BP and indirect (by inhibiting aldosterone) decrease in sodium and fluid retention and increase in diuresis.

Uses
Treatment of hypertension; for otherwise stable patients who have demonstrated clinical signs of CHF within the first few days after sustaining acute MI; reduce risk of MI, stroke, or death from CV causes in patients at high risk.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
COX-1 inhibitors: Reduced antihypertensive effect (reduced prostaglandin synthesis)
- Monitor blood pressure.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth (<1%).

CNS: Dizziness (4%).

CVS: Hypotension (11%); orthostatic hypotension (2%).

GI: Nausea, vomiting (2%); diarrhea (1%).

RESP: Cough (8%).

MISC: Angioedema (0.3%); anaphylactoid reactions.

CLINICAL IMPLICATIONS
General
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.

- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- If coughing is problematic, consider semisupine chair position for treatment.
- Susceptible patient with DM may experience severe recurrent hypoglycemia.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- Place patient on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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ranitidine HCl (ran-EYE-tih-DEEN HIGH-droe-KLOR-ide)

Zantac, Zantac 75, Zantac EFFERdose

Alti-Ranitidine HCl, Apo-Ranitidine, Novo-Ranitidine, Nu-Ranit, PMS-Ranitidine, ratio-Ranitidine, Rhoxal-ranitidine

Drug Class: Histamine H_2 antagonist

PHARMACOLOGY

Action

Reversibly and competitively blocks histamine at H_2 receptors, particularly those in gastric parietal cells, leading to inhibition of gastric acid secretion.

Uses

Treatment and maintenance of duodenal ulcer; management of GERD (including erosive or ulcerative disease); short-term treatment of benign gastric ulcer; treatment of pathological hypersecretory conditions (Zollinger-Ellison).

Unlabeled Uses

Prevention of upper GI bleeding; treatment of aspiration pneumonia; stress ulcer; and gastric NSAID damage. Used as a part of a multidrug regimen to eradicate *Helicobacter pylori* in the treatment of peptic ulcer; protection against aspiration of acid during anesthesia; prevention of gastroduodenal mucosal damage that may be associated with long-term NSAIDs; to control acute upper GI bleeding; prevention of stress ulcers.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole or itraconazole: Reduced ketoconazole or itraconazole effect (decreased absorption)

- Avoid concurrent use.

Bupivacaine: Possible bupivacaine toxicity (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

CNS: Headache; somnolence; fatigue; dizziness; hallucinations; depression; insomnia.

GI: Nausea; vomiting; abdominal discomfort; diarrhea; constipation; pancreatitis.

MISC: Hypersensitivity reactions; thrombocytopenia; granulocytopenia; agranulocytosis.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If patient has GI disease, consider semisupine chair position.
- Drugs that lower acidity in intestinal tract may interfere with absorption of some antibiotics (e.g., penicillin, tetracyclines).

- Anticipate chemical erosion of teeth.
- Substernal pain (heartburn) may mimic pain of cardiac origin.
- Use COX inhibitors with caution, they may exacerbate PUD and GERD.

Oral Health Education

- Inform patient that toothbrushing should not be done after reflux, but to only rinse mouth with water, then use home fluoride product to minimize chemical erosion–related caries.

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ranolazine (RAY-no-lah-ZEEN)

Ranexa

Drug Class: Antianginal agent

PHARMACOLOGY

Action

Mechanism of action unknown. Ranolazine has antianginal and anti-ischemic effects that do not depend on reductions in heart rate or BP.

Uses

Treatment of chronic angina.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole: Increased ranolazine effect (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (<2%).

CVS: Palpitations (less than 2%); increased blood pressure.

CNS: Dizziness, headache (6%).

GI: Constipation, nausea (4%); abdominal pain, vomiting (less than 2%).

RESP: Dyspnea (less than 2%).

MISC: Peripheral edema (less than 2%).

CLINICAL IMPLICATIONS

General

- Patients taking this drug have significant CV disease. Medical consult to determine patient's ability to withstand stress of dental treatment is recommended.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- If GI side effects occur, consider semisupine chair position.
- Use cardiac dose of vasoconstrictor (no more than 2 cartridges of 1:100,000 or 4 cartridges of 1:200,000). Use aspirating technique to prevent intravascular injection.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patients with cardiovascular disease.
- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.

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rasagiline (ra-SA-ji-leen)

Azilect

Drug Class: Antiparkinson agent

PHARMACOLOGY

Action

Irreversible monoamine oxidase inhibitor (MAOI) suspected to increase extracellular levels of dopamine. Although rasagiline inhibits MAO type B, studies are inadequate to determine whether the drug is selective for MAO type B.

Uses

Treatment of signs and symptoms of idiopathic Parkinson disease.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Tramadol: Possible serotonin syndrome (additive serotonin effects)

- Avoid concurrent use.

Sympathomimetic amines: Severe hypertension and possible hypertensive crisis (increased storage and release of cathecholamines)

- Monitor vital signs.
- Use local anesthetic agent with a vasoconstrictor with caution.

ADVERSE EFFECTS

CVS: Angina pectoris, bundle branch block, syncope (at least 1%).

CNS: Headache (14%); depression (5%); malaise, paresthesia, vertigo (2%); hallucinations (1%); abnormal gait, anxiety, asthenia, decreased libido, dizziness, hallucinations, hyperkinesia, hypertonia, neuropathy, tremor (at least 1%).

GI: Dyspepsia (7%); gastroenteritis (3%); anorexia, diarrhea, GI hemorrhage, vomiting (at least 1%).

RESP: Asthma, increased cough (at least 1%).

MISC: Falling, flu syndrome (5%); fever (3%); allergic reaction, chest pain (at least 1%).

CLINICAL IMPLICATIONS

General

- Monitor vital signs.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Evaluate manual dexterity; determine need for power toothbrush for self-care.

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repaglinide (reh-PAG-lih-nide)

Prandin

GlucoNorm

Drug Class: Antidiabetic, meglitinide

PHARMACOLOGY

Action

Decreases blood glucose by stimulating insulin release from the pancreas.

Uses

Adjunct to diet and exercise to lower blood glucose in patients with type 2 diabetes mellitus whose hyperglycemia cannot be controlled by diet and exercise alone. Can be used with metformin or thiazolidinediones (such as rosiglitazone) when hyperglycemia cannot be controlled by exercise, diet, and monotherapy with metformin, sulfonylureas, repaglinide, or thiazolidinediones.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Clarithromycin: Increased risk of hypoglycemia (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Tooth disorder (unspecified) (2%).

CNS: Headache (11%).

CVS: Chest pain, angina (3%).

GI: Diarrhea, nausea (5%); dyspepsia (4%); constipation, vomiting (3%); pancreatitis.

RESP: URI (16%); sinusitis, bronchitis (6%).

MISC: Paresthesia (3%); allergy (2%).

CLINICAL IMPLICATIONS

General

- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated.
- Monitor blood pressure as hypertension and dyslipidemia (CAD) are prevalent in diabetes mellitus.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin or Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- *Loss of blood sugar control:* certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (such as corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Observe for signs of hypoglycemia (e.g., confusion, argumentative state, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- Ensure patient has taken medication and eaten meal.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- Medical consult advised if fasting blood glucose is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- *If insulin is used:* Consider time of peak hypoglycemic effect.
- If GI or respiratory side effects occur, consider semisupine chair position.
- Place patient on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.

ribavirin (rye-buh-VIE-rin)

Copegus, Rebetol, Virazole

Vilona, Vilona Pediatrica, Virazide

Drug Class: Anti-infective; Antiviral

PHARMACOLOGY

Action

Has antiviral inhibitory activity against respiratory syncytial virus (RSV), influenza virus, and herpes simplex virus. Exact mechanism is unknown.

Uses

AEROSOL: Treatment of carefully selected hospitalized infants and young children with severe lower respiratory tract infections caused by RSV.

CAPSULE: In combination with recombinant interferon alfa-2b injection for the treatment of chronic hepatitis C in patients with compensated liver disease previously untreated with alpha interferon or who have relapsed after alpha interferon therapy.

TABLET: In combination with peginterferon alfa-2a for the treatment of adults with chronic hepatitis C virus infection who have compensated liver disease and have not been previously treated with interferon alpha.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (4% to 7%, tablet or capsule, injection).

CNS: Headache, dizziness, insomnia, irritability, depression, emotional lability, impaired concentration, nervousness, fatigue (capsules).

GI: Nausea, anorexia, dyspepsia, vomiting (capsules).

RESP: Worsening of respiratory status, bacterial pneumonia, pneumothorax, apnea, ventilator dependence (aerosol); dyspnea (capsules).

MISC: Myalgia, arthralgia, musculoskeletal pain, rigors, fever, flu-like symptoms, asthenia, chest pain (capsules); neutropenia, thrombocytopenia (peg-interferon injection); anemia (capsule).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment. Coinfection with HIV and HBV may be present.
- This drug is used in combination with peg-interferon alpha-2a and adverse drug effects represent the drug combination.
- Consider medical consult to determine disease control and influence on dental treatment.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Consider semisupine chair position if respiratory side effects are present.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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riboflavin (RYE-boh-FLAY-vin)

Synonym: vitamin B2

Riboflavin

Drug Class: Vitamin

PHARMACOLOGY

Action

Converted in body to coenzyme necessary in oxidation reduction. Also necessary in maintaining integrity of RBCs.

Uses

Prevention and treatment of riboflavin deficiency.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

No adverse effects are reported with this drug; not toxic to humans due to limited absorption from GI tract.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.

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rifabutin (RIFF-uh-BYOO-tin)

Mycobutin

Drug Class: Anti-infective; Antitubercular

PHARMACOLOGY

Action

Inhibits DNA-dependent RNA polymerase in susceptible strains of bacteria.

Uses

Prevention of disseminated *Mycobacterium avium* complex disease in patients with advanced HIV infection.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Clarithromycin: Increased rifabutin toxicity (decreased metabolism) and decreased clarithromycin effect (increased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Discolored saliva, sputum; taste disturbance (3%).

CNS: Asthenia; headache; insomnia.

GI: Anorexia; diarrhea; dyspepsia; abdominal pain; eructation; flatulence; nausea; vomiting.

MISC: Myalgia; fever; discolored tears or skin; neutropenia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken (prevention or treatment). Consider implications of condition on dental treatment.
- Complete medical consult to ensure noninfectious state exists before providing dental treatment.
- *For dental emergencies:* Follow special precautions to minimize disease transmission (particulate respirators) or refer patient to a hospital-based dental facility.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased infection and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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rifampin (RIFF-am-pin)

Rifadin, Rimactane

Rofact

Pestarin, Rimactan

Drug Class: Anti-infective; Antitubercular

PHARMACOLOGY

Action

Inhibits DNA-dependent RNA polymerase in susceptible strains of bacteria.

Uses

Adjunctive treatment of tuberculosis; short-term management to eliminate meningococci from nasopharynx in *Neisseria meningitidis* carriers.

Unlabeled Uses

Treatment of infections caused by *Staphylococcus aureus* and *S. epidermidis*; treatment of gram-negative bacteremia in infancy; treatment of *Legionella*; management of leprosy; prophylaxis of *Haemophilus influenzae* meningitis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole, ketoconazole, or itraconazole: Decreased fluconazole, ketoconazole, or itraconazole effect (increased metabolism)

- Avoid concurrent use.

Diazepam, triazolam, or midazolam: Possible decreased oral or IV diazepam or triazolam and decreased oral triazolam effect (increased metabolism)

- Monitor clinical status.

Prednisone or prednisolone: Marked decreased in prednisone or prednisolone effect (increased metabolism)

- Avoid concurrent use.

Codeine: Possible decreased analgesia (mechanism unknown)

- Avoid concurrent use.

Doxycycline: Possible decreased doxycycline effect (increased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Sore mouth and tongue.

CNS: Headache; drowsiness; fatigue; dizziness; inability to concentrate; mental confusion; generalized numbness; behavioral changes; myopathy.

CVS: Decrease in blood pressure; shock.

GI: Heartburn; epigastric distress; anorexia; nausea; vomiting; gas; cramps; diarrhea; pseudomembranous colitis; pancreatitis.

RESP: Shortness of breath; wheezing.

MISC: Ataxia; muscular weakness; pain in extremities; osteomalacia; myopathy; menstrual disturbances; fever; elevations in BUN; elevated serum uric acid; possible immunosuppression; abnormal growth of lung tumors; reduced 25-hydroxycholecalciferol levels; edema of face and extremities; discoloration of body fluids; leukopenia, thrombocytopenia, hemolytic anemia (dose related).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken (prevention or treatment). Consider implications of condition on dental treatment.
- Complete medical consult to ensure noninfectious state exists before providing dental treatment.
- *For dental emergencies:* Follow special precautions to minimize disease transmission (particulate respirators) or refer patient to a hospital-based dental facility.
- Monitor vital signs.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

rifapentine (RIFF-ah-pen-teen)

Priftin

Drug Class: Anti-infective; Antitubercular

PHARMACOLOGY

Action

Inhibits DNA-dependent RNA polymerase in susceptible strains of *Mycobacterium tuberculosis*. Bactericidal for intracellular and extracellular *M. tuberculosis* organisms.

Uses

Treatment of pulmonary tuberculosis in conjunction with one or more other antituberculosis drugs to which the isolate is susceptible.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

The following adverse reactions were reported in patients receiving rifapentine combination therapy and occurred in at least 1% of the patients.

CNS: Headache; dizziness.

GI: Anorexia; nausea; vomiting; dyspepsia; diarrhea; hemoptysis.

MISC: Arthralgia; pain; hyperuricemia; blood dyscrasias (1.1% to 5%, leukopenia, neutropenia, thrombocytosis, anemia).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken (prevention or treatment). Consider implications of condition on dental treatment.
- Complete medical consult to ensure noninfectious state exists before providing dental treatment.
- *For dental emergencies:* Follow special precautions to minimize disease transmission (particulate respirators) or refer patient to a hospital-based dental facility.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

rimantadine HCl (rih-MAN-tuh-deen HIGH-droe-KLOR-ide)

Flumadine

Drug Class: Anti-infective; Antiviral

PHARMACOLOGY

Action

Inhibits viral replication cycle in various strains of influenza A virus.

Uses

ADULTS: Prophylaxis and treatment of infection caused by various strains of influenza A virus.

CHILDREN: Prophylaxis against influenza A virus.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disturbance.

CNS: Insomnia; dizziness; headache; nervousness; asthenia; impaired concentration.

GI: Nausea; vomiting; anorexia; abdominal pain.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment. Take precautions to avoid cross-contamination of microorganisms.

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risedronate sodium (riss-ED-row-nate SO-dee-uhm)

Actonel

Drug Class: Hormone; Bisphosphonate

PHARMACOLOGY

Action

Inhibits normal and abnormal bone resorption.

Uses

Treatment of osteoporosis in postmenopausal women; prevention of osteoporosis in postmenopausal women at risk of developing osteoporosis; prevention and treatment of glucocorticoid-induced osteoporosis in men and women; treatment of Paget disease of the bone.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Pharyngitis (5.8%).

CNS: Headache; dizziness.

CVS: Hypertension (10%), chest pain (2.5% to 5%).

GI: Diarrhea; abdominal pain; nausea; constipation; belching; colitis; dysphagia; esophagitis; esophageal ulcers; gastric ulcer.

RESP: Bronchitis.

MISC: Flu-like syndrome; chest pain; asthenia; neoplasm; arthralgia; bone pain; leg cramps; myasthenia; peripheral edema; anemia, ecchymosis (2.4% to 4.3%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Patient may be high-risk candidates for pathological fractures or jaw fractures during extractions.
- Osteonecrosis of the jaw is reported; consider this adverse drug effect when osteolytic disease is suspected or when surgical procedures are indicated.
- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.
- Prevention of oral disease is theorized to prevent osteonecrosis of jaw. Regular oral examination for oral disease is essential.

risperidone (RISS-PER-ih-dohn)

Risperdal, Risperdal Consta, Risperdal M-TAB

Drug Class: Atypical antipsychotic, benzisoxazole

PHARMACOLOGY

Action

Has antipsychotic effect, apparently caused by dopamine and serotonin receptor blocking in CNS.

Uses

Treatment of schizophrenia; short-term treatment of acute manic or mixed episodes associated with bipolar disorder (oral only) as either monotherapy or adjunct therapy to lithium or valproate.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Long-Acting Injection: Dry mouth (7%); toothache (3%); increased saliva, tooth disorder (2%).
Oral: Salivation (2%); dry mouth (1%); toothache (2%).

CNS: Long-Acting Injection: Headache (22%); insomnia (16%); dizziness (11%); parkinsonism (10%); akathisia (9%); hallucinations (7%); somnolence (6%); suicide attempts (4%); abnormal thinking, tremor (3%); abnormal dreaming, hypoesthesia (2%); agitation, anxiety, psychosis, depression, paranoid reaction, delusion, apathy, hypertonia, dystonia (≥1%).
Oral: Extrapyramidal symptoms (up to 34%); insomnia, agitation (26%); headache (22%); anxiety (20%); dizziness (11%); somnolence (8%); aggressive reaction (3%); increased dream activity, diminished sexual desire, nervousness, increased sleep duration (≥1%); sleepiness, increased duration of sleep, parkinsonism, extrapyramidal symptoms, asthenia, lassitude, increased fatigability (dose related); mania, Parkinson disease aggravation.

CVS: Tachycardia (3% to 5%).

GI: Long-Acting Injection: Dyspepsia, constipation, diarrhea (5%).
Oral: Constipation (13%); dyspepsia (10%); vomiting (7%); nausea (6%); abdominal pain (4%); anorexia, (≥1%); intestinal obstruction.

RESP: Coughing (5%); pharyngitis, upper respiratory tract infection, sinusitis (3%); dyspnea (1%); apnea, pulmonary embolism.

MISC: Long-Acting Injection: Pain (10%); leg pain, myalgia (4%); peripheral edema (3%); syncope (2%); fever (1%); arthralgia, skeletal pain, injection site pain, asthenia, chest pain (≥1%).
Oral: Chest pain, fever, arthralgia (3%); back pain (2%); increased prolactin levels; anaphylactic reaction; angioedema; pancreatitis; sudden unexpected death.

QR

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor respiration and pulse.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care.
- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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ritonavir (rih-TON-a-veer)

Norvir

Drug Class: Antiretroviral, protease inhibitor

PHARMACOLOGY

Action
Inhibits HIV protease, the enzyme required to form functional proteins in HIV-infected cells.

Uses
Treatment of HIV infections in combination with other antiretroviral agents.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Ketoconazole or itraconazole: Possible ritonavir, ketoconazole, or itraconazole toxicity (mutually decreased metabolism)
- Avoid concurrent use.

Diazepam, alprazolam, midazolam, or triazolam: Possible diazepam, alprazolam, midazolam, or triazolam toxicity (decreased metabolism)
- Monitor clinical status.

Clarithromycin: Increased toxicity (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS
⚠ **ORAL:** Circumoral paresthesia; throat irritation; taste perversion.

CNS: Headache; malaise; paresthesia; dizziness; insomnia; somnolence; abnormal thinking; depression; anxiety.

CVS: Syncope; vasodilation.

GI: Anorexia; constipation; diarrhea; dyspepsia; flatulence; nausea; vomiting; abdominal pain.

MISC: Asthenia; fever; myalgia.

CLINICAL IMPLICATIONS

General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values improve above this level.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Consider medical consult to determine disease control and influence on dental treatment.
- Anticipate oral candidiasis when HIV disease is reported.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care since HIV infection reduces host resistance.

rivastigmine tartrate (riv-vah-STIGG-meen TAR-trate)

Exelon

Drug Class: Cholinesterase inhibitor

PHARMACOLOGY

Action

Unknown; however, may increase acetylcholine by inhibiting acetylcholinesterase, thereby increasing cholinergic function.

Uses

Treatment of mild to moderate dementia of the Alzheimer type.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Taste loss.

CNS: Dizziness; headache; insomnia; confusion; depression; anxiety; somnolence; hallucination; tremor; aggression; vertigo; agitation; nervousness; delusion; paranoid reaction; abnormal gait; ataxia; paresthesia; convulsions.

CVS: Hypertension (3%).

GI: Nausea; vomiting; anorexia; diarrhea; dyspepsia; abdominal pain; constipation; hemorrhoids; flatulence; eructation; fecal incontinence; gastritis.

RESP: URI; bronchoconstriction.

MISC: Asthenia; accidental trauma; fatigue; malaise; flu-like syndrome; back pain; arthralgia; pain; bone fracture; infection; arthritis; leg cramps; myalgia; fever; edema; allergy; hot flashes; anemia; epistaxis; thrombocytopenia; leukocytosis.

CLINICAL IMPLICATIONS

General

- Patient may experience hypotension or hypertension. Monitor vital signs at each appointment; anticipate syncope.
- Ensure that caregiver is present at every dental appointment and understands informed consent.
- If GI or musculoskeletal side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Teach caregiver to assist patient with oral self-care practices.
- Evaluate manual dexterity; consider need for power toothbrush.

rizatriptan (rye-zah-TRIP-tan)

Maxalt, Maxalt-MLT

Maxalt RPD

Drug Class: Analgesic; Migraine

PHARMACOLOGY

Action

Binds to serotonin 1_B and 1_D receptors in intracranial arteries leading to vasoconstriction and subsequent relief of migraine headache.

Uses

Treatment of acute migraine attacks with or without aura.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Thirst, tongue edema; dry mouth (3%); dysgeusia; tightness, pain, or pressure of neck, throat, or jaw.

CNS: Dizziness (9%); somnolence (8%); paresthesia (4%); headache (2%); hypesthesia, decreased mental acuity, euphoria, tremor (≥1%).

CVS: Palpitation.

GI: Nausea (6%); diarrhea, vomiting (≥1%).

RESP: Dyspnea (≥1%).

MISC: Asthenia, fatigue (7%); atypical sensations (5%); pain, tightness, pressure, or heaviness of chest, localized pain (3%); regional tightness, pressure, or heaviness (2%); warm or cold sensations (≥1%); hypersensitivity (including angioedema), wheezing, or toxic epidermal necrolysis.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP and pulse). Drugs for prevention are sympatholytic; drugs for treatment of acute attack are sympathomimetic.
- This drug is taken to relieve symptoms of acute migraine attack. It is unlikely that dental treatment will be sought. Side effects are not lasting and should not complicate oral health care.

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ropinirole HCl (row-PIN-ih-role HIGH-droe-KLOR-ide)

Requip

Drug Class: Antiparkinson, non-ergot dopamine receptor agonist

PHARMACOLOGY

Action

Stimulates dopamine receptors in the corpus striatum, relieving parkinsonian symptoms.

Uses

Treatment of the signs and symptoms of idiopathic Parkinson disease. May be used in conjunction with L-dopa.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (5%); increased salivation (with dopamine).

CNS: Dizziness; somnolence; headache; confusion; hallucinations; abnormal dreams; tremor; anxiety; insomnia; aggravated Parkinson disease; hyperkinesia; hypokinesia; dyskinesia; paresthesia; vertigo; amnesia; impaired concentration.

CVS: Syncope (12%); orthostatic symptoms (6%), hypotension (2%); tachycardia; hypertension (5%); atrial fibrillation, extrasystoles.

GI: Nausea; vomiting; dyspepsia; constipation; abdominal pain; anorexia; diarrhea; flatulence; dysphagia.

RESP: Bronchitis; dyspnea; pneumonia.

MISC: Fatigue; viral infection; pain; asthenia; edema; chest pain; malaise; yawning; arthralgia; falls; injury.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Extrapyramidal behaviors associated with Parkinson disease can complicate access to oral cavity and complicate oral procedures.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Monitor blood pressure and pulse.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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rosiglitazone/glimepiride (roe-sih-GLIH-tah-sone/GLIE-meh-pei-ride)

Avandaryl

Drug Class: Antidiabetic combination

PHARMACOLOGY

Action

Rosiglitazone, a thiazolidinedione, increases insulin sensitivity in the liver, skeletal muscle, and adipose tissues. Glimepiride, a sulfonylurea, stimulates insulin release from functioning pancreatic beta cells.

Uses

Adjunct to diet and exercise to improve glycemic control in patients with type 2 diabetes who are already treated with rosiglitazone plus a sulfonylurea or whose diabetes is not adequately controlled with a sulfonylurea alone, or for those patients who initially responded to rosiglitazone alone and require additional glycemic control.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole: Possible increased risk of hypoglycemia (decreased metabolism)

- Avoid concurrent use or monitor blood glucose.

ADVERSE EFFECTS

CVS: ROSIGLITAZONE: CHF (postmarketing).

CNS: ROSIGLITAZONE: Headache (at least 5%).
GLIMEPIRIDE: Asthenia, dizziness, headache (2%).

GI: GLIMEPIRIDE: Nausea (1%).

RESP: ROSIGLITAZONE: Upper respiratory tract infection (at least 5%); pulmonary edema, pleural effusions (postmarketing).

MISC: ROSIGLITAZONE: Injury (at least 5%); edema (5%); angioedema (postmarketing).
GLIMEPIRIDE: Hepatic porphyria, disulfiram-like reactions (5%).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin and Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.

- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Ensure patient has taken medication and eaten meal.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated; however, doxycycline therapy in patients with poorly controlled diabetes has been shown to improve disease control in the short term, and improve response following periodontal debridement.
- Monitor blood pressure, as hypertension and dyslipidemia (CAD) are prevalent in diabetes mellitus.
- Medical consult advised if FBG is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- Observe for signs of hypoglycemia (e.g., confusion, argumentativeness, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.
- Encourage patient to follow daily plaque control procedures to reduce risk for oral inflammation.

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rosiglitazone maleate (roe-sih-GLIH-tah-sone MAL-ee-ate)

Avandia

Drug Class: Antidiabetic, thiazolidinedione

PHARMACOLOGY

Action

Increases insulin sensitivity; improves sensitivity to insulin in muscles, adipose tissue; inhibits hepatic gluconeogenesis.

Uses

Improves glycemic control of type 2 diabetes mellitus as monotherapy and as an adjunct to diet and exercise; in combination with metformin, insulin, or a sulfonylurea when diet, exercise, and a single agent does not result in adequate glycemic control in patients with type 2 diabetes mellitus.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Headache (6%); fatigue (4%).

GI: Diarrhea (2%).

RESP: URI (10%).

MISC: Injury (8%); edema (5%); back pain (4%).

POSTMARKETING: Adverse reactions potentially related to volume expansion (e.g., CHF, pulmonary edema, pleura effusions).

CLINICAL IMPLICATIONS

General

- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated.
- Monitor blood pressure as hypertension and dyslipidemia (CAD) are prevalent in diabetes mellitus.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin or Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (such as corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.
- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.

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rosiglitazone maleate/metformin HCl (roe-sih-GLIH-tah-sone MAL-ee-ate/met-FORE-min HIGH-droe-KLOR-ide)

Synonym: metformin HCl/rosiglitazone maleate

Avandamet

Drug Class: Antidiabetic combination, thiazolidinedione and biguanide

PHARMACOLOGY

Action

ROSIGLITAZONE: Increases insulin sensitivity.

METFORMIN: Decreases blood glucose by reducing hepatic glucose production, increases peripheral glucose uptake and utilization, and may decrease intestinal absorption of glucose.

Uses

As an adjunct to diet and exercise to improve glycemic control in patients with type 2 diabetes mellitus who are already treated with combination rosiglitazone and metformin or who are not adequately controlled on metformin alone.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Headache, fatigue (≥5%).

GI: Diarrhea (≥5%).

RESP: URI, pulmonary edema, pleural effusions (≥5%).

MISC: Injury, back pain, viral infection, arthralgia, edema (≥5%).

CLINICAL IMPLICATIONS

General

- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated.
- Monitor blood pressure as hypertension and dyslipidemia (CAD) are prevalent in DM.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin or Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (such as corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.
- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.

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rosuvastatin calcium (row-SEU-vah-stat-in KAL-see-uhm)

Crestor

Drug Class: Antihyperlipidemic; HMG-CoA reductase inhibitor

PHARMACOLOGY

Action

Inhibits HMG-CoA reductase, the rate-limiting enzyme that converts 3-hydroxy-3-methylglutaryl coenzyme A to mevalonate, a precursor of cholesterol.

Uses

As an adjunct to diet to reduce elevated total cholesterol (C), LDL-C, non–HDL-C, Apo B, and TG levels and to increase HDL-C in patients with primary hypercholesterolemia and mixed dyslipidemia; as an adjunct to diet for the treatment of patients with elevated serum triglyceride levels; to reduce LDL-C, total-C, and Apo B in patients with homozygous familial hypercholesterolemia as an adjunct to other lipid-lowering treatments or if such treatments are not available.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Periodontal abscess, tooth disorder (1%).

CNS: Headache (6%); dizziness, insomnia, hypertonia, paresthesia, depression (≥2%); anxiety, vertigo, neuralgia (≥1%).

CVS: Hypertension (≥2%).

GI: Diarrhea, dyspepsia, nausea (3%); constipation, gastroenteritis (≥2%); vomiting, flatulence, gastritis (≥1%).

RESP: Bronchitis, increased cough (≥2%); dyspnea, pneumonia, asthma (≥1%).

MISC: Back pain (3%); flu-like syndrome (2%); abdominal pain, accidental injury, chest pain, infection, pain (≥2%); pelvic pain, neck pain (≥1%).

CLINICAL IMPLICATIONS

General

- High LDL cholesterol concentration is the major cause of atherosclerosis which leads to CAD (angina, MI); determine degree of CV health and ability to withstand stress of dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- If GI or musculoskeletal side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.

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rotigotine (roe-TIG-oh-teen)

Neupro

Drug Class: Antiparkinson agent, dopaminergic

PHARMACOLOGY

Action

Stimulates dopamine D_2 receptors within the caudate-putamen in the brain; however, precise mechanism is unknown.

Uses

Treatment of signs and symptoms of early-stage idiopathic Parkinson disease.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (3%).

CVS: Hypertension (3%); purpura, syncope (at least 1%).

CNS: Somnolence (25%); dizziness (18%); headache, insomnia (14%); fatigue (8%); abnormal dreams (7%); hallucination, vertigo (3%); abnormal gait, ataxia, confusion, hypertonia, hypoesthesia, malaise, neuralgia, paresthesia (at least 1%).

GI: Nausea (48%); vomiting (20%); constipation (5%); dyspepsia (4%); anorexia.

RESP: Sinusitis (3%).

MISC: Accident (5%); abnormal vision (3%); fever (at least 1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Extrapyramidal behaviors can complicate performance of oral procedures.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- Assess manual dexterity. Determine need for power toothbrush for self-care.
- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.

salmeterol (sal-MEET-ah-rahl)

Serevent Diskus

Zamtirel

Drug Class: Bronchodilator; Sympathomimetic

PHARMACOLOGY

Action

Produces bronchodilation by relaxing bronchial smooth muscle through beta-2 receptor stimulation.

Uses

Maintenance treatment of asthma and prevention of bronchospasm with reversible obstructive airway disease; prevention of exercise-induced bronchospasm; maintenance treatment of bronchospasm associated with COPD (including emphysema and chronic bronchitis).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dental pain, oral candidiasis, throat dryness, irritation (1% to 3%).

CNS: Headache (28%); tremor (4%); dizziness/giddiness, nervousness, malaise/fatigue (3%); anxiety, insomnia, migraine, paresthesia, sleep disturbance (1% to 3%).

CVS: Increased blood pressure; palpitations; tachycardia.

GI: Diarrhea (5%); stomach ache (4%); nausea, viral gastroenteritis, vomiting, abdominal pain, dyspepsia, gastric pain, gastric upset, constipation, heartburn (1% to 3%).

RESP: URI (14%); bronchitis, cough, tracheitis (7%); lower respiratory infection, chest congestion (4%); asthma, common cold, influenza (3%); acute bronchitis, dyspnea, pneumonia, wheezing (1% to 3%); serious exacerbations of asthma (some fatal); laryngeal spasm; irritation or swelling (including stridor or choking); oropharyngeal irritation.

MISC: Influenza (5%); fever, body pain, chest discomfort, pain, edema, hyperglycemia, swelling (1% to 3%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse rate, respiratory rate and function); uncontrolled disease characterized by wheezing and coughing.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Ensure that bronchodilator inhaler is present at each dental appointment.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- If GI or respiratory side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

saquinavir mesylate (sack-KWIN-uh-vihr MEH-sih-LATE)

Invirase

Fortovase Roche

Drug Class: Antiretroviral, protease inhibitor

PHARMACOLOGY

Action

Inhibits HIV protease, the enzyme required to form functional proteins in HIV-infected cells.

Uses

Treatment of advanced HIV infection. Saquinavir is given in combination with nucleoside analogs (such as zidovudine).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole, ketoconazole, or itraconazole: Possible saquinavir toxicity (inhibition of P-glycoprotein; decreased metabolism)

- Avoid concurrent use.

Midazolam: Prolonged midazolam effect (decreased metabolism)

- Monitor clinical status.

Clarithromycin: Increased clarithromycin toxicity (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

CNS: Paresthesia; numbness; confusion; seizures; headache; depression; insomnia; anxiety; libido disorder.

GI: Diarrhea; abdominal pain and discomfort; nausea; dyspepsia; flatulence; vomiting; constipation; intestinal obstruction.

MISC: Ataxia; fatigue; pain weakness; ascites; pancreatitis; drug fever; intracranial hemorrhage; hemolytic anemia; thrombocytopenia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values are above this level.
- Consider medical consult to determine disease control and influence on dental treatment.
- Anticipate oral candidiasis when HIV disease is reported.
- Place on frequent maintenance schedule to avoid periodontal inflammation.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care since HIV infection reduces host resistance.

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scopolamine HBr (skoe-PAHL-uh-meen HIGH-droe-BRO-mide)

Synonym: hyoscine HBr

Isopto Hyoscine, Scopace

Transderm-V

Drug Class: Antiemetic; Antivertigo; Anticholinergic

PHARMACOLOGY

Action

Competitively inhibits action of acetylcholine at muscarinic receptors. Principal effects are on iris and ciliary body (pupil dilations and blurred vision), secretory glands (dry mouth), drowsiness, euphoria, fatigue, decreased nausea, and vomiting.

S

Uses
Accomplishment of cycloplegia and mydriasis for diagnostic procedures and for preoperative and postoperative states in treatment of iridocyclitis (ophthalmic use); prevention of nausea and vomiting associated with motion sickness (transdermal); preanesthetic sedation and obstetric amnesia in conjunction with analgesics and to calm delirium (parenteral).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth.

CNS: Drowsiness; disorientation; delirium.

RESP: Decreased respiratory rate.

MISC: Sensitivity to light.

CLINICAL IMPLICATIONS
General
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Direct dental light out of patient's eyes and offer dark glasses for comfort.

Oral Health Education
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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secobarbital sodium (see-koe-BAR-bih-tahl SO-dee-uhm)

Seconal Sodium Pulvules: Capsules: 100 mg

Drug Class: Controlled Substance: Schedule II; Canada G

PHARMACOLOGY
Action
Depresses sensory cortex; decreases motor activity; alters cerebellar function; and produces drowsiness, sedation, and hypnosis.

Uses
Short-term (up to 2-wk) treatment of insomnia; induction of basal hypnosis before anesthesia (parenteral form); sedation (parenteral form). Dentists should use the oral formulation only.

Unlabeled Uses
Control of status epilepticus or acute seizure episodes.

Contraindications
Hypersensitivity to barbiturates; history of addiction to sedative/hypnotic drugs; history of porphyria; severe liver impairment; respiratory disease with dyspnea; nephritic patients.

Usual Dosage
Insomnia

ADULTS: PO At bedtime 100 mg.

Hypnotic

ADULTS: IM 100 to 200 mg; IV 50 to 250 mg.

Sedation

ADULTS: PO 30 to 50 mg 3 or 4 times daily.

CHILDREN: PO/PR 2 to 6 mg/kg. For rectal administration, dilute to 1% to 1.5% solution.

Preoperative Sedation

ADULTS: PO 200 to 300 mg 1 to 2 h before surgery.
CHILDREN: PO 2 to 6 mg/kg (max, 100 mg) 1 to 2 h before surgery.

Sedation/Preanesthesia

ADULTS: IM (light sedation) 1 mg/kg 15 min before procedure.
CHILDREN: IM 4 to 5 mg/kg.

Convulsions

ADULTS: IM/IV 1.1 to 2.2 mg/kg. Max IV rate 50 mg/15 sec. Maximum adult IM dose 500 mg or 5 mL volume regardless of concentration.

Pharmacokinetics

ABSORP: Secobarbital absorption is rapid; the rate is increased if the sodium salt is ingested as a dilute solution or taken on an empty stomach.
DIST: Secobarbital has very high lipid solubility and high protein binding. The drug is distributed to all tissues and fluids, with high concentrations in the brain, liver, and kidneys.
METAB: Metabolism of secobarbital is primarily by the hepatic microsomal enzyme system.
EXCRET: Secobarbital is eliminated renally. The inactive metabolites are excreted as conjugates of glucuronic acid. The $t_{1/2}$ is 15 to 40 h (mean, 28 h).
ONSET: Secobarbital's onset of action is 10 to 15 min (PO).
DURATION: Secobarbital's duration of action is 3 to 4 h (PO).

DRUG INTERACTIONS

Clonazepam: Decreased clonazepam effect (increased metabolism)
- Monitor clonazepam concentration.

Doxycycline: Decreased doxycycline effect (increased metabolism)
- Avoid concurrent use; choose another antibacterial agent.

ADVERSE EFFECTS

CVS: Bradycardia; hypotension; syncope.
CNS: Drowsiness; agitation; confusion; headache; hyperkinesia; ataxia; CNS depression; paradoxical excitement; nightmares; psychiatric disturbances; hallucinations; insomnia; dizziness.
GI: Nausea; vomiting; constipation.
RESP: Hypoventilation; apnea; laryngospasm; bronchospasm.
MISC: Hypersensitivity reactions (e.g., angioedema, rashes, exfoliative dermatitis); fever; liver damage; injection site reactions (e.g., local pain, thrombophlebitis).

CLINICAL IMPLICATIONS

General

When prescribed by medical provider:
- Monitor vital signs. Consider management for hypotension following supine positioning.
- If GI side effects occur, consider semisupine chair position.

When used for sedation by DDS:
- Determine risk for allergy.
- Assess vital signs before and q 30 min after use as sedative.
- Observe respiratory dysfunction, respiratory depression, character, rate, rhythm. Hold drug if respirations are <10/min or if pupils are dilated.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several minutes at the end of the dental appointment before dismissing.
- Inform patient not to drive, sign important papers, or operate mechanical equipment while taking drug.
- Have someone drive patient to and from dental office when used for conscious sedation.
- Barbiturates induce liver microsomal enzymes; monitor effect on other drugs used.
- *Oral dose form:* Ensure patient knows how to take the drug, how long it should be taken, and to immediately report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset).
- *Children:* May respond with excitement rather than depression.
- *Elderly:* More sensitive to drug effects; dosage reduction is required.

- *Lactation:* Excreted in breast milk.
- *Renal failure:* Use drug with caution; dosage reduction may be required.
- *Hepatic failure:* Use drug with caution; dosage reduction may be required.
- *Monitor:* Obtain baseline Hct, Hgb, RBC, and LFT results (transaminase levels and bilirubin). Periodically evaluate those results if patient is on long-term therapy.
- *Dependence:* Tolerance or psychological and physical dependence may occur with continued use.
- *IV administration:* Do not exceed maximum IV rate 50 mg/15 sec; respiratory depression, apnea, and hypotension may result. Parenteral solutions are highly alkaline; extravasation may cause tissue damage and necrosis. Inadvertent intraarterial injection may lead to arterial spasm, thrombosis, and gangrene.
- *Seizure disorders:* Status epilepticus may result from abrupt discontinuation.
- *Overdosage:* CNS and respiratory depression, Cheyne-Stokes respiration, areflexia, oliguria, tachycardia, hypotension, lowered body temperature, coma, pulmonary edema, death.

Pregnancy Risk Category: Category D.

Oral Health Education

When prescribed by DDS:

- Explain that this medication may cause psychological and physical dependence. Emphasize that it is important not to increase dose without consulting health care provider.
- Discuss ways to facilitate sleep (quiet, darkened room; avoidance of caffeine and nicotine; warm bath, warm milk; deep breathing; relaxation; self-hypnosis).
- Inform patient that it may take a few doses to achieve noticeable sleep benefit.
- Instruct patient to notify health care provider immediately of sudden onset of fever, sore throat, bruising, rash, jaundice, or unusual bleeding (e.g., epistaxis).
- Instruct patient to avoid intake of alcoholic beverages or other CNS depressants (e.g., pain relievers, antihistamines, sedatives) to prevent serious CNS depression.
- Emphasize importance of follow-up evaluation with health care provider to monitor progress of therapy.
- Inform patient that after discontinuation of drug, nighttime sleeping might be disturbed for a few days and increased dreaming may occur.
- Advise patient that drug may cause daytime drowsiness and to use caution while driving or performing other tasks requiring mental alertness.
- Instruct patient not to discontinue medication abruptly without consulting health care provider.

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selegiline HCl (seh-LEH-jih-leen HIGH-droe-KLOR-ide)

Synonym: L-deprenyl

Carbex, Eldepryl, Emsam

 **Apo-Selegiline, Gen-Selegiline, Novo-Selegiline, Nu-Selegiline**

 **Niar**

Drug Class: Antiparkinson

PHARMACOLOGY

Action

Selective type B monoamine oxidase (MAO) inhibitor thought to increase dopaminergic activity. MAO enzyme breaks down catecholamines and serotonin. Selegiline may also interfere with dopamine reuptake at synapse.

Uses

Adjunct to levodopa/carbidopa in idiopathic Parkinson disease, postencephalitic parkinsonism/symptomatic parkinsonism.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Tramadol: Increased risk of serotonin syndrome (reduced reuptake of monoamines)
- Avoid concurrent use.

Sympathomimetic amines: Severe hypertension (additive)
- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Dizziness; lightheadedness; fainting; confusion; hallucinations; vivid dreams; headache; anxiety; tension; insomnia; lethargy; depression; loss of balance; delusions; dyskinesias; increased akinetic involuntary movements; bradykinesia; chorea.

CVS: Palpitations; orthostatic hypotension; hypotension and hypertension; arrhythmia, tachycardia and bradycardia.

GI: Nausea; abdominal pain; diarrhea.

MISC: Generalized ache; leg pain; low back pain; weight loss.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Extrapyramidal behaviors associated with Parkinson disease can complicate access to oral cavity and complicate oral procedures.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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selegiline transdermal (se-LEJ-i-leen)

Emsam

Drug Class: Antidepressant

PHARMACOLOGY

Action

Potentiation of monoamine neurotransmitter activity in the CNS resulting from inhibition of monoamine oxidase activity is suspected.

Uses

Treatment of major depressive disorder (MDD).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Tramadol: Increased risk of serotonin syndrome (reduced reuptake of monoamines)
- Avoid concurrent use.

Sympathomimetic amines: Severe hypertension and possible hypertensive crisis (increased storage and release of norepinephrine)
- Monitor vital signs.
- Use local anesthetic agents with a vasoconstrictor with caution.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (8%).
CVS: Orthostatic hypotension (10%); low systolic BP (3%); hypertension (at least 1%).
CNS: Headache (18%); insomnia (12%); abnormal thinking, agitation, amnesia, paresthesia (at least 1%).
GI: Diarrhea (9%); dyspepsia (4%); anorexia, constipation, flatulence, gastroenteritis, vomiting (at least 1%).
RESP: Sinusitis (3%); bronchitis, increased cough (at least 1%).
MISC: Chest pain, neck pain (at least 1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Monitor vital signs.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several minutes at the end of the dental appointment before dismissing.

Oral Health Education

- Encourage patient to follow daily plaque control procedures for nontraumatic, effective self-care.
- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.

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sertraline HCl (SIR-truh-leen HIGH-droe-KLOR-ide)

Zoloft

Apo-Sertraline, Novo-Sertraline, ratio-Sertraline

Altruline

Drug Class: Antidepressant

PHARMACOLOGY

Action

Selectively blocks reuptake of serotonin, enhancing serotonergic function.

Uses

Treatment of major depression; treatment of obsessions and compulsions in patients with obsessive-compulsive disorder (OCD), as defined in the DSM-III-R; treatment of panic disorder with or without agoraphobia, as defined in DSM-IV; posttraumatic stress disorder (PTSD); treatment of premenstrual dysphoric disorder, treatment of social anxiety disorder (social phobia).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Oxycodone: Possible increased risk of serotonin syndrome (mechanism unknown)
- Monitor clinical status.

Tramadol: Increased risk of seizure and/or serotonin syndrome (additive)
- Avoid concurrent risk.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; tooth disorder/caries; dysphagia.
CNS: Agitation; anxiety; nervousness; headache; insomnia; dizziness; tremor; fatigue; tingling; diminished sensation; twitching; hypertonia; decreased concentration; confusion;

somnolence; depression; decreased libido; agitation; emotional lability; vertigo; hypesthesia; apathy; hypokinesia/hyperkinesia; abnormal dreams; manic reaction.
CVS: Palpitations; chest pain.
GI: Nausea; diarrhea; anorexia; vomiting; flatulence; constipation; abdominal pain; increased appetite; dyspepsia; gastroenteritis; melena.
RESP: URI; pharyngitis; sinusitis; increased cough; dyspnea; bronchitis; rhinitis; epistaxis.
MISC: Muscle pain; weight loss or gain; myalgia; arthralgia; asthenia; fever; allergy/allergic reaction; chills; back pain; malaise; edema; yawning; photosensitivity; agranulocytosis; aplastic anemia; leukopenia; thrombocytopenia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Increased photosensitization with dental drugs having photosensitization side effect.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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sibutramine HCl (sih-BYOO-trah-meen HIGH-droe-KLOR-ide)

Meridia

Reductil

Drug Class: CNS stimulant; Anorexiant

PHARMACOLOGY

Action

Inhibits reuptake of norepinephrine, serotonin, and dopamine. May stimulate satiety center in brain, causing appetite suppression.

Uses

As an adjunct to a reduced calorie diet for the management of obesity, including weight loss and maintenance of weight loss. Recommended for patients with an initial body mass index >30 kg/m² or >27 kg/m² in the presence of other risk factors (e.g., hypertension, diabetes, dyslipidemia).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole or itraconazole: Possible sibutramine toxicity (decreased metabolism)
- Avoid concurrent use.

Sympathomimetic amines: Possible hypertension (additive)
- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Tooth disorder, thirst; dry mouth (17.2%); taste perversion.
CNS: Headache; migraine; dizziness; nervousness; anxiety; depression; paresthesia; somnolence; CNS stimulation; emotional lability; agitation; hypertonia; abnormal thinking; insomnia.
CVS: Hypertension; tachycardia, vasodilation, palpitation.

GI: Abdominal pain; anorexia; constipation; increased appetite; nausea; dyspepsia; gastritis; vomiting; rectal disorder; diarrhea; flatulence; gastroenteritis.
RESP: Cough; bronchitis; dyspnea.
MISC: Back, chest, or neck pain; flu-like syndrome; accidental injury; asthenia; allergic reactions; edema; arthralgia; myalgia; tenosynovitis; fever; leg cramps; ecchymosis, reduced platelet function.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment (e.g., hypertension, dyslipidemia, increased risk for diabetes).
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Anticipate increased bleeding, small risk of reduced platelet function.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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sildenafil citrate (sill-DEN-ah-fil SIGH-trayt)

Revatio, Viagra

Drug Class: Agent for impotence; Antihypertensive

PHARMACOLOGY

Action

Enhances the effect of nitric oxide by inhibiting phosphodiesterase type 5 in the corpus cavernosum of the penis. This results in vasodilation, increased inflow of blood into the corpora cavernosa, and ensuing penile erection upon sexual stimulation.

Uses

Treatment of impotence related to erectile dysfunction of the penis; treatment of pulmonary arterial hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Stomatitis, dry mouth, gingivitis (>2%).
CNS: Headache (16%); dizziness (2%); ataxia, hypertonia, neuralgia, paresthesia, tremor, vertigo, depression, insomnia, somnolence, migraine, neuropathy, abnormal dreams, decreased reflexes, hypesthesia (>2%); seizure, anxiety (postmarketing).
GI: Dyspepsia (7%); diarrhea (3%); vomiting, glossitis, colitis, dysphagia, gastritis, gastroenteritis, esophagitis, rectal hemorrhage (>2%).
RESP: Asthma, dyspnea, laryngitis, pharyngitis, sinusitis, bronchitis, increased sputum, increased cough (>2%).
MISC: Face edema, photosensitivity, shock, asthenia, pain, chills, accidental falls, abdominal pain, allergic reaction, chest pain, accidental injury (>2%).

CLINICAL IMPLICATIONS

General

- Concurrent administration with nitroglycerin may lead to severe hypotension. Avoid concurrent use.
- Monitor vital signs from cardiovascular effects.
- The short half-life of sildenafil reduces treatment related risks of the drug effects.

simvastatin (SIM-vuh-STAT-in)

Zocor

Drug Class: Antihyperlipidemic; HMG-CoA reductase inhibitor

PHARMACOLOGY

Action

Increases rate at which body removes cholesterol from blood and reduces production of cholesterol by inhibiting enzyme that catalyzes early rate-limiting step in cholesterol synthesis.

Uses

Adjunct to diet for reducing elevated total cholesterol and LDL cholesterol levels in patients with primary hypercholesterolemia (types IIa and IIb) when response to diet and other nonpharmacological measures alone are inadequate; to reduce the risk of stroke or transient ischemic attack.

Unlabeled Uses

Lower elevated cholesterol levels in patients with heterozygous familial hypercholesterolemia, familial combined hyperlipidemia, diabetic dyslipidemia in type 2 diabetic patients, hyperlipidemia secondary to nephrotic syndrome, and homozygous familial hypercholesterolemia in patients who have defective, rather than absent, LDL receptors.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole, ketoconazole, or itraconazole: Rhabdomyolysis (decreased metabolism)

- Avoid concurrent use.

Clarithromycin: Rhabdomyolysis (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Taste disturbance.

CNS: Headache; asthenia; paresthesia; peripheral neuropathy.

GI: Nausea; vomiting; diarrhea; abdominal pain; constipation; flatulence; dyspepsia; pancreatitis.

RESP: URI.

MISC: Myopathy; rhabdomyolysis; fatigue. Apparent hypersensitivity syndrome has been reported rarely that has included one or more of the following features: anaphylaxis; angioedema; lupus erythematous–like syndrome; polymyalgia rheumatica; vasculitis; purpura; thrombocytopenia; leukopenia; hemolytic anemia; positive antinuclear antibody; erythrocyte sedimentation rate increase; arthritis; arthralgia; urticaria; asthenia; photosensitivity; fever; chills; flushing; malaise; dyspnea; toxic epidermal necrolysis; erythema multiforme, including Stevens-Johnson syndrome.

CLINICAL IMPLICATIONS

General

- High LDL cholesterol concentration is the major cause of atherosclerosis which leads to CAD (angina, MI); determine degree of CV health and ability to withstand stress of dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.

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sirolimus (sir-OH-li-mus)

Rapamune

Drug Class: Immunosuppressive

PHARMACOLOGY

Action
Inhibits T-lymphocyte activation and proliferation that occurs in response to antigenic and cytokine stimulation; inhibits antibody production.

Uses
Prophylaxis of organ rejection in patients receiving renal transplants.

Unlabeled Uses
Treatment of psoriasis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Fluconazole: Possible sirolimus toxicity (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS
⚠ **ORAL:** Gingivitis, gingival hyperplasia, mouth ulceration, oral moniliasis, stomatitis (3% to less than 20%); angioedema.
CVS: Hypertension (49%); atrial fibrillation, CHF, hemorrhage, hypervolemia, hypotension, palpitation, peripheral vascular disorder, postural hypotension, syncope, tachycardia, thrombophlebitis, thrombosis, vasodilatation, venous thromboembolism including pulmonary embolism and deep venous thrombosis (3% to less than 20%).
CNS: Asthenia (40%); headache (34%); tremor (30%); insomnia (22%); anxiety, confusion, depression, dizziness, emotional lability, hypertonia, hypesthesia, hypotonia, malaise, neuropathy, paresthesia, somnolence (3% to less than 20%).
GI: Diarrhea (42%); constipation (38%); nausea (31%); dyspepsia, vomiting (25%); abnormal liver function tests, anorexia, dysphagia, eructation, esophagitis, flatulence, gastritis, gastroenteritis, ileus.
RESP: Dyspnea (30%); upper respiratory tract infection (26%); asthma, atelectasis, bronchitis, epistaxis, hypoxia, increased cough, lung edema, pleural effusion, pneumonia, rhinitis, sinusitis (3% to less than 20%); interstitial lung disease, sometimes fatal.
MISC: Abdominal pain (36%); pain (33%); chest pain (24%); abscess ascites, cellulitis, chills, enlarged abdomen, face edema, flu syndrome, generalized edema, hernia, herpes zoster infection, lymphocele, pelvic pain, peritonitis, sepsis (3% to less than 20%); anaphylactic/anaphylactoid reactions, hypersensitivity vasculitis.

CLINICAL IMPLICATIONS

General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- Immunosuppressant therapy reduces host response to infection.
- Be aware that signs of bacterial oral infection may be masked and anticipate oral candidiasis.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP ≥180/110.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several minutes at the end of the dental appointment before dismissing.

- Advise products for palliative relief of oral manifestations (stomatitis, mucositis, xerostomia, etc.)
- If GI side effects occur, consider semisupine chair position.
- Monitor for respiratory side effects; consider semisupine chair position.

Oral Health Education

- *Tremors:* Determine need for power toothbrush for self-care.
- Encourage daily plaque control procedures for effective self-care.

sitagliptin/metformin hydrochloride (sit-a-GLIP-tin/MET-fore-min HYE-droe-KLOR-ide)

Janumet

Drug Class: Antidiabetic combination

PHARMACOLOGY

Action

SITAGLIPTIN: Slows the inactivation of incretin hormones.
METFORMIN: Decreases hepatic glucose production, decreases intestinal absorption of glucose, and improves insulin sensitivity by increasing peripheral glucose uptake and utilization.

Uses

Adjunct to diet and exercise to improve glycemic control in adults with type 2 diabetes mellitus not adequately controlled on metformin or sitagliptin alone, or in patients already being treated with both of these agents.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Headache (at least 5%).

GI: Abdominal discomfort, diarrhea, flatulence, indigestion, nausea, vomiting (more than 5%); abdominal pain (1%).

MISC: Asthenia (more than 5%).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin and Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated; however, doxycycline therapy in patients with poorly controlled diabetes has been shown to improve disease control in the short term, and improve response following periodontal debridement.
- Monitor blood pressure, as hypertension and dyslipidemia (CAD) are prevalent in diabetes mellitus.
- Medical consult advised if FBG is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).

- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.
- Encourage patient to follow daily plaque control procedures to reduce risk for oral inflammation.

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sitagliptin phosphate (SI-ta-GLIP-tin FOS-fate)

Januvia

Drug Class: Antidiabetic agent

PHARMACOLOGY

Action

Sitagliptin is a dipeptidyl peptidase-4 inhibitor that is believed to act in type 2 diabetes by slowing the inactivation of incretin hormones.

Uses

Adjunct to diet and exercise in type 2 diabetes mellitus as monotherapy or in combination with metformin or a thiazolidinedione (e.g., rosiglitazone) when the single agent alone, with diet and exercise, does not provide adequate glycemic control.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Headache (at least 5%).
GI: Diarrhea (3%); nausea (1%).
RESP: Upper respiratory tract infection (at least 5%).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Insulin and Oral Hypoglycemic Agents" in Chapter 6: *Clinical Medicine*.
- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated; however, doxycycline therapy in patients with poorly controlled diabetes has been shown to improve disease control in the short term, and improve response following periodontal debridement.
- Monitor blood pressure, as hypertension and dyslipidemia (CAD) are prevalent in diabetes mellitus.
- Medical consult advised if FBG is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.

Pregnancy Risk Category: Category B.

Oral Health Education

- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.
- Encourage patient to follow daily plaque control procedures to reduce risk for oral inflammation.

sodium fluoride (SO-dee-uhm FLUR-ide)

Synonym: fluoride sodium

ACT: OTC Rinse: 0.02% (from 0.05% sodium fluoride)
Denta 5000 Plus: Cream: 1.1%
DentaGel 1.1%: Gel: 1.1%
EtheDent: Cream: 1.1%; Tablets, Chewable: 0.25 mg, 0.5 mg (from 1.1 mg sodium fluoride), 1 mg (from 2.2 mg sodium fluoride)
Fluoride: Tablets: 1 mg (from 2.2 mg sodium fluoride)
Fluoride Loz: Lozenges: 1 mg (from 2.2 mg sodium fluoride)
Fluorigard: Rinse: 0.02% (from 0.05% sodium fluoride)
Fluorinse: Rinse: 0.09% (from 0.2% sodium fluoride)
Fluoritab: Drops: 0.25 mg per drop (from ~ 0.275 mg sodium fluoride); Tablets, Chewable: 0.5 mg (from 1.1 mg sodium fluoride)
Flura: Tablets: 1 mg (from 2.2 mg sodium fluoride)
Flura-Loz: Lozenges: 1 mg (from 2.2 mg sodium fluoride)
Gel-Kam: Gel: 0.1% (from 0.4% stannous fluoride); Rinse: 0.04%
Gel-Tin: Gel: 0.1% (from 0.4% stannous fluoride)
Karidium: Tablets, chewable: 1 mg (from 2.2 mg sodium fluoride)
Karigel, Karigel-N: Gel: 0.5% (from 1.1% sodium fluoride)
Luride: Drops: 0.5 mg per mL (from 1.1 mg sodium fluoride); Gel: 1.2% (from sodium fluoride and hydrogen fluoride)
Luride Lozi-Tabs: Tablets, Chewable: 0.25 mg, 0.5 mg (from 1.1 mg sodium fluoride), 1 mg (from 2.2 mg sodium fluoride)
Luride-SF Lozi-Tabs: Tablets, Chewable: 1 mg (from 2.2 mg sodium fluoride)
MouthKote F/R: Rinse: 0.04%
NeutraGard Advanced: Gel: 1.1%
Pediaflor: Drops: 0.5 mg per mL (from 1.1 mg sodium fluoride)
Pharmaflur, Pharmaflur df: Tablets, Chewable: 1 mg (from 2.2 mg sodium fluoride)
Pharmaflur 1.1: Tablets, Chewable: 0.5 mg (from 1.1 mg sodium fluoride)
Phos-Flur: Solution: 0.2 mg per mL (from 0.44 mg sodium fluoride)
Point-Two: Rinse: 0.09% (from 0.2% sodium fluoride)
PreviDent: Gel: 0.5% (from 1.1% sodium fluoride)
PreviDent Plus: Gel: 1.2% (from sodium fluoride and hydrogen fluoride)
PreviDent 5000 Plus: Cream: 1.1%
PreviDent Rinse: Rinse: 0.2% neutral sodium fluoride
Sodium Fluoride: Drops: 0.125 mg per drop (from ~ 0.275 mg sodium fluoride), 0.5 mg per mL (from 1.1 mg sodium fluoride); Tablets, Chewable: 0.25 mg, 1 mg (from 2.2 mg sodium fluoride)
Stannous Fluoride: Gel: 0.4%; Rinse concentrate: 0.63%
Stop: Gel: 0.1% (from 0.4% stannous fluoride)
Thera-Flur, Thera-Flur-N: Gel-Drops: 0.5% (from 1.1% sodium fluoride)

Drug Class: Dental anticaries agent

PHARMACOLOGY

Action

Combines with hydroxyapatite to form fluorapatite, which is less soluble in acidic environment.

Uses

For prevention of dental caries.

Unlabeled Uses

Sodium fluoride may be effective in treating osteoporosis. Doses (as fluoride) up to 60 mg daily or more are used in conjunction with calcium supplements, vitamin D, or estrogen. However, large doses may result in a higher frequency of side effects. Some data suggest that doses <50 mg/day are efficacious with fewer adverse reactions. No commercially available products contain high sodium fluoride doses for this use; therefore, a large number of tablets would be required to obtain this dosage. Fluoride supplementation is not recommended for the prophylaxis of osteoporosis due to the potential for increased incidence of fractures.

Contraindications

When the fluoride content of drinking water exceeds 0.7 ppm; low sodium or sodium-free diets; hypersensitivity to fluoride.

Do not use 1-mg tablets in children younger than 3 yr old or when the drinking water fluoride content is 0.3 ppm or higher. Do not use 1-mg/5-mL rinse (as a supplement) in children younger than 6 yr old.

Usual Dosage

Prevention of dental caries

SOLUTION, GEL (CREAM), OR TABLET (2.2 mg of sodium fluoride is equivalent to 1 mg of fluoride ion)

ADULTS: *Dental rinse or gel (cream):* Rinse or brush with 10 mL daily and spit out after use.

CHILDREN: *Oral (tablets or drops)*

Fluoride in drinking water <0.3 ppm
- YOUNGER THAN 6 MO OF AGE: None
- 6 MO TO 3 YR: 0.25 mg
- 3 YR TO 6 YR: 0.5 mg
- OLDER THAN 6 YR: 1.0 mg

Fluoride in drinking water 0.3 to 0.7 ppm
- Younger than 6 mo: None
- 6 MO TO 3 YR: 0.125 mg
- 3 YR TO 6 YR: 0.25 mg
- OLDER THAN 6 YR: 0.5 mg

CHILDREN AGES 6 TO 12: *Dental rinse or gel (cream):* Rinse or brush with 5 to 10 mL daily and spit out after rinsing or brushing.

Pharmacokinetics

ABSORP: Well absorbed.

DIST: Distributed to calcified tissues (bone and enamel).

EXCRET: Urine, feces, breast milk; crosses placenta.

DRUG INTERACTIONS

Antacids (magnesium-, aluminum-, and calcium-containing formulations): Decreased efficacy of fluoride (decreased absorption)
- Avoid concurrent use.

Milk: Decreased efficacy of fluoride (decreased absorption)
- Avoid concurrent use.

ADVERSE EFFECTS

Oral: Mottled enamel (overdose).
MISC: Gastric distress; headache; weakness. Rinses and gels containing stannous fluoride may produce surface staining of the teeth; this does not occur with nonstannous fluoride topical preparations. Acidulated fluoride may dull porcelain and composite restorations.
ACUTE OVERDOSE: Back tarry stools, bloody vomitus, diarrhea, decreased respiration, increased salivation, watery eyes.
CHRONIC OVERDOSE: Hypocalcemia, tetany, respiratory arrest, constipation, loss of appetite, nausea, vomiting, weight loss.

CLINICAL IMPLICATIONS

General

- Follow manufacturer's instructions for application; tell patient not to swallow fluoride.
- Determine fluoride concentration in water supply, then calculate dosage.
- The use of fluoride supplements is not recommended when community drinking water contains at least 0.6 ppm fluoride or in children older than age 16 yr.
- Recommended doses should not be exceeded because dental fluorosis and osseous changes may occur.
- To reduce risk of accidental overdosage, ADA recommends that a limit of 264 mg sodium fluoride be dispensed in prepackaged containers.
- Tablets may be chewed; do not swallow whole; may be given with juice.
- *Tablets and drops:* Milk and other dairy products may decrease absorption of sodium fluoride; avoid simultaneous ingestion.
- Monitor children using gel or rinse; not to be swallowed.

Pregnancy Risk Category: No information available.

Oral Health Education

- *Rinses and gels:* Rinses and gels are most effective immediately after brushing or flossing and just prior to sleep. Expectorate any excess. Do not swallow. Do not eat, drink, or rinse mouth for 30 min after application.
- Notify dentist if tooth enamel becomes discolored.
- Tell parent to store product out of children's reach to prevent excessive ingestion.

Treatment of acute overdose:

- Gastric lavage with calcium chloride or calcium hydroxide solution.
- Maintain high urine output.
- Take child to hospital emergency room.

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sotalol HCl (SOTT-uh-lahl HIGH-droe-KLOR-ide)

Betapace AF, Betapace

Sotacor, Rhoxal-sotalol, ratio-Sotalol, PMS-Sotalol, Nu-Sotalol, Novo-Sotalol, Gen-Sotalol, Apo-Sotalol

Drug Class: Beta-adrenergic blocker

PHARMACOLOGY

Action

Blocks beta receptors, which primarily affect heart (slows rate), vascular musculature (decreases blood pressure), and lungs (reduces function).

Uses

BETAPACE: Management or prevention of life-threatening ventricular arrhythmias.
BETAPACE AF: Maintenance of normal sinus rhythm in patients with highly symptomatic atrial fibrillation/atrial flutter.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

Sympathomimetic amines: Decreased antihypertensive effect (pharmacological antagonism)
- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disturbance; mouth ulceration.
CNS: Depression; dizziness; headache; lethargy; paresthesias; vivid dreams.
CVS: Bradycardia; ventricular arrhythmia; syncope.
RESP: Bronchospasm; difficulty breathing; wheezing.
GI: Anorexia; constipation; diarrhea; dyspepsia; flatulence; nausea; vomiting.
MISC: Agranulocytosis; thrombocytopenia; leukopenia or leukocytosis; anemia; other blood dyscrasias.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Place patient on frequent maintenance schedule to avoid periodontal inflammation.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- Beta blockers may mask epinephrine-induced signs and symptoms of hypoglycemia in patients with diabetes.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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spironolactone (SPEER-oh-no-LAK-tone)

Spironolactone, Aldactone

Novo-Spirozine, Novo-Spiroton

Drug Class: Diuretic, potassium-sparing

PHARMACOLOGY

Action

Competitively inhibits aldosterone in distal tubules, resulting in increased excretion of sodium and water and decreased excretion of potassium.

Uses

Short-term preoperative treatment of primary hyperaldosteronism; long-term maintenance therapy for idiopathic hyperaldosteronism; management of edematous conditions in CHF, cirrhosis and nephrotic syndrome; management of essential hypertension; treatment of hypokalemia.

Unlabeled Uses

Treatment of hirsutism; relief of premenstrual syndrome symptoms; short-term treatment of familial male precocious puberty; and short-term treatment of acne vulgaris.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; thirst.
CNS: Drowsiness; lethargy; headache; mental confusion; ataxia.

GI: Cramping; diarrhea; gastric bleeding; gastric ulceration; gastritis; vomiting.
MISC: Gynecomastia; irregular menses or amenorrhea; postmenopausal bleeding; hirsutism; deepening of voice; drug fever; agranulocytosis.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- Place patient on frequent maintenance schedule to avoid periodontal inflammation.
- Blood dyscrasias rarely reported; anticipate increased infection and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for cardiovascular disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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stavudine (STAV-yoo-deen)

Zerit

Drug Class: Antiretroviral, nucleoside reverse transcriptase inhibitor

PHARMACOLOGY

Action

Inhibits replication of HIV.

Uses

For the treatment of HIV-1 infection in combination with other antiretroviral agents.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Peripheral neuropathy; headache; insomnia.
GI: Pancreatitis (may be fatal); diarrhea; nausea and vomiting; abdominal pain; anorexia.
MISC: Allergic reaction; chills/fever; myalgia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values are above this level.
- Consider medical consult to determine disease control and influence on dental treatment.
- Anticipate oral candidiasis when HIV disease is reported.
- Place patient on frequent maintenance schedule to avoid periodontal inflammation.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care because HIV infection reduces host resistance.

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sucralfate (sue-KRAL-fate)

Carafate

PMS-Sucralfate, Nu-Sucralfate, Novo-Sucralfate

Antepsin

Drug Class: GI

PHARMACOLOGY

Action
Adheres to ulcer in acidic gastric juice, forming protective layer that serves as barrier against acid, bile salts, and enzymes present in stomach and duodenum.

Uses
Short-term treatment of duodenal ulcer; maintenance therapy of duodenal ulcer (tablets only).

Unlabeled Uses
Treatment of gastric ulcers; reflux and peptic esophagitis; treatment of NSAID- or aspirin-induced GI symptoms and mucosal damage; prevention of stress ulcers and GI bleeding in critically ill patients; treatment of oral and esophageal ulcers caused by radiation, chemotherapy, and sclerotherapy; treatment of oral ulcerations and dysphagia in patients with epidermolysis bullosa.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Ketoconazole: Decreased ketoconazole effect (decreased absorption)
- Avoid concurrent use.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth.
CNS: Dizziness; insomnia; vertigo; headache.
GI: Constipation (2%); diarrhea; nausea; vomiting; indigestion; flatulence.
MISC: Back pain.

CLINICAL IMPLICATIONS

General
- If patient has GI disease, consider semisupine chair position.
- Use COX inhibitors with caution; they may exacerbate PUD and GERD.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

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sulfasalazine (SULL-fuh-SAL-uh-zeen)

Azulfidine EN-tabs, Azulfidine

Salazopyrin EN-tabs, Salazopyrin Desensitizing Kit, Salazopyrin, ratio-Sulfasalazine

Drug Class: Anti-infective, sulfonamide

PHARMACOLOGY

Action
Competitively antagonizes paraaminobenzoic acid (PABA), an essential component in folic acid synthesis.

Uses
Treatment of ulcerative colitis; rheumatoid arthritis and juvenile rheumatoid arthritis (enteric-coated tablets).

Unlabeled Uses
Treatment of ankylosing spondylitis, collagenous colitis, Crohn disease, psoriasis, psoriatic arthritis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
CNS: Headache; insomnia; peripheral neuropathy; depression; convulsions.
GI: Nausea; vomiting; abdominal pain; diarrhea; anorexia; pancreatitis; impaired folic acid absorption; pseudomembranous enterocolitis.
RESP: Pulmonary infiltrates.
MISC: Drug fever; chills; pyrexia; arthralgia; myalgia; periarteritis nodosum; lupus erythematosus phenomenon.

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Arthritis:* Consider patient comfort and need for semisupine chair position.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education
- Evaluate manual dexterity; consider need for power toothbrush.

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sulfisoxazole (sull-fih-SOX-uh-zole)
Gantrisin Pediatric

Drug Class: Anti-infective, sulfonamide

PHARMACOLOGY
Action
Exerts bacteriostatic action by competing with paraaminobenzoic acid (PABA), an essential component in folic acid synthesis, thus preventing synthesis of folic acid, needed by bacteria for growth.

Uses
ORAL: Treatment of UTI, chancroid, inclusion conjunctivitis, malaria, meningitis caused by *Haemophilus influenzae* or meningococci, nocardiosis, acute otitis media, toxoplasmosis, and trachoma.
OPHTHALMIC: Treatment of conjunctivitis, corneal ulcer, and superficial ocular infections, adjunct to systemic sulfonamide therapy of trachoma.

Unlabeled Uses
ORAL: Treatment of recurrent otitis media.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
CNS: Headache; peripheral neuropathy; depression; convulsions; dizziness; ataxia.
GI: Nausea; vomiting; abdominal pain; diarrhea; anorexia; pancreatitis; impaired folic acid absorption; pseudomembranous enterocolitis.
RESP: Pulmonary infiltrates.

MISC: Drug fever; chills; pyrexia; arthralgia; myalgia; periarteritis nodosum; lupus erythematosus phenomenon. Hypersensitivity reactions may present as erythema multiforme of Stevens-Johnson type, generalized skin eruptions, allergic myocarditis, epidermal necrolysis with or without corneal damage, urticaria, serum sickness; pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, photosensitization, arthralgia, and transient pulmonary changes with eosinophilia and decreased pulmonary function.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.

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sulindac (sull-IN-dak)

Clinoril

 **Nu-Sulindac, Novo-Sundac, APO-Sulin**

 **Copal, Kenalin**

Drug Class: Analgesic; NSAID

PHARMACOLOGY

Action

Decreases inflammation, pain, and fever, probably through inhibition of cyclooxygenase activity and prostaglandin synthesis.

Uses

Treatment of acute and chronic rheumatoid arthritis and osteoarthritis, ankylosing spondylitis, acute gouty arthritis, acute painful shoulder, tendinitis, bursitis.

Unlabeled Uses

Treatment of juvenile rheumatoid arthritis and sunburn.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Stomatitis; dry mucous membranes.

CNS: Dizziness; headaches; nervousness; anxiety; vertigo; lightheadedness; drowsiness; somnolence; tiredness; insomnia; depression; psychic disturbances; seizures; syncope; aseptic meningitis.

GI: Peptic ulceration; GI bleeding; GI pain; dyspepsia; nausea; vomiting; diarrhea; constipation; pancreatitis; flatulence; anorexia; GI cramps; abdominal distress.

RESP: Bronchospasm; laryngeal edema; rhinitis, dyspnea, pharyngitis; hemoptysis; shortness of breath.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Arthritis:* Consider patient comfort and need for semisupine chair position.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

sumatriptan (SUE-muh-TRIP-tan)

Imitrex

Imigran

Drug Class: Analgesic; Migraine

PHARMACOLOGY

Action

Selective agonist for vascular serotonin (5-HT) receptor subtype, causing vasoconstriction of cranial arteries.

Uses

Acute treatment of migraine attacks with/without aura; treatment of acute cluster headaches (injection only).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Mouth or tongue discomfort (5%); jaw discomfort (2%), dry mouth.

CNS: Dizziness/vertigo (12%); paresthesia (5%); drowsiness/sedation, malaise or fatigue (3%); headache (2%); anxiety (1%); phonophobia, photophobia (≥1%); vasculitis; cerebrovascular accident; dysphasia; subarachnoid hemorrhage; panic disorder.

GI: Nausea, vomiting (4% [14% intranasal]); abdominal discomfort, dysphagia (1%); diarrhea, gastric symptoms (≥1%); ischemic colitis with rectal bleeding.

RESP: Bronchospasm (1%); dyspnea (≥1%).

MISC: Tingling (14%); warm/hot sensation (11%); burning sensation (8%); feeling of heaviness or pressure (7%); feeling of tightness, numbness (5%); tightness in chest, cold sensation (3%); pressure in chest, feeling strange, head tightness, pain (2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP and pulse). Drugs for prevention are sympatholytic; drugs for treatment of acute attack are sympathomimetic.
- *Photophobia:* Direct dental light out of patient's eyes and offer dark glasses for comfort.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

tacrine HCl (TAK-reen HIGH-droe-KLOR-ide)

Synonyms: tetrahydroaminoacridine; THA

Cognex

Drug Class: Reversible cholinesterase inhibitor

PHARMACOLOGY

Action

Believed to inhibit (reversibly) cholinesterase in CNS, leading to increased concentrations of acetylcholine.

Uses

Treatment of mild to moderate dementia of Alzheimer type.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Glossitis, dry mouth, stomatitis (1%); salivation.

CNS: Dizziness (12%); headache (11%); agitation, confusion (7%); ataxia, insomnia (6%); depression, fatigue, somnolence (4%); abnormal thinking, anxiety (3%); tremor, hallucinations, hostility (2%); convulsions, vertigo, syncope, hyperkinesias, paresthesia, nervousness (≥1%).

CVS: Hypotension, hypertension (>1%); atrial fibrillation; palpitation.

GI: Nausea/vomiting (28%); diarrhea (16%); dyspepsia, anorexia (9%); abdominal pain (8%); flatulence, constipation (4%).

RESP: Coughing, URI (3%); bronchitis, pneumonia, dyspnea (≥1%).

MISC: Elevated transaminases (29%); chest pain (4%); back pain, asthenia, purpura (2%); chills, fever, malaise, peripheral edema (≥1%).

CLINICAL IMPLICATIONS

General

- Patient may experience hypotension or hypertension. Monitor vital signs at each appointment; anticipate syncope.
- Ensure that caregiver is present at every dental appointment and understands informed consent.
- Place on frequent maintenance schedule to avoid periodontal inflammation.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- Teach caregiver to assist patient with oral self-care practices.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Evaluate manual dexterity; consider need for power toothbrush.

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tacrolimus (tack-CROW-lih-muss)

(FK506)

Prograf, Protopic

Drug Class: Immunosuppressive

PHARMACOLOGY

Action

Suppresses cell-mediated immune reactions and some humoral immunity, but exact mechanism is not known.

Uses

PO AND IV: Prophylaxis of organ rejection in patients receiving allogenic liver or kidney transplants. Used in conjunction with adrenal corticosteroids.

TOPICAL: Atopic dermatitis.

Unlabeled Uses

Prophylaxis of rejection for patients receiving kidney, bone marrow, cardiac, pancreas, pancreatic island cell, and small bowel transplantation.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole, ketoconazole, or itraconazole: Possible tacrolimus toxicity (decreased metabolism)

- Avoid concurrent use.

Clarithromycin: Tacrolimus toxicity (decreased metabolism)
- Avoid concurrent use.

Metronidazole: Possible tacrolimus toxicity (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS

CNS: Headache; insomnia; anxiety; paresthesia; tremor, weakness, abnormal dreams, agitation, confusion (oral and IV); depression, dizziness, migraine, neuritis (topical).

CVS: Chest pain, hypertension (47% to 56%); hyperkalemia (45%); postural hypotension (3% to 15%).

GI: Diarrhea; nausea; constipation; anorexia; vomiting; abdominal pain; dyspepsia, gastroenteritis, gastritis (topical).

RESP: Dyspnea; pleural effusion, atelectasis (oral and IV); increased cough, asthma, bronchitis, pneumonia, hypoxia, lung disorder (topical).

MISC: Fever; pain; back pain; ascites (oral and IV); flu-like symptoms, allergic reaction, infection, accidental injury, lack of drug effect, lymphadenopathy, face edema, hyperesthesia, varicella zoster/herpes zoster, asthenia, periodontal abscess, myalgia, cyst, arthralgia, arthritis, anaphylactoid reaction, angioedema, breast pain, cheilitis, chills, dehydration, epistaxis, exacerbation of untreated area, hernia, malaise, neck pain, photosensitivity (topical); anemia (5% to 47%); thrombocytopenia (14% to 24%); leukocytosis.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- Blood dyscrasias reported; anticipate increased bleeding, infection, and poor healing.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Determine need for power toothbrush for self-care.
- Encourage daily plaque control procedures for effective self-care.

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tadalafil (tah-DAH-lah-fil)

Cialis

Drug Class: Agent for impotence

PHARMACOLOGY

Action

Enhances the effect of nitric oxide at the nerve ending and endothelial cells in the corpus cavernosum by inhibiting phosphodiesterase type 5 in the corpus cavernosum of the penis. This results in vasodilation, increased inflow of blood into the corporus cavernosum, and ensuing penile erection upon sexual stimulation.

Uses

Treatment of erectile dysfunction.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, dysphagia, esophagitis (<2%).

CNS: Headache (15%); fatigue, dizziness, hypesthesia, insomnia, paresthesia, somnolence, vertigo (<2%).

CVS: Hypotension; vasodilation.

GI: Dyspepsia (10%); diarrhea (<2%).

RESP: Epistaxis, pharyngitis (<2%).

MISC: Back pain (6%); limb pain, flushing (3%); asthenia, face edema, pain (<2%).

CLINICAL IMPLICATIONS

General

- Concurrent administration with nitroglycerin may lead to severe hypotension. Avoid concurrent use.
- Tadalafil is long-acting; monitor vital signs for cardiovascular effects.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *For back pain:* Consider semisupine chair position for patient comfort.

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tamoxifen citrate (ta-MOX-ih-fen SI-trait)

Apo-Tamox, Gen-Tamoxifen, Nolvadex-D, Novo-Tamoxifen, PMS-Tamoxifen, Tamofen

Bilem, Cryoxifeno, Tamoxan, Taxus, Tecnofen

Drug Class: Antiestrogen hormone

PHARMACOLOGY

Action

A nonsteroidal agent with antiestrogenic properties.

Uses

Breast carcinoma in women; metastatic breast carcinoma in men and women; reduction in risk of breast cancer in high-risk women; lower risk of invasive breast cancer in women with ductal carcinoma in situ.

Unlabeled Uses

Mastalgia; decreasing the size and pain of gynecomastia; McCune-Albright syndrome in female pediatric patients (in combination with other agents).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Taste disturbance; food distaste.

CNS: Headache; dizziness; depression.

GI: Moderate to low potential for nausea and vomiting.

MISC: At doses of 40 mg/day, tamoxifen has increased the risk of endometrial cancer; hot flashes.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.

tamsulosin HCl (tam-SOO-loe-sin HIGH-droe-KLOR-ide)

Flomax

Drug Class: Antiadrenergic, peripherally acting

PHARMACOLOGY

Action

Selectively blocks alpha$_1$-adrenergic receptors causing relaxation of prostate smooth muscle resulting in an increase in urinary flow rate and a reduction in symptoms of BPH.

Uses

Treatment of signs and symptoms of benign prostatic hyperplasia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Tooth disorder (2%).

CNS: Headache (21%); dizziness (17%); somnolence (4%); decreased libido (2%); insomnia (1%).

CVS: Chest pain (4%).

GI: Diarrhea (6%); nausea (4%).

RESP: Increased cough (5%); sinusitis (4%).

MISC: Infection (11%); asthenia (9%); back pain (8%).

CLINICAL IMPLICATIONS

General

- If respiratory or musculoskeletal side effects occur, consider semisupine chair position.

telbivudine (tel-BI-vyoo-deen)

Tyzeka

Drug Class: Antiviral

PHARMACOLOGY

Action

Telbivudine is phosphorylated by cellular kinases to the active triphosphate form. The telbivudine 5-triphosphate is incorporated into viral DNA, causing DNA chain termination that results in inhibition of hepatitis B virus (HBV) replication.

Uses

Treatment of chronic hepatitis B in adults with evidence of viral replication and either evidence of persistent elevations in serum aminotransaminases or histologically active disease.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Fatigue, malaise (12%); headache (11%); dizziness, pyrexia (4%); insomnia (3%).

GI: Diarrhea/loose stools, nausea, vomiting (7%); dyspepsia (3%).

RESP: Upper respiratory tract infection (14%); cough (7%).

MISC: Abdominal pain (12%); influenza and influenza-like symptoms, postprocedural pain (7%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment. Take precautions to avoid cross-contamination.
- Consider medical consult to determine disease control and influence on dental treatment.
- If GI side effects occur, consider semisupine chair position.
- If respiratory side effects are problematic, consider semisupine chair position to assist respiratory function.
- Follow standard precautions to avoid cross-contamination.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care because HBV infection may reduce host resistance.

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telithromycin (tel-ITH-roe-MY-sin)

Ketek

Drug Class: Antibiotic

PHARMACOLOGY

Action

Interferes with microbial protein synthesis.

Uses

Treatment of acute bacterial exacerbation of chronic bronchitis, acute bacterial sinusitis, and community-acquired pneumonia caused by strains of susceptible organisms.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; oral candidiasis; glossitis; stomatitis.

CNS: Headache (6%); dizziness (4%); somnolence, insomnia, vertigo, increased sweating, fatigue (<2%).

GI: Diarrhea (11%); nausea (8%); vomiting (3%); loose stools, dysgeusia (2%); abdominal distension, dyspepsia, GI upset, flatulence, constipation, gastroenteritis, gastritis, anorexia, watery stools, abdominal pain, upper abdominal pain (<2%).

MISC: Allergy, including face edema, angioedema, anaphylaxis.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

telmisartan (tell-mih-SAHR-tan)

Micardis

Drug Class: Antihypertensive; Angiotensin II antagonist

PHARMACOLOGY

Action

Antagonizes the effect of angiotensin II (vasoconstriction and aldosterone secretion) by blocking the angiotensin II (AT_1 receptor) in vascular smooth muscle and the adrenal gland, producing decreased BP.

Uses

Treatment of hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

GI: Diarrhea (3%).

RESP: URI (7%).

CVS: Palpitation.

MISC: Back pain (3%), liver toxicity.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

temazepam (tem-AZE-uh-pam)

Restoril

Apo-Temazepam, Gen-Temazepam, Novo-Temazepam, Nu-Temazepam, PMS-Temazepam

Drug Class: Sedative; Hypnotic; Benzodiazepine

DEA Schedule: Schedule IV (Canada: Schedule F)

PHARMACOLOGY

Action

Potentiates action of GABA (gamma-aminobutyric acid), an inhibitory neurotransmitter, resulting in increased neuronal inhibition and CNS depression, especially in limbic system and reticular formation.

Uses
Short-term management of insomnia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Taste alteration; dry mouth.

CNS: Drowsiness; dizziness; lethargy; confusion; euphoria; weakness; falling; ataxia; hallucinations; paradoxical reactions (e.g., excitement, agitation); headache; memory impairment.

CVS: Palpitation; tachycardia.

GI: Anorexia; diarrhea; abdominal cramping; constipation; nausea; vomiting.

MISC: Tolerance; physical and psychological dependence; slurred speech; elevated AST, ALT, bilirubin; leukopenia; granulocytopenia.

CLINICAL IMPLICATIONS
General
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.
- Blood dyscrasias rarely reported; anticipate increased infection and poor healing.

Oral Health Education
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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tenofovir disoproxil fumarate (teh-NOE-fo-veer DIE-so-prox-ill FYU-mah-rate)

Viread

Drug Class: Antiretroviral, nucleotide analog reverse transcriptase inhibitor

PHARMACOLOGY
Action
Tenofovir disoproxil fumarate is a prodrug of tenofovir, which inhibits the activity of HIV reverse transcriptase by competing with deoxyadenosine 5′-triphosphate and by DNA chain termination after incorporation into DNA.

Uses
Treatment of HIV-1 infection in combination with other antiretroviral agents.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
CNS: Asthenia (11%); headache, depression (8%); peripheral neuropathy (5%); insomnia (4%); dizziness (3%).

GI: Diarrhea (16%); nausea (11%); abdominal pain, vomiting (7%); anorexia, dyspepsia, flatulence (4%); pancreatitis.

RESP: Pneumonia (3%), dyspnea (postmarketing).

MISC: Pain (12%); fever (4%); chest pain (3%).

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.

- Consider medical consult to determine disease control and influence on dental treatment.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values are above this level.
- Anticipate oral candidiasis when HIV disease is reported.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care because HIV infection reduces host resistance.

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terazosin (ter-AZE-oh-sin)

Hytrin

Apo-Terazosin, Novo-Terazosin, Nu-Terazosin, PMS-Terazosin, ratio-Terazosin

Adecur

Drug Class: Antihypertensive; Antiadrenergic, peripherally acting

PHARMACOLOGY

Action

Selectively blocks postsynaptic alpha$_1$-adrenergic receptors, resulting in dilation of arteries and veins.

Uses

Management of hypertension and symptomatic BPH.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Dizziness; nervousness; paresthesia; somnolence; anxiety; headache; insomnia; weakness; drowsiness.

CVS: Postural hypotension (4%).

GI: Nausea; vomiting; diarrhea; constipation; abdominal discomfort or pain; flatulence.

RESP: Dyspnea; bronchitis; bronchospasm; flu-like symptoms; increased cough.

MISC: Shoulder, neck, back, or extremity pain; arthralgia; edema; fever; weight gain; thrombocytopenia.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is $\geq 180/110$ or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Blood dyscrasias rarely reported; anticipate increased bleeding.
- If musculoskeletal pain occurs, consider semisupine chair position for patient comfort.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

terbinafine (TER-bin-a-feen)

Lamisil, Lamisil AT

Apo-Terbinafine, Gen-Terbinafine, Novo-Terbinafine, PMS-Terbinafine

Drug Class: Anti-infective; Antifungal

PHARMACOLOGY

Action

Inhibits squalene epoxidase, resulting in ergosterol deficiency and a corresponding accumulation of squalene within the fungal cell leading to fungal cell death.

Uses

Treatment of onychomycosis caused by dermatophytes.
TOPICAL: Interdigital tinea pedis, tinea cruris, or tinea corporis caused by *Epidermophyton floccosum*, *Trichophyton mentagrophytes*, or *T. rubrum*.

Unlabeled Uses

Cutaneous candidiasis, pityriasis (tinea) versicolor (topical).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Taste disturbance.

GI: Abdominal pain; diarrhea; dyspepsia; flatulence; nausea.

MISC: Headache; liver enzyme abnormalities; visual disturbance.

CLINICAL IMPLICATIONS

General

- If GI side effects occur, consider semisupine chair position.

terbutaline sulfate (ter-BYOO-tuh-leen SULL-fate)

Brethaire, Brethine

Bricanyl Turbuhaler

Taziken

Drug Class: Bronchodilator; Sympathomimetic

PHARMACOLOGY

Action

Produces bronchodilation by relaxing bronchial smooth muscle through beta$_2$-receptor stimulation.

Uses

Treatment of reversible bronchospasm associated with asthma, bronchitis, and emphysema.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Taste disturbance.

CNS: Stimulation; tremor; dizziness; nervousness; drowsiness; headache; weakness.

CVS: Palpitations (23%); tachycardia, chest tightness, arrhythmia; ECG changes (e.g., sinus pause, atrial premature beats, AV block, ventricular premature beats, ST–T-wave depression, T-wave inversion, sinus bradycardia, atrial escape beat with aberrant conduction); increased heart rate.

GI: Nausea; vomiting; GI distress.

RESP: Dyspnea.

MISC: Flushing; sweating; muscle cramps; hypersensitivity vasculitis; muscle cramps; central stimulations; pain at injection site; elevations in liver enzymes; seizures; hypersensitivity vasculitis.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Monitor vital signs (e.g., BP, pulse rate, respiratory rate and function); uncontrolled disease characterized by wheezing and coughing.
- Acute bronchoconstriction can occur during dental treatment, have bronchodilator inhaler available.
- Ensure that bronchodilator inhaler is present at each dental appointment.

Oral Health Education

- Request patient bring bronchodilator inhaler to each dental appointment.

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teriparatide (TEH-rih-PAR-ah-TIDE)

Forteo

Drug Class: Parathyroid hormone

PHARMACOLOGY

Action

Regulates bone metabolism, renal tubular reabsorption of calcium and phosphate, and intestinal calcium reabsorption.

Uses

Treatment of postmenopausal women with osteoporosis who are at high risk for fracture (i.e., history of osteoporotic fracture); increase bone mass in men with primary or hypogonadal osteoporosis who are at high risk of fracture (i.e., history of osteoporotic fracture).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Tooth disorder (unspecified).

CNS: Dizziness; headache; insomnia; depression; vertigo.

CVS: Postural hypotension.

GI: Nausea; constipation; dyspepsia; diarrhea; vomiting; GI disorder.

RESP: Rhinitis; increased cough; pharyngitis; pneumonia; dyspnea.

MISC: Arthralgia; leg cramp; pain; asthenia; neck pain.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Patient may be high-risk candidate for pathological fractures or jaw fractures during extractions.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

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tetracaine HCl (TEH-trah-cane HIGH-droe-KLOR-ide)

Cepacol Viractin: Cream: 2%; Gel: 2%

Ametop

Drug Class: Local anesthetic, topical, ester type

PHARMACOLOGY

Action

Blocks sodium ion influx into neurons preventing depolarization of nerve fibers.

Uses

Skin disorders: For topical anesthesia in local skin disorders, including pruritus and pain due to minor burns, skin manifestations of systemic disease (e.g., chickenpox), prickly heat, abrasions, sunburn, plant poisoning, insect bites, eczema; local analgesia on normal, intact skin.

Mucous membranes: For local anesthesia of accessible mucous membranes, including oral, nasal, and laryngeal mucous membranes; respiratory or urinary tracts. Also for the treatment of pruritus ani, pruritus vulvae, and hemorrhoids.

Contraindications

Hypersensitivity to any component of these products; ophthalmic use.

Usual Dosage

Painful oral mucosal lesions

2% CREAM OR GEL

ADULTS AND CHILDREN: Apply topically 3 to 4 times daily.

DRUG INTERACTIONS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Stinging; burning; numbness.

CLINICAL IMPLICATIONS

General

- Topical anesthetics may impair swallowing and enhance danger of aspiration. Do not ingest food for 1 hr after anesthetic use in mouth or throat. This is particularly important in children because of their frequency of eating.
- Limit area of application; avoid using spray form of product due to risk of toxicity.

Pregnancy Risk Category: Category C.

Oral Health Education

- Do not ingest food for 1 hr following use of oral topical anesthetic preparations in the mouth or throat. Topical anesthesia may impair swallowing, thus enhancing the danger of aspiration.
- Numbness of the tongue or buccal mucosa may increase the danger of biting trauma. Do not eat or chew gum while the mouth or throat area is anesthetized.

tetracycline HCl (teh-truh-SIGH-kleen HIGH-droe-KLOR-ide)

Sumycin 250: Tablets: 250 mg
Sumycin 500: Tablets: 500 mg
Sumycin Syrup: Oral Suspension: 125 mg per 5 mL

Apo-Tetra, Novo-Tetra, Nu-Tetra

Acromicina, Ambotetra, Quimocyclar, Terranumonyl, Tetra-Atlantis, Zorbenal-G

Drug Class: Antibiotic, tetracycline

PHARMACOLOGY

Action

Inhibits bacterial protein synthesis.

Uses

Treatment of infections caused by susceptible strains of gram-positive and gram-negative bacteria; treatment of *Rickettsia*, *Mycoplasma pneumoniae*; chlamydial infections including treatment of trachoma; adjunctive treatment in severe acne; treatment of susceptible infections when penicillins are contraindicated; adjunctive treatment of acute intestinal amebiasis; treatment of nongonococcal urethritis caused by *Ureaplasma urealyticum*; treatment of relapsing fever due to *Borrelia recurrentis*.

Contraindications

Hypersensitivity to tetracyclines or any component.

Usual Dosage

ADULTS: *PO:* Usual dose: 1 to 2 g/day in two or four equal doses.
MILD TO MODERATE INFECTIONS: 500 mg bid or 250 mg qid.
SEVERE INFECTIONS: 500 mg qid.
CHILDREN OLDER THAN 8 YR: *PO:* 25 to 50 mg/kg/day in four equally divided doses.

Pharmacokinetics

ABSORP: Tetracycline is adequately, but incompletely, absorbed from the GI tract.
DIST: Tetracycline is about 65% bound to plasma proteins (short-acting). The protein binding for intermediate and long-acting analogs is usually greater. Penetration into most body fluids and tissues is excellent. Tetracycline is distributed in varying degrees in liver, bile, lung, kidney, prostate, urine, CSF, synovial fluid, mucosa of the maxillary sinus, brain, sputum, and bone. Tetracycline crosses the placenta and enters fetal circulation and amniotic fluid.
METAB: Tetracycline is concentrated by the liver in the bile.
EXCRET: Tetracycline is excreted in both urine and feces at high concentrations in a biologically active form.
SPECIAL POP: *Renal failure:* Because renal clearance is by glomerular filtration, excretion is significantly affected by the state of renal function.

DRUG INTERACTIONS

Antacids: Decreased oral tetracycline effect (decreased absorption)
- Avoid concurrent use.

Antiseptics, mercurial (contact lens cleansing solutions): Conjunctivitis (mechanism unknown)
- Avoid concurrent use.

Atovaquone: Decreased atovaquone effect (decreased metabolism)
- Avoid concurrent use.

Bismuth subsalicylate: Decreased tetracycline effect (decreased absorption)
- Avoid concurrent use.

Digoxin: Possible digoxin toxicity (decreased metabolism)
- Avoid concurrent use.

Iron: Decreased tetracycline effect (decreased absorption)
- Administer 3 hr apart.

Kaolin or kaolin-pectin: Decreased tetracycline effect (decreased absorption)
- Avoid concurrent use.

Lithium: Lithium toxicity (decreased renal excretion)
- Monitor clinical status.

Molindone: Decreased tetracycline effect (decreased absorption)
- Administer 2 hr apart.

Risperidone: Possible decreased risperidone effect (mechanism unknown)
- Monitor clinical status.

Zinc: Decreased tetracycline effect (decreased absorption)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Black hairy tongue; dysphagia; glossitis; stomatitis; sore throat.
CVS: Pericarditis (as component of hypersensitivity reaction).
CNS: Dizziness; headache.
GI: Diarrhea; nausea; vomiting; abdominal pain or discomfort; bulky, loose stools; anorexia; hoarseness; enterocolitis; inflammatory lesions; epigastric distress.
MISC: Hypersensitivity, including anaphylaxis.

CLINICAL IMPLICATIONS

General

When prescribed by DDS:
- *Lactation:* Excreted in breast milk.
- *Children:* Avoid in children younger than 8 yr of age because abnormal bone formation and discoloration of teeth may occur.
- *Renal failure:* Excessive accumulation may occur in patients with renal impairment, resulting in possible liver toxicity; dosage reduction may be required.
- *Superinfection:* Prolonged use may result in bacterial or fungal overgrowth.
- *Pseudomembranous colitis:* Consider in patients in whom diarrhea develops.
- *Pseudotumor cerebri (benign intracranial hypertension):* Reported in adults. Usual manifestations are headache and blurred vision.
- *Sensitivity reactions:* Because sensitivity reactions are more likely to occur in persons with a history of allergy, hay fever, or urticaria, the preparation should be used with caution in such individuals. Cross-sensitization among the various tetracyclines is extremely common.
- *Overdosage:* Nausea, vomiting, headache, increased intracranial pressure, skin pigmentation.

When prescribed by medical facility:
- Determine why drug is being taken. If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.

Pregnancy Risk Category: Category D. Avoid during pregnancy.

Oral Health Education

When prescribed by DDS:
- Ensure patient knows how to take the drug, how long it should be taken and to immediately report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset). See Chapter 4: *Medical Management of Odontogenic Infections*.
- Explain name, dose, action, and potential side effects of drug.
- Review dosing schedule and prescribed length of therapy with patient. Advise patient that dose, dosing frequency, and duration of therapy are dependent on site and cause of infection.
- Inform patient that antibacterial drug regimens must be followed to completion.

- Instruct patient using capsules or tablets to take prescribed dose with a full glass of water to reduce risk of esophageal irritation or ulceration.
- Instruct patient or caregiver using oral suspension to measure and administer prescribed dose using dosing spoon, dosing syringe, or medicine cup.
- Advise patient to take prescribed dose at least 2 hr before or after meals.
- Advise patient to take 2 hr before or after antacids containing aluminum, calcium, or magnesium or preparations containing iron or zinc, milk, or other dairy products.
- Instruct patient to complete entire course of therapy, even if symptoms of infection disappear.
- Advise patient to discontinue therapy and contact health care provider immediately if skin rash, hives, itching, shortness of breath, or headache and blurred vision occur.
- Advise patient that medication may cause photosensitivity (sensitivity to sunlight) and to avoid unnecessary exposure to sunlight or tanning lamps, to use sunscreens, and to wear protective clothing to avoid photosensitivity reactions.
- Caution women taking oral contraceptives that tetracycline may make birth control pills less effective and to use nonhormonal forms of contraception during treatment.
- Advise women to notify health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Caution patient that drug may cause dizziness, lightheadedness, or feeling of a whirling motion and to use caution while driving or performing other hazardous tasks until tolerance is determined.
- Advise patient to report following signs of superinfection to health care provider: black furry tongue, white patches in mouth, foul-smelling stools, or vaginal itching or discharge.
- Warn patient that diarrhea containing blood or pus may be a sign of a serious disorder and to seek medical care if noted and not treat at home.
- Caution patient to not take any prescription or OTC medications, dietary supplements, or herbal preparations unless advised by health care provider.
- Advise patient to discard any unused tetracycline by the expiration date noted on the label.
- Advise patient that follow-up examinations and laboratory tests may be required to monitor therapy and to keep appointments.

theophylline (thee-AHF-ih-lin)

Accurbron, Asmalix, Bronkodyl, Elixophyllin, Lanophyllin, Slo-bid Gyrocaps, Slo-Phyllin, Theo-24, Theochron, T-Phyl, Uni-Dur, Uniphyl

Apo-Theo LA, Novo-Theophyl SR

Teolong

Drug Class: Bronchodilator; Xanthine derivative

PHARMACOLOGY

Action

Relaxes bronchial smooth muscle and stimulates central respiratory drive.

Uses

Prevention or treatment of reversible bronchospasm associated with asthma or COPD.

Unlabeled Uses

Treatment of apnea and bradycardia of prematurity; reduction of essential tremor.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Diazepam, alprazolam, or midazolam: Decreased diazepam, alprazolam, or midazolam effect (pharmacological antagonism)
- Avoid concurrent use.

Clarithromycin or azithromycin: Possible theophylline toxicity (decreased metabolism)
- Avoid concurrent use.

Sympathomimetic amines: Arrhythmias (mechanism unknown)
- Monitor clinical status.

ADVERSE EFFECTS

CNS: Irritability; headache; insomnia; muscle twitching; seizures.
CVS: Hypotension; cardiac arrhythmia; tachycardia (high doses).
GI: Nausea; vomiting; gastroesophageal reflux; epigastric pain.
RESP: Tachypnea; respiratory arrest.
MISC: Fever; flushing; hyperglycemia; inappropriate antidiuretic hormone secretion; sensitivity reactions (e.g., exfoliative dermatitis, urticaria).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse rate, respiratory rate and function); uncontrolled disease characterized by wheezing and coughing.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Ensure that bronchodilator inhaler is present at each dental appointment.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.

Oral Health Education

- Request patient bring bronchodilator inhaler to each dental appointment.

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thioridazine HCl (THIGH-oh-RID-uh-zeen HIGH-droe-KLOR-ide)

Thioridazine HCl

Apo-Thioridazine

Melleril

Drug Class: Antipsychotic, phenothiazine

PHARMACOLOGY

Action

Effects apparently caused by dopamine receptor blocking in CNS.

Uses

Management of schizophrenia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; tardive dyskinesia.
CNS: Pseudoparkinsonism; dystonias; motor restlessness; headache; weakness; tremor; fatigue; slurring; insomnia; vertigo; seizures; drowsiness; paradoxical excitement; headache; confusion.
CVS: Hypotension.
GI: Dyspepsia; constipation; adynamic ileus; nausea; vomiting; diarrhea.
RESP: Laryngospasm; respiratory depression; bronchospasm; dyspnea.
MISC: Increase in appetite and weight; polydipsia; neuroleptic malignant syndrome; allergy (e.g., fever, laryngeal edema, angioneurotic edema, asthma); elevated prolactin levels; agranulocytosis; leukopenia; anemia; thrombocytopenia.

CLINICAL IMPLICATIONS

General

- Clients with psychological disease may present with behavior management problems.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.

- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Place patient on frequent maintenance schedule to avoid periodontal inflammation.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.
- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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thiothixene (THIGH-oh-THIX-een)

Navane

Drug Class: Antipsychotic, thioxanthene

PHARMACOLOGY

Action

Produces antipsychotic effects apparently because of dopamine receptor blocking in CNS.

Uses

Management of schizophrenia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; tardive dyskinesia.

CNS: Extrapyramidal symptoms (e.g., pseudoparkinsonism, akathisia, dystonias); drowsiness; insomnia; restlessness; agitation; seizures; paradoxical exacerbation of psychotic symptoms.

CVS: Hypotension, tachycardia.

GI: Anorexia; diarrhea; nausea; vomiting; constipation.

RESP: Laryngospasm; bronchospasm; increased depth of respiration.

MISC: Hypoglycemia; hyperglycemia; glycosuria; polydipsia; increase in appetite and weight; peripheral edema; elevated prolactin levels; increased sweating; photosensitivity.

CLINICAL IMPLICATIONS

General

- Patients with psychological disease may present with behavior management problems.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Place on frequent maintenance schedule to avoid periodontal inflammation.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Monitor vital signs.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.
- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

thyroid, desiccated (THIGH-royd, DESS-ih-KATE-uhd)

Synonym: thyroid USP

Armour Thyroid, S-P-T, Thyrar, Thyroid Strong

Drug Class: Thyroid

PHARMACOLOGY

Action

Increases metabolic rate of body tissues.

Uses

Replacement or supplemental therapy in hypothyroidism; thyroid-stimulating hormone suppression in thyroid cancer, nodules, goiters, and enlargement in chronic thyroiditis; diagnostic agent to differentiate suspected hyperthyroidism from euthyroidism.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Tremors; headache; nervousness; insomnia.

GI: Diarrhea; vomiting.

MISC: Hypersensitivity; weight loss; sweating; heat intolerance; fever. Adverse reactions generally indicate hyperthyroidism caused by therapeutic overdosage.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Hypothyroidism:* Oral health care has no contraindications when the disease is controlled with medication.
- Monitor blood pressure and pulse rate to determine degree of thyroid disease control.
- Avoid prescribing CNS depressant drugs to the patient with uncontrolled hypothyroid disease.

Oral Health Education

- Determine need for power toothbrush for self-care.

tiagabine HCl (TIE-egg-un-bine HIGH-droe-KLOR-ide)

Gabitril Filmtabs

Drug Class: Anticonvulsant

PHARMACOLOGY

Action

Mechanism unknown; may block gamma-aminobutyric acid (GABA) uptake into presynaptic neurons, allowing more GABA to be available for binding with the GABA receptor of postsynaptic cells.

Uses

Adjunctive treatment in treatment of partial seizures.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Mouth ulceration; gingivitis.

CNS: Dizziness; lightheadedness; somnolence; nervousness; irritability; agitation; hostility; language problem; tremor; abnormal gait; ataxia; abnormal thinking; concentration/attention difficulty; depression; confusion; insomnia; speech disorder; difficulty with memory; paresthesia; emotional lability.

CVS: Vasodilation.

GI: Nausea; abdominal pain; diarrhea; vomiting; increased appetite.

MISC: Asthenia; lack of energy; pain; cough; myasthenia; accidental injury; infection; flu-like syndrome; myalgia; urinary tract infection.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine level of disease control, type and frequency of seizure, and compliance with medication regimen.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.

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ticlopidine HCl (tie-KLOE-pih-DEEN HIGH-droe-KLOR-ide)

Ticlid

Apo-Ticlopidine, Gen-Ticlopidine, Nu-Ticlopidine, PMS-Ticlopidine, Rhoxal-ticlopidine

Drug Class: Antiplatelet

PHARMACOLOGY

Action

Produces time- and dose-dependent inhibition of both platelet aggregation and release of platelet granule constituents as well as prolongation of bleeding time; interferes with platelet membrane function by inhibiting platelet-fibrinogen binding and subsequent platelet-platelet interactions.

Uses

Reduction of risk of thrombotic stroke in patients who have experienced stroke precursors and in patients who have suffered thrombotic stroke. Reserved for patients intolerant to aspirin because of greater risk of adverse reactions.

Unlabeled Uses

Improved walking distance in intermittent claudication; vascular improvement in chronic arterial occlusion; reduced incidence of neurological deficit in subarachnoid hemorrhage; reduced incidence of vascular occlusion in uremic patients with arteriovenous shunts or fistulas; control of platelet count in open heart surgery; decreased graft occlusion in coronary artery bypass grafts; reduced degree of proteinuria and hematuria in primary glomerulonephritis; reduced incidence, duration, and severity of infarctive crises in sickle cell disease.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Increased bleeding.

CNS: Headache; peripheral neuropathy; dizziness.

GI: Diarrhea; nausea; fullness; dyspepsia; GI pain; purpura; vomiting; flatulence; anorexia.

MISC: Weakness; pain; allergic pneumonitis; systemic lupus erythematosus; arthropathy; myositis; hyponatremia; aplastic anemia; hepatic necrosis; peptic ulcer; renal failure; sepsis; angioedema; hepatocellular jaundice; neutropenia; agranulocytosis; thrombocytopenia; leukopenia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine bleeding time before completing procedures that may result in significant bleeding. Safe levels are <20 min.
- Monitor frequently to ensure adequate clotting during treatment that involves bleeding.
- If uncontrolled bleeding develops, use hemostatic agents and positive pressure to induce hemostasis. Do not dismiss patient until bleeding is controlled.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.

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tigecycline (tye-ge-SYE-kleen)

Tygacil

Drug Class: Anti-infective; Glycylcycline

PHARMACOLOGY

Action

Tigecycline, a glycylcycline, inhibits protein transportation in bacteria by binding to the 30S ribosomal subunit and blocking entry of amino-acyl tRNA molecules into the A site of the ribosome. This prevents incorporation of amino acid residues into elongating peptide chains. Glycylcycline class antibiotics are structurally similar to tetracycline class antibiotics and may have similar adverse reactions.

Uses

Treatment of complicated skin and skin structure infections and complicated intra-abdominal infections caused by susceptible strains of specific microorganisms.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (less than 2%).
CVS: Hypertension (5%); phlebitis (2%); bradycardia, tachycardia, thrombophlebitis, vasodilatation (less than 2%).
CNS: Headache (6%); dizziness (4%); asthenia (3%); insomnia (2%); somnolence (less than 2%); hypotension.
GI: Nausea (30%); vomiting (20%); diarrhea (13%); constipation, dyspepsia (3%); abnormal stools, anorexia; abdominal pain.
RESP: Increased cough (4%); dyspnea (3%); pulmonary physical finding (2%).
MISC: Infection (8%); fever (7%); pain (4%); abscess, peripheral edema (3%); death (2%); allergic reactions, chills, septic shock (less than 2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.

timolol maleate (TI-moe-lahl MAL-ee-ate)

Betimol, Blocadren, Istalol, Timoptic, Timoptic Ocudose, Timoptic-XE

Apo-Timol, Apo-Timop, Gen-Timolol, Novo-Timol Tablets, Nu-Timolol, PMS-Timolol, ratio-Timolol, Rhoxal-timolol

Drug Class: Beta-adrenergic blocker

PHARMACOLOGY

Action

Blocks beta-receptors, which primarily affect heart (slows rate), vascular musculature (decreases BP), and lungs (reduces function). Reduces elevated and normal intraocular pressure (IOP) via decreasing production of aqueous humor or increasing flow.

Uses

Treatment of hypertension, alone or in combination with other agents; reduction of risk of reinfarction post-MI; migraine prophylaxis; treatment of elevated IOP in chronic open-angle glaucoma, ocular hypertension, aphakic glaucoma patients, patients with secondary glaucoma, and in patients with elevated IOP who need ocular pressure lowered.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

Sympathomimetic amines: Decreased antihypertensive effect with epinephrine (pharmacological antagonism)
- Monitor blood pressure. Use local anesthetic agents with vasoconstrictor with caution. Hypertensive reactions with epinephrine (unopposed alpha-adrenergic stimulation)
- Monitor blood pressure. Use local anesthetic agents with vasoconstrictor with caution. Decreased antianaphylactic effect of epinephrine (beta blockade)
- Increase epinephrine dosage may be required in anaphylaxis.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disturbance; stomatitis.

CNS: Dizziness; depression; lethargy; headache; insomnia; anxiety; tremor; paresthesia.

CVS: Bradycardia; arrhythmia.

GI: Abdominal pain; diarrhea; nausea.

RESP: Wheezing; cough; breathing difficulties, especially in asthmatic patients or patients with COPD.

MISC: Joint pain; muscle cramps.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Place patient on frequent maintenance schedule to avoid periodontal inflammation.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- Beta blockers may mask epinephrine-induced signs and symptoms of hypoglycemia in patients with diabetes.

- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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tiotropium bromide (tye-oh-TROE-pee-uhm BROE-mide)

Spiriva

Drug Class: Anticholinergic

PHARMACOLOGY

Action

Inhibits smooth muscle receptors, leading to bronchodilation.

Uses

Long-term, maintenance treatment of bronchospasm associated with COPD, including chronic bronchitis and emphysema.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (16%); stomatitis (including ulcerative stomatitis).

CVS: Angina pectoris (including aggravated angina pectoris, [1% to 3%]).

CNS: Dysphonia, paresthesia, depression (1% to 3%).

GI: Dyspepsia (6%); abdominal pain (5%); constipation, vomiting (4%); gastroesophageal reflux (1% to 3%).

RESP: Upper respiratory tract infection (41%); sinusitis (11%); rhinitis (6%); epistaxis (4%); coughing (at least 3%); laryngitis (1% to 3%).

MISC: Accidents (13%); nonspecific chest pain (7%); dependent edema (5%); infection, moniliasis (4%); arthritis, flu-like symptoms (at least 3%); allergic reaction, leg pain, herpes zoster infection (1% to 3%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse rate) and respiratory function. Uncontrolled disease characterized by wheezing, coughing.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate candidiasis.
- Asthmatic patients often use a combination of inhalational drugs and orally administered drugs. Inhalation propellants may dry oral tissues when used chronically.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.

Oral Health Education

- Advise patient to rinse mouth with water after bronchodilator use to prevent dryness.
- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.
- Encourage patient to follow daily plaque control procedures for effective self-care.

tipranavir (tye-PRA-na-vir)

Aptivus

Drug Class: Protease inhibitor

PHARMACOLOGY

Action

Tipranavir is a nonpeptide protease inhibitor that prevents formation of mature virions by inhibiting virus-specific processing of the viral Gag and Gag-Pol polyproteins in HIV-1–infected cells.

Uses

In combination with ritonavir 200 mg for the treatment of HIV-1–infected adult patients with evidence of viral replication who are highly treatment-experienced or have HIV-1 strains resistant to multiple protease inhibitors.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

The following adverse reactions were reported in patients receiving tipranavir/ritonavir:

⚠ **ORAL:** Reactivation of herpes simplex.

CNS: Fatigue (4%); headache (3%); asthenia, depression (2%); insomnia (1%); decreased appetite, dizziness, intracranial hemorrhage, malaise, peripheral neuropathy, sleep disorder, somnolence (less than 2%).

GI: Diarrhea (11%); nausea (7%); abdominal pain, vomiting (3%); abdominal distension, anorexia, dyspepsia, flatulence, gastroesophageal reflux disease, pancreatitis (less than 2%).

RESP: Bronchitis (3%); cough (1%); dyspnea (less than 2%).

MISC: Pyrexia (5%); hypersensitivity, influenza-like illness, reactivation of varicella zoster (less than 2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 are reported; elective dental treatment should be delayed until blood values improve above this level.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Consider medical consult to determine disease control and influence on dental treatment.
- Anticipate oral candidiasis when HIV disease is reported.
- If GI side effects occur, consider semisupine chair position.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Recommend frequent maintenance prophylaxis when immunosuppression is evident.
- Encourage daily plaque control procedures for effective self-care because HIV infection reduces host resistance.

tizanidine HCl (tye-ZAN-i-deen HIGH-droe-KLOR-ide)

Zanaflex

Sirdalud

Drug Class: Skeletal muscle relaxant, centrally acting

PHARMACOLOGY

Action

Unknown; may increase presynaptic inhibition of motor neurons.

Uses

Acute and intermittent management of increased muscle tone associated with spasticity.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (49%).
CNS: Somnolence; dizziness; dyskinesia; nervousness; depression; anxiety; paresthesia.
CVS: Orthostatic hypotension (1%).
GI: Constipation; vomiting; abdominal pain; diarrhea; dyspepsia.
RESP: Sinusitis; pneumonia; bronchitis.
MISC: Asthenia; increased spasm or tone; flu-like syndrome; infection; speech disorder; myasthenia; back pain; fever; allergic reaction; malaise; abscess; neck pain; cellulitis.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- *For back pain:* Consider semisupine chair position for patient comfort.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Determine need for power toothbrush for self-care.

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tolazamide (tole-AZE-uh-mid)

Tolinase

Drug Class: Antidiabetic, sulfonylurea

PHARMACOLOGY

Action

Decreases blood glucose by stimulating release of insulin from pancreas.

Uses

Adjunct to diet to lower blood glucose in patients with type 2 diabetes mellitus whose hyperglycemia cannot be controlled by diet alone.

Unlabeled Uses

Temporary adjunct to insulin therapy in selected patients with type 2 diabetes mellitus to improve diabetic control.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Taste alteration; thirst.
CNS: Dizziness; vertigo.
CVS: Hypertension; syncope.

GI: Nausea; epigastric fullness; heartburn; cholestatic jaundice.
MISC: Disulfiram-like reaction; weakness; paresthesia; fatigue; malaise; leukopenia; thrombocytopenia; agranulocytosis; hemolytic anemia.

CLINICAL IMPLICATIONS

General

- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated; however, antibiotic therapy in patients with poorly controlled diabetes has been shown to improve disease control and improve response after periodontal debridement.
- Monitor blood pressure because hypertension and dyslipidemia (CAD) are prevalent in DM.
- *Loss of blood sugar control:* Certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (e.g., corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Observe for signs of hypoglycemia (e.g., confusion, argumentativeness, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- Ensure patient has taken medication and eaten meal.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Oral Hypoglycemic Drugs" in Chapter 6: *Clinical Medicine*.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- Medical consult advised if fasting blood glucose is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- *If insulin is used:* Consider time of peak hypoglycemic effect.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Place patient on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.
- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.

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tolbutamide (tole-BYOO-tuh-mide)

Orinase, Orinase Diagnostic

Apo-Tolbutamide, Novo-Butamide

Artosin, Diaval, Rastinon

Drug Class: Antidiabetic, sulfonylurea

PHARMACOLOGY

Action

Decreases blood glucose by stimulating release of insulin from the pancreas.

Uses

ORAL FORM: Adjunct to diet to lower blood glucose in patients with type 2 diabetes mellitus whose hyperglycemia cannot be controlled by diet alone.
IV FORM (TOLBUTAMIDE SODIUM): Aid in diagnosis of pancreatic islet cell adenoma.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Taste alteration; thirst.

CNS: Dizziness; vertigo.

CVS: Hypertension; syncope.

GI: Nausea; epigastric fullness; heartburn.

MISC: Disulfiram-like reaction; weakness; paresthesia; fatigue; malaise; slight burning sensation along course of vein during IV injection; thrombophlebitis with thrombosis of injected vein; leukopenia; thrombocytopenia; agranulocytosis; hemolytic anemia.

CLINICAL IMPLICATIONS

General

- Determine degree of disease control and current blood sugar levels. Goals should be <120 mg/dL and A1C <7%. A1C levels ≥8% indicate significant uncontrolled diabetes.
- The routine use of antibiotics in the dental management of diabetic patients is not indicated; however, antibiotic therapy in patients with poorly controlled diabetes has been shown to improve disease control and improve response following periodontal debridement.
- Monitor blood pressure because hypertension and dyslipidemia (CAD) are prevalent in DM.
- *Loss of blood sugar control:* certain medical conditions (e.g., surgery, fever, infection, trauma) and drugs (such as corticosteroids) affect glucose control. In these situations, it may be necessary to seek medical consultation before surgical procedures.
- Obtain patient history regarding diabetic ketoacidosis or hypoglycemia with current drug regimen.
- Observe for signs of hypoglycemia (e.g., confusion, argumentativeness, perspiration, altered consciousness). Be prepared to treat hypoglycemic reactions with oral glucose or sucrose.
- Ensure patient has taken medication and eaten meal.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Oral Hypoglycemic Drugs" in Chapter 6: *Clinical Medicine*.
- Determine ability to adapt to stress of dental treatment. Consider short, morning appointments.
- Medical consult advised if fasting blood glucose is <70 mg/dL (hypoglycemic risk) or >200 mg/dL (hyperglycemic crisis risk).
- If insulin is used: consider time of peak hypoglycemic effect.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Place patient on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.
- Explain role of diabetes in periodontal disease and the need to maintain effective plaque control and disease control.
- Advise patient to bring data on blood sugar values and A1C levels to dental appointments.

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tolcapone (TOLE-kah-pone)

Tasmar

Drug Class: Antiparkinson

PHARMACOLOGY

Action

The exact mechanism of action is unknown. Inhibits catechol-*O*-methyl transferase (COMT), thus blocking the degradation of catechols including dopamine and levodopa. This may lead to more sustained levels of dopamine and consequently a more prolonged antiparkinsonian effect.

Uses

As an adjunct to levodopa/carbidopa for the management of signs and symptoms of Parkinson disease.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (6%).

CNS: Sleep disorder; excessive dreaming; somnolence; confusion; dizziness; headache; hallucination; dyskinesia; dystonia; fatigue; balance loss; hyperkinesia; paresthesia; hypokinesia; agitation; irritability; mental deficiency; hyperactivity; panic reaction; euphoria; hypertonia.

CVS: Orthostatic hypotension; chest pain; hypotension.

GI: Nausea; diarrhea; vomiting; constipation; abdominal pain; dyspepsia; flatulence.

RESP: URI; dyspnea; sinus congestion.

MISC: Muscle cramps; anorexia; falling; increased sweating; rhabdomyolysis; stiffness; arthritis; neck pain; influenza; burning; malaise; fever.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Extrapyramidal behaviors associated with Parkinson disease can complicate access to oral cavity and complicate oral procedures.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur, consider semisupine chair position.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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tolmetin sodium (TOLE-mee-tin SO-dee-uhm)

Drug Class: Analgesic; NSAID

PHARMACOLOGY

Action

Decreases inflammation, pain, and fever, probably through inhibition of COX activity and prostaglandin synthesis.

Uses

Treatment of chronic and acute rheumatoid arthritis and osteoarthritis and juvenile rheumatoid arthritis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Glossitis; stomatitis; mouth ulcers.

CNS: Dizziness; drowsiness; lightheadedness; confusion; increased sweating; vertigo; headache; nervousness; migraine; anxiety; aggravated Parkinson disease or epilepsy; paresthesia; peripheral neuropathy; myalgia; fatigue; asthenia; depression.

CVS: Hypertension.

MISC: Agranulocytosis; thrombocytopenia; hemolytic anemia.

GI: Nausea; dyspepsia; abdominal pain or discomfort; flatulence; diarrhea; constipation; vomiting; gastritis; anorexia; peptic ulcer; GI distress.

RESP: Bronchospasm; laryngeal edema; rhinitis; dyspnea; pharyngitis; hemoptysis; shortness of breath.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- *Arthritis:* Consider patient comfort and need for semisupine chair position.
- Monitor vital signs.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.

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tolterodine tartrate (tole-THE-roe-deen TAR-trait)

Detrol, Detrol LA

Unidet

Detrusitol

Drug Class: Urinary tract product; Muscarinic antagonist

PHARMACOLOGY

Action

Antagonizes muscarinic receptor, which mediates urinary bladder contraction and salivation.

Uses

Treatment of overactive bladder with symptoms of urinary frequency, urgency, or urge incontinence.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (37%).

CNS: Headache; somnolence; paresthesia, nervousness (immediate-release); dizziness, anxiety (extended-release).

GI: Constipation; abdominal pain; dyspepsia; flatulence, vomiting, nausea (immediate-release).

RESP: Bronchitis; coughing.

MISC: Chest pain; infection; fungal infection; falls (immediate-release); fatigue (extended-release).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Anticholinergics have strong xerostomic effects. Anticipate increased caries activity and candidiasis.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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topiramate (toe-PEER-ah-mate)

Topamax

Drug Class: Anticonvulsant

PHARMACOLOGY

Action

Precise mechanism is unknown but topiramate may block repetitively elicited action potentials, affect ability of chloride ion to move into neurons, and antagonize an excitatory amino acid receptor.

Uses

Adjunctive therapy for partial onset seizures; primary generalized tonic-clonic seizures; seizures associated with Lennox-Gastaut syndrome.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (4%); gingivitis; candidiasis; taste perversion.

CNS: Dizziness (32%); fatigue (30%); somnolence (29%); psychomotor slowing (21%); nervousness, paresthesia (19%); ataxia (16%); difficulty with memory, confusion, difficulty with concentration (14%); speech disorders/related speech problems, depression (13%); nystagmus (11%); language problems (10%); tremor, mood problems (9%); abnormal coordination (4%); agitation, aggressive reaction, apathy, emotional lability, abnormal gait (3%); hypesthesia, depersonalization, decreased libido, involuntary muscle contractions, stupor, vertigo (2%); hypertonia, hallucination, euphoria, psychosis, headache, anxiety, convulsions, insomnia, suicide attempt (≥1%).

GI: Nausea, anorexia (12%); dyspepsia, abdominal pain (7%); constipation, gastroenteritis (2%); GI disorder (1%); diarrhea, vomiting (≥1%).

RESP: Rhinitis (7%); sinusitis (6%); dyspnea (2%); coughing, URI (≥1%).

MISC: Asthenia (6%); back pain (5%); chest pain, flu-like symptoms, leg pain (4%); myalgia, epistaxis, hot flashes, infection, viral infection, allergy (2%); fever, pain (≥1%); edema; body odor, rigors, skeletal pain (1%); pancreatitis.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Determine level of disease control, type and frequency of seizures, and compliance with medication regimen.
- If GI side effects occur, consider semisupine chair position.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education
- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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torsemide (TORE-suh-MIDE)

Demadex

Drug Class: Loop diuretic

PHARMACOLOGY

Action
Inhibits sodium/potassium/chloride carrier system in ascending loop of Henle, resulting in increased urinary excretion of sodium, chloride, and water. Does not significantly alter glomerular filtration rate, renal plasma flow, or acid-base balance.

Uses
Management of edema associated with CHF, cirrhosis, and renal disease; treatment of hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
CNS: Headache; dizziness; asthenia; insomnia; nervousness; syncope.
CVS: Hypotension; tachycardia.
GI: Diarrhea; constipation; nausea; dyspepsia; GI hemorrhage; rectal bleeding.
RESP: Rhinitis; cough increase.
MISC: Arthralgia; myalgia; photosensitivity; hypokalemia.

CLINICAL IMPLICATIONS

General
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Monitor pulse rhythm to assess for electrolyte imbalance.
- Place patient on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education
- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.

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tramadol HCl (TRAM-uh-dole HIGH-droe-KLOR-ide)

Ultram: Tablets: 50 mg

Nobligan, Prontofort, Tradol

Drug Class: Analgesic

PHARMACOLOGY

Action

Binds to certain opioid receptors and inhibits reuptake of norepinephrine and serotonin; exact mechanism of action unknown.

Uses

Relief of moderate to moderately severe pain.

Contraindications

Acute intoxication with alcohol, hypnotics, centrally acting analgesics, opioids, or psychotropic agents.

Usual Dosage

ADULTS AND CHILDREN 16 YR AND OLDER: *PO:* Start with 25 mg/day in the morning and titrate in 25 mg increments as separate doses q 3 days to reach 100 mg/day (25 mg qid). Thereafter, increase the dose by 50 mg as tolerated q 3 days to reach 200 mg/day (50 mg qid). After titration, administer 50 to 100 mg q 4 to 6 hr as needed for pain relief (max, 400 mg/day).
ELDERLY (OVER 65 YR): *PO:* Start with low end of dosing (max, 300 mg/day in patients 75 yr and older).
RENAL IMPAIRMENT (CCR LESS THAN 30 ML/MIN): *PO:* Increase the dosing interval to 12 hr (max, 200 mg/day).
HEPATIC IMPAIRMENT: *PO:* 50 mg q 12 hr.

Pharmacokinetics

ABSORP: Mean absolute bioavailability of tramadol is 75%. Food has no effect. T_{max} is 2 to 3 hr. Steady-state plasma concentration of both tramadol and the metabolite are achieved within 2 days.
DIST: Tramadol is 20% protein bound and is independent of concentrations up to 10 mcg/mL. Vd is approximately 2.7 L/kg. Tramadol follows linear kinetics.
METAB: There is no evidence of self-induction. Production of M1 (metabolite) is dependent on cytochrome P450 CYP2D6. The *O*-demethylated metabolite is M1. Tramadol is extensively metabolized after administration. The major metabolic pathway is *N*- and *O*-demethylation and glucuronidation or sulfation in liver.
EXCRET: 30% of a dose is excreted in urine unchanged; 60% is excreted as metabolites. The $t_{1/2}$ is 6.3 hr for tramadol and 7.4 hr for the metabolite.
ONSET: The onset of action is 1 hr.
PEAK: Time to peak effect is 2 to 3 hr.
SPECIAL POP: *Renal failure:* In patients with renal impairment, there is a decreased rate and extent of excretion of tramadol and M1. In patients with Ccr less than 30 mL/min, dose adjustment is recommended.
Hepatic failure: Metabolism of tramadol and M1 is reduced in patients with advanced cirrhosis. In all patients with cirrhosis, dose adjustment is recommended.
Elderly: In patients older than 75 yr, dose adjustment is recommended.

DRUG INTERACTIONS

Warfarin: Bleeding into skin (mechanism unknown)
- Avoid concurrent use.

Antidepressants, tricyclic: Increased risk of seizure (additive proconvulsants)
- Avoid concurrent use.

Carbamazepine: Decreased tramadol effect (increased metabolism)
- Avoid concurrent use.

Citalopram: Increased risk of seizure (additive proconvulsants)
- Avoid concurrent use.

Fluoxetine: Increased risk of seizure (additive proconvulsants)
- Avoid concurrent use.

Fluvoxamine: Increased risk of seizure (additive proconvulsants)
- Avoid concurrent use.

Monoamine oxidase inhibitors: Increased risk of serotonin syndrome (reduced uptake of monoamines)
- Avoid concurrent use.

Olanzapine: Possible increased risk of serotonin syndrome (mechanism unknown)
- Monitor clinical status.

Ondansetron: Possible decreased tramadol analgesia (antagonism at serotonin receptors)
- Monitor clinical status.

Paroxetine: Increased risk of seizure (additive proconvulsants)
- Avoid concurrent use.

Sertraline: Serotonin syndrome (additive serotonergic effect)
- Avoid concurrent use.

Increased risk of seizure (additive proconvulsants)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (10%).
CVS: Vasodilation (5%); orthostatic hypotension (1%); tachycardia.
CNS: Dizziness/vertigo; headache; somnolence; stimulation; anxiety; confusion; coordination disturbances; euphoria; nervousness; sleep disorder; seizures.
GI: Nausea; diarrhea; constipation; vomiting; dyspepsia; abdominal pain; anorexia; flatulence.
MISC: Asthenia; hypertonia.

CLINICAL IMPLICATIONS

General

- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.

When prescribed by DDS:
- Short-term use only; there is no justification for long-term use in the management of dental pain.
- *Lactation:* Excreted in breast milk.
- *Children:* Not recommended for children younger than 16 yr.
- *Elderly:* In elderly patients older than 75 yr, concentrations may be slightly elevated; may have less ability to tolerate adverse effects; use reduced dosage.
- *Hypersensitivity:* Serious and, rarely, fatal anaphylactoid reactions may occur.
- *Renal failure:* Dosage adjustments may be required.
- *Hepatic failure:* Dosage adjustments may be required in patients with cirrhosis.
- *CNS depressants:* Use with caution and reduce dosage when administering to patients receiving CNS depressants or SSRIs.
- *Drug abuse:* May induce psychic and physical dependence of the morphine type. Do not use in opioid dependent patients.
- *MAO inhibitors (e.g., isocarboxazid):* Use with great caution in patients taking MAO inhibitors.
- *Opioid dependence:* Not recommended for patients who are opioid dependent; use caution when administering to patients who have recently received substantial amounts of opioids.
- *Respiratory depression:* Use with caution.
- *Seizures:* Seizures may occur within the recommended dosage range.
- *Withdrawal:* If tramadol is discontinued abruptly, withdrawal symptoms may occur.
- *Overdosage:* Respiratory depression, seizures, vomiting.

Pregnancy Risk Category: Category C.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

When prescribed by DDS:
- Warn patient not to drink alcoholic products while taking the drug.
- Inform patient not to drive, sign important papers, or operate mechanical equipment while taking drug.
- May produce sedation and interfere with eye-hand coordination and the ability to operate mechanical equipment.
- Instruct patient to take the prescribed dose at the recommended intervals.
- Inform patient to check with health care provider first before taking any OTC or prescription medications, including analgesics.
- Have patient report any serious side effects to health care provider.
- Advise patient not to wait until pain level is high to self-medicate, because drug will not be as effective.
- Advise patient to avoid using alcohol or other CNS depressants (e.g., sleeping pills).
- Advise the patient that this medication may cause drowsiness and to use caution while driving or using heavy equipment or performing other tasks requiring mental alertness.
- Advise patient to notify health care provider if the pain is not relieved by the medication at the prescribed dosage.

trandolapril (tran-DOE-lah-prill)

Mavik

Gopten

Drug Class: Antihypertensive; Angiotensin converting enzyme (ACE) inhibitor

PHARMACOLOGY

Action

Reduces the formation of the vasopressor hormone angiotensin II by inhibiting ACE. Results in decreased BP and reduced sodium reabsorption and potassium retention.

Uses

HEART FAILURE POST-MI/LEFT VENTRICULAR DYSFUNCTION POST-MI: For stable patients who have evidence of left ventricular systolic dysfunction (identified by wall motion abnormalities) or who are symptomatic from CHF within the first few days after sustaining acute MI. HYPERTENSION: Treatment of hypertension either alone or in combination with other antihypertensive drugs.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)
- Monitor blood pressure.

ADVERSE EFFECTS

CNS: Dizziness (23%).
CVS: Bradycardia; hypotension; syncope.
GI: Dyspepsia (6%); gastritis (4%); diarrhea (1%).
RESP: Cough (35%).
MISC: Asthenia (3%); angioedema (0.13%); anaphylactoid reactions; leukopenia; thrombocytopenia.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictors with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.

- If coughing is problematic, consider semisupine chair position for treatment.
- Susceptible patient with DM may experience severe recurrent hypoglycemia.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Place on frequent maintenance schedule to avoid periodontal inflammation.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.

tranexamic acid (tran-ex-AM-ik AS-id)

Cyklokapron: Injection: 100 mg per mL; Tablets: 500 mg

Drug Class: Hematological agent

PHARMACOLOGY

Action

Exerts an antifibrinolytic effect by reversibly blocking the lysine-binding sites on plasminogen molecules.

Uses

Hemorrhage: For short-term use (from 2 to 8 days) in hemophilia patients to reduce or prevent hemorrhage, and to reduce the need for replacement therapy during and following tooth extraction.

Unlabeled Uses

Topically as a mouthwash to reduce bleeding after oral surgery in patients receiving anticoagulant therapy. The drug also inhibits induced hyperfibrinolysis during thrombolytic treatment with plasminogen activators.

Tranexamic acid has been used for many hemostatic purposes including prevention of bleeding after surgery or trauma (e.g., tonsillectomy and adenoidectomy, prostatic surgery, cervical conization), and to prevent rebleeding of subarachnoid hemorrhage.

It has also been used to treat primary or IUD-induced menorrhalgia, gastric and intestinal hemorrhage, recurrent epistaxis, and hereditary angioneurotic edema.

Contraindications

ACQUIRED DEFECTIVE COLOR VISION: Prohibits measuring one end-point of toxicity.

SUBARACHNOID HEMORRHAGE: Cerebral edema and cerebral infarction may be caused by tranexamic acid in patients with subarachnoid hemorrhage.

Usual Dosage

Hemophilia

INJECTABLE OR ORAL FORMULATION

ADULTS: Immediately before surgery, substitution therapy is given with tranexamic acid, 10 mg/kg IV. After surgery, give 25 mg/kg orally 3 to 4 times daily for 2 to 8 days. *Alternative:* Give 25 mg/kg orally, 3 to 4 times per day beginning 1 day prior to surgery.

Oral mucosal or alveolar bleeding

INJECTABLE FORMULATION USED AS A RINSE

Tranexamic acid mouthwash is not commercially available in Canada or the United States; it can be extemporaneously prepared by compounding pharmacist using the commercial tablets or injection. Because stability data for aqueous solution are lacking, compounded solutions should be freshly prepared.

ADULTS AND CHILDREN: Rinse with 5 mL 4 times a day as needed to control bleeding; expectorate, do not swallow.

Pharmacokinetics
ABSORP: Bioavailability 30% to 50%.
DIST: Low protein binding (<3%).
METAB: Little metabolism.
EXCRET: Kidney.
PEAK: 3 hr.

DRUG INTERACTIONS
Retinoic acid: Fatal thromboembolism (mechanism unknown)
- Avoid concurrent use.

ADVERSE EFFECTS
CNS: IV: Giddiness.
CVS: IV: Hypotension has been observed when IV injection is too rapid. Do not inject more rapidly than 1 mL/min; this reaction has not been reported with oral use.
GI: TAB: Nausea, vomiting, and diarrhea occur, but disappear when dosage is reduced.

CLINICAL IMPLICATIONS
General
- *Lactation:* Tranexamic acid is present in breast milk at 1% of the corresponding serum levels. Exercise caution when administering during lactation.

Pregnancy Risk Category: Category B.

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tranylcypromine sulfate (tran-ill-SIP-row-meen SULL-fate)
Parnate

Drug Class: Antidepressant, MAO inhibitor

PHARMACOLOGY
Action
Tranylcypromine blocks activity of enzyme MAO, thereby increasing monoamine (e.g., epinephrine, norepinephrine, serotonin) concentrations in CNS.

Uses
Treatment of reactive depression.

Unlabeled Uses
Bulimia; treatment of panic disorders with associated agoraphobia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Tramadol: Increased risk of serotonin syndrome (reduced uptake of monoamines)
- Avoid concurrent use.

Sympathomimetic amines: Severe hypertension (additive)
- Monitor blood pressure.

ADVERSE EFFECTS
⚠ **ORAL:** Dry mouth.
CNS: Dizziness; headache; sleep disturbances; tremors; hyperreflexion; manic symptoms; muscle twitching; convulsions; vertigo; confusion; memory impairment; toxic delirium; hypomania; coma.
CVS: Postural hypotension, syncope, tachycardia, palpitation.
GI: Constipation; nausea; diarrhea; anorexia; abdominal pain.
MISC: Edema, weight gain, chills; anemia, agranulocytosis, leukopenia, thrombocytopenia.

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Consider implications of condition on dental treatment.

- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Monitor vital signs.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- If GI side effects occur consider semisupine chair position.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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trazodone HCl (TRAY-zoe-dohn HIGH-droe-KLOR-ide)

Alti-Trazodone, Alti-Trazodone Dividose, Apo-Trazodone, Apo-Trazodone D, Gen-Trazodone, Novo-Trazodone, Nu-Trazodone, Nu-Trazodone-D, PMS-Trazodone, ratio-Trazodone

Drug Class: Antidepressant

PHARMACOLOGY

Action

Undetermined; may affect serotonin uptake at presynaptic neuronal membrane.

Uses

Treatment of depression.

Unlabeled Uses

Treatment of neurogenic pain, aggression, panic disorder, cocaine withdrawal.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (34%); unpleasant taste.

CNS: Anger; hostility; nightmares/vivid dreams; confusion; disorientation; decreased concentration; dizziness; drowsiness; excitement; fatigue; headache; insomnia; impaired memory; nervousness; tingling; tremors; convulsions; incoordination; paresthesia; agitation; anxiety; grand mal seizures; hallucinations/delusions.

CVS: Hypotension, syncope; cardiac arrest; cardiospasm; cerebrovascular accident.

GI: Abdominal/gastric disorders; nausea; vomiting; diarrhea; constipation; flatulence.

MISC: Hypersensitivity reaction (e.g., skin conditions, edema, rash, itching, purpura); muscle aches and pains; decreased appetite; sweating; changes in weight; malaise; allergic skin condition/edema; nasal/sinus congestion; akathisia; allergic reaction; alopecia; anemia; aphasia; apnea; ataxia; chills; cholestasis; clitorism; diplopia; extrapyramidal symptoms; hematuria; hemolytic anemia; hirsutism; hyperbilirubinemia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Monitor vital signs.

- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage daily plaque control procedures for effective, nontraumatic self-care.

tretinoin (TREH-tih-NO-in)

Synonyms: trans-retinoic acid; vitamin A acid

Avita, Renova, Retin-A, Retin-A Micro, Vesanoid

Retisol-A, Stieva-A

Drug Class: Retinoids

PHARMACOLOGY

Action

TOPICAL: Decreases cohesiveness and stimulates mitotic activity and turnover of follicular epithelial cells, resulting in decreased formation and increased extrusion of comedones. PO: Induces maturation of acute promyelocytic leukemia cells. When given PO, time to reach peak concentration is between 1 and 2 hr. Tretinoin is more than 95% bound in plasma, predominantly to albumin. CYP450 enzymes have been implicated in the oxidative metabolism of tretinoin.

Uses

Topical treatment of acne vulgaris; as an adjunctive agent for use in the mitigation of fine wrinkles, mottled hyperpigmentation, and tactile roughness of facial skin. PO treatment for acute promyelocytic leukemia.

Unlabeled Uses

Treatment of skin cancer; various dermatological conditions including lamellar ichthyosis, warts, and Darier disease.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth and lips; mucositis.
CNS: Fatigue; weakness; headache; fever; malaise; dizziness; anxiety; paresthesia; insomnia; depression; confusion; agitation; hallucination; severe headache may be more common in children; cerebral hemorrhage; intracranial hypertension; pseudotumor cerebri.
CVS: Arrhythmia (23%); hypotension (14%); hypertension (11%); cardiac failure (6%).
GI: Nausea and vomiting; elevated LFTs; GI hemorrhage; abdominal pain; diarrhea; anorexia; constipation; dyspepsia.
RESP: Upper and lower respiratory tract disorders; dyspnea; pleural effusion.
MISC: Retinoic acid-acute promyelocytic leukemia syndrome, characterized by fever, dyspnea, weight gain, radiographic pulmonary infiltrates, and pleural or pericardial effusions; infections; photosensitivity.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.

- Consider medical consult to determine disease control and influence on dental treatment.
- Monitor blood pressure and pulse (capsules).
- Advise products for palliative relief of oral manifestations (e.g., stomatitis, mucositis, xerostomia, etc.)
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Do not prescribe drugs with the potential for additive photosensitivity, risk of phototoxicity (cream).

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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triamcinolone (TRY-am-SIN-oh-lone)

(triamcinolone acetonide, triamcinolone diacetate, triamcinolone hexacetonide)

Aristocort: Tablets: 4 mg; Ointment: 0.1%; Cream: 0.025, 0.1, 0.5%
Aristospan Intra-articular: Injection: 20 mg/mL suspension
Aristospan Intralesional: Injection: 5 mg/mL suspension
Azmacort: Aerosol: 100 mcg/actuation (Inhaler contains 60 mg)
Kenalog: Ointment: 0.025, 0.1%; Cream: 0.025, 0.5%; Aerosol: 2 sec. Spray
Kenalog-10: Injection: 10 mg/mL suspension
Kenalog-40, Amcort, Cinacort, Triam Forte, Trilone, Tristoject: Injection: 40 mg/mL suspension
Kenalog-H, Triacet, Triderm: Cream: 0.1%
Kenalog in Orabase: Paste: 0.1%
Nasacort AQ: Spray: 55 mcg/actuation
Nasacort HFA: Aerosol: 55 mcg/actuation
Tac-3: Injection: 3-mg/mL suspension

Aristospan, Oracort, Aristocort Parenteral, Aristocort Syrup

Kenacort, Ledercort, Triamsicort, Zamacort

Drug Class: Corticosteroid

PHARMACOLOGY

Action

Anti-inflammatory effect by depressing formation, release, and activity of endogenous mediators of inflammation including prostaglandins, kinins, histamine, liposomal enzymes, and complement system. Also modifies body's immune response.

Uses

PO/IM/IV administration: Replacement therapy in endocrine disorders; adjunctive therapy for short-term administration in rheumatic disorders; maintenance therapy or control of exacerbation of collagen diseases; treatment of dermatological diseases; control of allergic states; management of allergic and inflammatory ophthalmic processes; treatment of respiratory diseases, including pulmonary emphysema and diffuse interstitial pulmonary fibrosis; treatment of selected hematological disorders; palliative management of selective neoplastic diseases; induction of diuresis in edematous states caused by nephrotic syndrome or refractory CHF, and in ascites caused by cirrhosis; control of exacerbation in selected GI diseases (e.g., inflammatory bowel disease); control of exacerbation of multiple sclerosis; adjunctive treatment of tuberculous meningitis; treatment of trichinosis with neurologic or myocardial involvement; management of postoperative dental inflammatory reactions.
Intra-articular or soft tissue administration: Short-term adjunctive therapy in synovitis of osteoarthritis, rheumatoid arthritis, bursitis, acute gouty arthritis, epicondylitis, acute nonspecific tenosynovitis, posttraumatic osteoarthritis.

Intralesional administration: Management of keloids; treatment of localized hypertrophic, infiltrated, inflammatory lesions of lichen planus, psoriatic plaques, granuloma annulare, lichen simplex chronicus; treatment of discoid lupus erythematosus, necrobiosis lipoidica diabeticorum, alopecia areata, cystic tumors of aponeurosis or tendon.
Topical application: Relief of inflammatory and pruritic manifestations of corticosteroid-responsive dermatoses.
Oral inhalation: Maintenance treatment of asthma as prophylactic therapy; use in asthma patients requiring systemic corticosteroid administration.
Intranasal administration: Relief of seasonal and perennial allergic rhinitis symptoms.

Contraindications

Systemic fungal infections; IM use in idiopathic thrombocytopenic purpura; administration of live virus vaccines; topical monotherapy in primary bacterial infections; topical use on face, groin, or axilla; oral inhalation as primary treatment for status asthmaticus or other acute episodes of asthma; intranasal administration in untreated localized infections involving nasal mucosa.

Usual Dosage

TRIAMCINOLONE

ADULTS: *PO:* 4 to 100 mg/day.
CHILDREN: *PO:* 0.117 to 1.66 mg/kg/day.

TRIAMCINOLONE ACETONIDE

ADULTS AND CHILDREN: *Topical:* Apply sparingly bid to qid.

DRUG INTERACTIONS

No documented drug-drug interactions (topical use). The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, throat; oral candidiasis (inhalation); stinging (cream); masking of infection.
CVS: Edema; thromboembolism or fat embolism; thrombophlebitis; necrotizing angiitis; cardiac arrhythmias or ECG changes; syncopal episodes; hypertension; myocardial rupture; CHF.
CNS: Convulsions; pseudotumor cerebri; vertigo; headache; neuritis; paresthesias; psychosis.
GI: Pancreatitis; nausea; vomiting; increased appetite and weight gain; peptic ulcer; bowel perforation.
RESP: Wheezing (oral).
MISC: Musculoskeletal effects (e.g., weakness, myopathy, muscle mass loss, osteoporosis, spontaneous fractures); endocrine abnormalities (e.g., menstrual irregularities, cushingoid state, growth suppression in children, sweating, decreased carbohydrate tolerance or hyperglycemia, glycosuria, increased insulin or sulfonylurea requirements in diabetic patients, hirsutism); anaphylactoid or hypersensitivity reactions; aggravation or masking of infections; osteonecrosis, tendon rupture, infection, skin atrophy, postinjection flare, hypersensitivity, facial flushing (intra-articular); may cause adverse effects similar to systemic use because of absorption (topical).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Be aware that signs of bacterial oral infection may be masked and anticipate oral candidiasis.
- *Osteoporosis:* Patient may be high-risk candidate for pathological fractures or jaw fractures during extractions.
- Place patient on frequent maintenance schedule to avoid periodontal inflammation.

- Anticipate Addisonian or cushingoid complications affecting the head and neck area (tablet).
- Despite the anticipated perioperative physiological stress (i.e., minor surgical stress), patients undergoing dental care under local anesthesia should take only their usual daily glucocorticoid dose before dental intervention. No supplementation is justified.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis (inhalation).

When used or prescribed by DDS:

- *Lactation:* Undetermined.
- *Children:* Children may be more susceptible to adverse effects from topical use.
- *Hypersensitivity:* Reactions, including anaphylaxis, may occur.
- *Overdosage:* Moon face, central obesity, striae, hirsutism, acne, ecchymoses, hypertension, osteoporosis, myopathy, sexual dysfunction, hyperglycemia, hyperlipidemia, peptic ulcer, electrolyte and fluid imbalance (excessive or long-term use).

Pregnancy Risk Category: Category C (oral inhalation/nasal/topical).

Oral Health Education

- Teach patient to rinse mouth and gargle vigorously with water after inhaled steroid use to minimize the potential for candidiasis (inhalation).

When used or prescribed by DDS:

- Explain name, dose, action, and potential side effects of drug.
- Advise patient to read the *Patient Information* leaflet before starting therapy and again with each refill.
- Advise patient to continue taking other medications for same condition as prescribed by health care provider.
- Explain that effects of drug are not immediate. Benefit requires daily use as instructed and usually begins to occur within 1 or 2 days, but full benefit may take 1 to 2 wk, depending on the condition being treated and the dose and route of administration of medication being used.
- Caution patient not to decrease the dose or stop using the drug unless advised by health care provider.
- Caution patient not to increase dose but to inform health care provider if symptoms do not seem to be improving or are worsening.
- Advise women to notify health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Caution patient not to take any prescription or OTC medications, dietary supplements, or herbal preparations unless advised by health care provider.
- Advise patient that follow-up visits may be required to monitor therapy and to keep appointments.
- *Dental paste:* Teach patient proper technique for applying the paste: press a small dab (about 1/4 in) on the lesion until a thin film develops. Caution patient not to rub the paste into the lesion.
- Advise patient to apply at bedtime if being used once a day and after meals if being used more than once a day.
- Advise patient to stop using and inform health care provider if any of the following local reactions occur: burning, itching, new blistering or peeling, irritation, new sores.

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triamterene (try-AM-tur-een)

Dyrenium

Drug Class: Diuretic, potassium-sparing

PHARMACOLOGY

Action

Interferes with sodium reabsorption at distal renal tubule, resulting in increased excretion of sodium and water and decreased excretion of potassium.

Uses

Treatment of edema associated with CHF, hepatic cirrhosis, and nephrotic syndrome; treatment of steroid-induced edema, idiopathic edema, and edema caused by secondary hyper-

aldosteronism; management of hypertension in patient with diuretic-induced hypokalemia or at risk of hypokalemia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Weakness; fatigue; dizziness; headache.

GI: Diarrhea; nausea; vomiting.

MISC: Anaphylaxis; muscle cramps; photosensitivity; thrombocytopenia; megaloblastic anemia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Monitor pulse rhythm to assess for electrolyte imbalance.
- Chronic dry mouth is possible; anticipate increased caries activity, candidiasis, and lichenoid mucositis.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Place patient on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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triazolam (try-AZE-oh-lam)

Halcion

Alti-Triazolam, APO-Triazo, Gen-Triazolam

Drug Class: Sedative and hypnotic, benzodiazepine

DEA Schedule: Schedule IV (Canada: Schedule F)

PHARMACOLOGY

Action

Potentiates action of GABA (gamma-aminobutyric acid), an inhibitory neurotransmitter, resulting in increased neuronal inhibition and CNS depression, especially in limbic system and reticular formation.

Uses

Treatment of insomnia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Clarithromycin: Possible triazolam toxicity (decreased metabolism)

- Avoid concurrent use.

T

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; taste disturbance; stomatitis; glossitis.

CNS: Anterograde amnesia; headache; nervousness; drowsiness; confusion; talkativeness; apprehension; irritability; euphoria; weakness; tremor; incoordination; memory impairment; depression; ataxia; dizziness; dreaming/nightmares; hallucinations; paradoxical reactions (e.g., anger, hostility, mania, muscle spasms).

CVS: Palpitations, tachycardia.

GI: Heartburn; nausea; vomiting; diarrhea; constipation; anorexia.

MISC: Dependence/withdrawal syndrome (e.g., confusion, abnormal perception of movement, depersonalization, muscle twitching, psychosis, paranoid delusions, seizures). Rebound sleep disorder (recurrence of insomnia worse than before treatment) may occur during first 3 nights after abrupt discontinuation; leukopenia, granulocytopenia.

CLINICAL IMPLICATIONS

General

- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Encourage patient to follow daily plaque control procedures for effective self-care.

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trifluoperazine HCl (try-flew-oh-PURR-uh-zeen HIGH-droe-KLOR-ide)

Trifluoperazine HCl

Apo-Trifluoperazine

Drug Class: Antipsychotic, phenothiazine

PHARMACOLOGY

Action

Effects apparently related to dopamine receptor blocking in CNS.

Uses

Management of schizophrenia; short-term treatment (<12 wk) of nonpsychotic anxiety.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Tardive dyskinesia; dry mouth; tongue protrusion.

CNS: Lightheadedness; faintness; headache; weakness; tremor; fatigue; slurring of speech; insomnia; sedation; vertigo; seizures; twitching; ataxia; drowsiness; lethargy; paradoxical excitement; pseudoparkinsonism; motor restlessness; oculogyric crises; opisthotonos; hyperreflexia; dizziness; dystonia.

CVS: Hypotension.

GI: Dyspepsia; constipation; adynamic ileus (may result in death); nausea; anorexia.

RESP: Laryngospasm; bronchospasm; shortness of breath.

MISC: Increases in appetite and weight; polydipsia; heat-related illness; neuroleptic malignant syndrome; elevated prolactin levels; blood dyscrasias (e.g., anemia, leukopenia, thrombocytopenia, others).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.

- Clients with psychological disease may present with behavior management problems.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Monitor vital signs.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- Encourage patient to follow daily plaque control procedures for effective self-care.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

trimethobenzamide hydrochloride (try-meth-oh-BEN-zuh-mide HIGH-droe-KLOR-ide)

Tigan

Drug Class: Anticholinergic

PHARMACOLOGY

Action

Believed to directly affect medullary chemoreceptor trigger zone to inhibit nausea.

Uses

Prevention and treatment of nausea and vomiting.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.
CVS: Hypotension (after injection).
CNS: Mood depression; disorientation; headache; drowsiness; dizziness; seizures; coma; Parkinson-like symptoms.
GI: Diarrhea.
MISC: Local pain, burning, stinging, redness, and swelling (after injection); hypersensitivity reactions; muscle cramps.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Anticholinergics have strong xerostomic effects. Anticipate increased caries activity and candidiasis.

Oral Health Education

- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.

trimethoprim/sulfamethoxazole (try-METH-oh-prim/suhl-fuh-meth-OX-uh-zole)

Synonyms: co-trimoxazole; sulfamethoxazole/trimethoprim; TMP-SMZ

Bactrim, Bactrim D.S., Bactrim IV, Bactrim Pediatric, Cotrim, Cotrim D.S., Cotrim Pediatric, Septra, Septra DS, Sulfatrim, Uroplus DS, Uroplus SS

Apo-Sulfatrim, Bactrim Roche, Novo-Trimel, Novo-Trimel D.S., Nu-Cotrimox, Septra Injection

Drug Class: Anti-infective

T

PHARMACOLOGY

Action

Sulfamethoxazole (SMZ) inhibits bacterial synthesis of dihydrofolic acid by competing with PABA. Trimethoprim (TMP) blocks production of tetrahydrofolic acid by inhibiting the enzyme dihydrofolate reductase. This combination blocks two consecutive steps in bacterial biosynthesis of essential nucleic acids and proteins and is usually bactericidal.

Uses

PO/PARENTERAL: Treatment of UTIs caused by susceptible strains of bacteria, shigellosis enteritis, and *Pneumocystis carinii* pneumonitis.
PO: Treatment of acute otitis media and acute exacerbations of chronic bronchitis; treatment of traveler's diarrhea.

Unlabeled Uses

Treatment of cholera, salmonella-type infections, and nocardiosis; prevention of recurrent UTIs in women; prophylaxis of bacterial infections in susceptible patients; treatment of prostatitis; prophylaxis of *Pneumocystis carinii* pneumonitis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Glossitis; stomatitis.
CNS: Headache; mental depression; ataxia, tinnitus; vertigo.
GI: Nausea; vomiting; anorexia.
RESP: Pulmonary congestion.
MISC: Allergic skin reactions (e.g., rash, urticaria); arthralgia; myalgia; agranulocytosis; thrombocytopenia; leukopenia; hemolytic anemia; hyperkalemia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

Oral Health Education

- Encourage daily plaque control procedures for effective, nontraumatic self-care.

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trovafloxacin mesylate/alatrofloxacin mesylate

(TROE-vah-FLOX-ah-sin MEH-sih-LATE/al-at-row-FLOX-ah-sin)

Synonym: alatrofloxacin mesylate/trovafloxacin mesylate

Trovan

Drug Class: Antibiotic, fluoroquinolone

PHARMACOLOGY

Action

The intravenous (IV) form is rapidly converted to trovafloxacin, which interferes with microbial DNA synthesis.

Uses
Treatment of nosocomial pneumonia, community-acquired pneumonia, complicated intra-abdominal infections, complicated skin and skin structure infections, and gynecological and pelvic infections caused by susceptible organisms.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
CNS: Headache; dizziness; lightheadedness.
GI: Nausea; diarrhea; vomiting; abdominal pain.
MISC: Application/injection/insertion site reaction (IV use).

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- If prescribed by the DDS, ensure patient knows how to take the drug and how long it should be taken, and to immediately report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset). See Chapter 4: *Medical Management of Odontogenic Infections*.
- Antibiotic-associated diarrhea can occur. Have patient contact DDS immediately if signs develop.
- Prolonged use of antibiotics may result in bacterial or fungal overgrowth of nonsusceptible microorganisms; anticipate candidiasis.

valacyclovir HCl (val-lay-SIGH-kloe-vihr HIGH-droe-KLOR-ide)

Valtrex: Tablets: 500 mg, 1 g
Drug Class: Anti-infective; Antiviral

PHARMACOLOGY
Action
Converted to acyclovir, which then inhibits viral DNA replication by interfering with viral DNA polymerase.

Uses
Treatment of herpes zoster (shingles); treatment or suppression of genital herpes; treatment of herpes labialis (cold sores).

Contraindications
Hypersensitivity or intolerance to valacyclovir, acyclovir, or any component of the formulation.

Usual Dosage
Herpes zoster
ADULTS: *PO:* 1 g tid for 7 days (initiate therapy within 48 hr of onset of rash).
HIV-infected patients
ADULTS: *PO:* 500 mg bid for HIV-infected patients with CD_4 cell count of at least 100 cells/mm^3 (efficacy beyond 6 mo of therapy has not been established).
Herpes labialis
ADULTS: *PO:* 2 g bid for 1 day approximately 12 hr apart, initiated at earliest symptoms of cold sore (e.g., tingling, burning, itching).

Pharmacokinetics
ABSORP: Rapidly absorbed from the GI tract. Bioavailability is about 55%. C_{max} is less than 0.5 mcg/mL.

DIST: Extensive tissue distribution.
METAB: Converted to acyclovir and L-valine by first-pass intestinal or hepatic metabolism.
EXCRET: About 46% is recovered in urine. About 47% is recovered in feces.
SPECIAL POP: *Renal failure:* Dose reduction is recommended.
Elderly: Dose modification may be necessary in geriatric patients with reduced renal function.

DRUG INTERACTIONS

Ceftriaxone: Possible increased risk of renal toxicity (mechanism unknown)
- Avoid concurrent use or monitor renal function.

Meperidine: Meperidine toxicity (decreased renal excretion)
- Monitor clinical status.

Probenecid: Possible valacyclovir toxicity (decreased renal excretion)
- Avoid concurrent use or monitor renal function.

Theophylline: Possible theophylline toxicity (decreased metabolism)
- Avoid concurrent use or monitor theophylline concentration.

Zidovudine: Severe drowsiness and lethargy (mechanism unknown)
- Monitor clinical status.

ADVERSE EFFECTS

CVS: Hypertension; tachycardia.
CNS: Headache (38%); depression (7%); dizziness (4%); aggressive behavior; agitation; ataxia; coma; confusion; decreased consciousness; dysarthria; encephalopathy; mania; psychosis (including audio and visual hallucinations); seizures.
GI: Nausea (15%); abdominal pain (11%); vomiting (6%); diarrhea.
MISC: Arthralgia (6%); acute hypersensitivity reactions (e.g., anaphylaxis, angioedema, dyspnea, pruritus, rash, urticaria); facial edema; leukocytoclastic vasculitis; photosensitivity; leukopenia; thrombocytopenia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- If GI side effects occur, consider semisupine chair position.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

When prescribed by DDS:

- Ensure patient knows how to take the drug, how long it should be taken, and to immediately report adverse effects (e.g., rash, difficult breathing, diarrhea, GI upset). See Chapter 4: *Medical Management of Odontogenic Infections*.
- *Lactation:* Undetermined.
- *Children:* Safety and efficacy not established.
- *Elderly:* Dosage reduction may be necessary, depending on underlying renal status.
- *Renal failure:* Dosage reduction is recommended; exercise caution when giving valacyclovir to patients with renal impairment or those receiving potentially nephrotoxic drugs.
- *Immunocompromised patients:* Valacyclovir is not indicated for use in immunocompromised patients.
- *Thrombotic thrombocytopenic purpura/hemolytic uremic syndrome:* May occur and has resulted in death in patients with advanced HIV disease and also in allergenic bone marrow and renal transplant recipients receiving 8 g/day of valacyclovir.
- *Overdosage:* Acute renal failure, anuria.

Pregnancy Risk Category: Category B.

Oral Health Education

- Advise patient to initiate treatment at the earliest sign of oral herpetic symptoms.
- Recommend that toothbrush be replaced following clearance of oral infection.

When used or prescribed by DDS:

- Explain name, dose, action, and potential side effects of drug.
- Review dose and appropriate dosing schedule depending on condition being treated (e.g., shingles, cold sores, or genital herpes). Instruct patient to take medication exactly as prescribed and not to stop taking or change the dose unless advised by health care provider.
- Advise patient that medication can be taken without regard to meals but to take with food if stomach upset occurs.
- Remind patient using medication for cold sores that it is not a cure and to initiate therapy at the first symptom of a cold sore (e.g., tingling, itching, burning). Remind patient that treatment should not exceed two doses taken about 12 hr apart.
- Advise patient to contact health care provider if medication does not seem to be controlling lesions and/or symptoms or if intolerable side effects develop.
- Caution patient to avoid unnecessary exposure to UV light (i.e., sunlight, tanning booths) and to use sunscreen and wear protective clothing until tolerance is determined.
- Advise women to contact health care provider if pregnant, planning to become pregnant, or breast-feeding.
- Instruct patient not to take any prescription or OTC medications or dietary supplements unless advised by health care provider.
- Advise patient that follow-up visits may be necessary to monitor therapy and to keep appointments.

valproic acid and derivatives (VAL-pro-ik acid)

Synonyms: divalproex sodium; sodium valproate

Depacon, Depakene, Depakote, Depakote ER

Alti-Valproic, Apo-Divalproex, Apo-Valproic, Epiject, Gen-Valproic, Novo-Divalproex, Novo-Valproic, Nu-Divalproex, Nu-Valproic, PMS-Valproic Acid, ratio-Valproic, Rhoxal-valproic, Rhoxal-valproic EC

Atemperator-S, Cryoval, Depakene, Epival, Leptilan, Valprosid

Drug Class: Anticonvulsant

PHARMACOLOGY

Action

Believed to work by increasing brain levels of gamma-aminobutyric acid (GABA). It may also inhibit catabolism of GABA, potentiate postsynaptic GABA responses, and affect potassium channels or directly stabilize membranes.

Uses

Sole and adjunctive therapy in simple (petit mal) and complex absence seizures; adjunctive therapy in multiple seizure types, including absence seizures; monotherapy and adjunctive therapy in complex partial seizures that occur in isolation or with other seizure types; manic episodes associated with bipolar disorder (divalproex sodium delayed-release tablets); prophylaxis of migraine headaches (divalproex sodium delayed-release and extended-release [ER] tablets).

Unlabeled Uses

Treatment of atypical absence, myoclonic, and tonic-clonic (grand mal) seizures and atonic, elementary partial, and infantile spasm seizures; prevention of recurrent pediatric febrile seizures; intractable status epilepticus in patients who have not responded to other therapies; treatment of minor incontinence after ileoanal anastomosis (subchronic administration); management of anxiety disorders and panic attacks.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Aspirin: Possible valproate toxicity (displacement from protein binding)
- Avoid concurrent use.

Clonazepam: May precipitate absence status (mechanism unknown)
- Avoid concurrent use.

Diazepam or midazolam: Possible IV diazepam or midazolam toxicity (displacement from protein binding)
- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, glossitis, periodontal abscess, stomatitis, tooth disorder, tardive dyskinesia (1% to 5%).

CNS: Tremor (57%); somnolence (30%); asthenia (21%); dizziness (18%); insomnia (15%); nervousness (11%); amnesia (7%); headache (5% or more); depression (5%); ataxia, emotional lability, abnormal thinking, paresthesia (1% to 5%); anxiety, confusion, abnormal gait, hypertonia, incoordination, abnormal dreams, personality disorder, agitation, catatonic reaction, dysarthria, hallucinations, hypokinesia, increased reflexes, speech disorder, vertigo (>1% but <5%).

GI: Nausea (34%); diarrhea, vomiting (23%); dyspepsia (13%); abdominal pain (12%); anorexia (11%); increased appetite (6%); constipation (1% to 5%); flatulence, hematemesis, eructation, fecal incontinence, gastroenteritis, GI disorder (>1% but <5%).

RESP: Infection (20%); flu-like syndrome (12%); rhinitis; dyspnea (1% to 5%); epistaxis, pneumonia, sinusitis, increased cough (>1% but <5%).

MISC: Infection (15%); back pain (8%); injection site pain (3%); injection site reaction (2%); fever, chest pain, vasodilation, peripheral edema, accidental injury, chills, face edema, viral infection (1% to 5%); malaise (>1% but <5%); lupus erythematosus; anaphylaxis.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Determine level of disease control, type, and frequency of seizure and compliance with medication regimen.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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valsartan (VAL-sahr-tan)

Diovan

Drug Class: Antihypertensive; Angiotensin II antagonist

PHARMACOLOGY

Action

Antagonizes the effects of angiotensin II (vasoconstriction and aldosterone secretion) by blocking the angiotensin II receptor (AT_1 receptor) in vascular smooth muscle and the adrenal gland, producing decreased BP.

Uses

Treatment of hypertension either alone or in combination with other antihypertensive drugs; heart failure.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (<1%).

CNS: Headache; dizziness; fatigue.

GI: Abdominal pain; diarrhea; nausea.

RESP: Cough (infrequent).

MISC: Fatigue; viral infection; edema; arthralgia.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Place patient on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.

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valsartan/hydrochlorothiazide (VAL-sahr-tan/ HIGH-droe-klor-oh-THIGH-uh-zide)

Synonym: hydrochlorothiazide/valsartan

Diovan HCT

Drug Class: Antihypertensive combination

PHARMACOLOGY

Action

VALSARTAN: Antagonizes the effects of angiotensin II (vasoconstriction and aldosterone secretion) by blocking the angiotensin II receptor (AT_1 receptor) in vascular smooth muscle and the adrenal gland, producing decreased BP.

HYDROCHLOROTHIAZIDE (HCTZ): Increases chloride, sodium, and water excretion by interfering with transport of sodium ions across renal tubular epithelium.

Uses

Treatment of hypertension.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

COX-1 inhibitors: Decreased antihypertensive effect (decreased prostaglandin synthesis)

- Monitor blood pressure.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Headache; fatigue; dizziness; increased appetite; anxiety; insomnia; decreased libido; paresthesia; somnolence; asthenia.

CVS: Postural hypotension.

GI: Diarrhea; constipation; dyspepsia; flatulence; nausea; abdominal pain; vomiting. HCTZ: Pancreatitis; sialadenitis; cramping; gastric irritation.

RESP: Cough; URI; dyspnea; epistaxis; bronchitis.

MISC: Viral infection; back pain; chest pain; allergic reaction; anaphylaxis; asthenia; dependent edema; arthralgia; muscle cramps; muscle weakness; arm pain; leg pain; angioedema. HCTZ: Hypersensitivity (e.g., purpura, photosensitivity, urticaria, necrotizing angiitis, fever, respiratory distress, anaphylactic reactions).

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Monitor pulse rhythm to assess for electrolyte imbalance.
- Chronic dry mouth is possible; anticipate increased caries, candidiasis, and lichenoid mucositis.
- *Postural hypotension:* Monitor BP at the beginning and end of each appointment; anticipate syncope. Have patient sit upright for several min at the end of the dental appointment before dismissing.
- Place patient on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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vancomycin (van-koe-MY-sin)

Lyphocin, Vancocin, Vancoled

Balcoran, Vancocin, Vanmicina

Drug Class: Anti-infective; Antibiotic

PHARMACOLOGY

Action

Inhibits bacterial cell wall synthesis and alters cell-membrane permeability and RNA synthesis.

Uses

PARENTERAL: Treatment of serious or severe infections due to susceptible bacteria not treatable with other antimicrobials (such as *Staphylococcus*).

ORAL: Treatment of pseudomembranous colitis caused by *Clostridium difficile*; treatment of staphylococcal enterocolitis.

Unlabeled Uses

IV prophylaxis against bacterial endocarditis in penicillin-allergic patients.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CVS: Hypotension (IV route).

GI: Nausea.

RESP: Wheezing; dyspnea.

MISC: Anaphylaxis; drug fever; chills; red person syndrome (hypotension with or without rash over face, neck, upper chest, and extremities – IV route); neutropenia, thrombocytopenia.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- If oral infection occurs that requires antibiotic therapy, select an appropriate product from a different class of anti-infectives.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.

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vardenafil HCl (var-DEN-ah-fil HIGH-droe-KLOR-ide)

Levitra

Drug Class: Agent for impotence

PHARMACOLOGY

Action

Enhances the effect of nitric oxide at the nerve ending and endothelial cells in the corpus cavernosum by inhibiting phosphodiesterase type 5 in the corpus cavernosum of the penis. This results in vasodilation, increased inflow of blood into the corpora cavernosa, and ensuing penile erection upon sexual stimulation.

Uses

Treatment of erectile dysfunction.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole or itraconazole: Possible vardenafil toxicity (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; dysphagia; esophagitis.

CNS: Headache (15%); dizziness (2%); hypertonia, hypesthesia, insomnia, paresthesia, somnolence, vertigo (<2%).

GI: Dyspepsia (4%); nausea (2%); abdominal pain, diarrhea, gastritis, gastroesophageal reflux, vomiting, gamma-glutamyl-transpeptidase increase (<2%).

RESP: Dyspnea, epistaxis (<2%).

MISC: Flushing (11%); accidental injury, flu-like syndrome (3%); anaphylactic reactions, asthenia, face edema, pain; photosensitivity (<2%).

CLINICAL IMPLICATIONS

General

- Concurrent administration with nitroglycerin may lead to severe hypotension. Avoid concurrent use.
- Monitor vital signs because of potential CV effects.

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varenicline (var-e-NI-kleen)

Chantix

Drug Class: Smoking deterrent

PHARMACOLOGY

Action

Binds with high affinity and selectivity to neuronal nicotinic acetylcholine receptors, which produces agonist activity while preventing nicotine binding to receptors.

Uses

Aid to smoking cessation.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (6%); gingivitis, thirst (at least 1%).

CVS: Hypertension (at least 1%).

CNS: Headache, insomnia (19%); abnormal dreams (13%); dysgeusia (8%); fatigue/malaise/asthenia (7%); sleep disorder (5%); increased appetite (4%); somnolence (3%); decreased appetite, lethargy, nightmare (2%); anxiety, depression, disturbances in attention, dizziness, emotional disorder, irritability, restlessness, sensory disturbance (at least 1%).

GI: Nausea (30%); flatulence (9%); constipation (8%); abdominal pain (7%); dyspepsia, vomiting (5%); gastroesophageal reflux disease (1%); diarrhea.

RESP: Upper respiratory tract disorder (7%); dyspnea (2%); epistaxis (at least 1%).

MISC: Chest pain, influenza-like illness, edema (at least 1%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs. Use of tobacco is associated with cardiovascular disease.
- Perform oral cancer examination because of increased risk with tobacco use.
- If GI side effects occur, consider semisupine chair position.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- *When prescribed by dentist:* Monitor for suicidal behaviors during therapy.

Oral Health Education

- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.
- Encourage patient to follow daily plaque control procedures for effective self-care.
- *When prescribed by dentist:* Warn patient to notify dentist if abnormal impulses or feelings of suicidal behavior develop.

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venlafaxine (VEN-luh-fax-EEN)

Effexor, Effexor XR

Effexor

Drug Class: Antidepressant

PHARMACOLOGY

Action

Potentiates norepinephrine, serotonin, and dopamine neurotransmitter activity in CNS.

Uses

Treatment of depression; generalized anxiety disorder (Effexor XR).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Alprazolam: Possible decreased alprazolam effect (mechanism unknown)

- Monitor clinical status.

Sympathomimetic amines: Possible increased risk of serotonin syndrome (additive)

- Monitor clinical status.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (22%).

CNS: Headache (34%); nervousness (32%); somnolence (26%); dizziness (24%); insomnia (23%); asthenia (17%); anxiety (11%); tremor (10%); decreased libido (9%); abnormal

dreams (7%); agitation (4%); depression, hypertonia, paresthesia (3%); twitching, abnormal thinking, confusion (2%); depersonalization (1%); migraine, trismus, vertigo, emotional lability, amnesia, hypesthesia (≥1%); catatonia; delirium; extrapyramidal symptoms; neuroleptic malignant syndrome–like events; involuntary movements; serotonin syndrome; shock-like electrical sensations; panic.

CVS: Increased blood pressure.

GI: Nausea (58%); anorexia (20%); constipation (15%); diarrhea, vomiting, abdominal pain (8%); dyspepsia (7%); flatulence (3%).

RESP: Dyspnea (≥1%).

MISC: Yawn (8%); chills (7%); infection, flu-like syndrome (6%); accidental injury (5%); chest pain, trauma (2%); arthralgia (≥1%); congenital anomalies; night sweats; pancreatitis; hemorrhage; anaphylaxis; renal failure; rhabdomyolysis; pulmonary eosinophilia; increased prolactin.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Depressed or anxious patients may neglect self-care. Monitor for plaque control effectiveness.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Monitor vital signs.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present, consult with MD to consider medication changes.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- Encourage daily plaque control procedures for effective self-care.

verapamil HCl (veh-RAP-uh-mill HIGH-droe-KLOR-ide)

Calan, Calan SR, Covera-HS, Isoptin, Isoptin SR, Verapamil, Verelan, Verelan PM

Alti-Verapamil, APO-Verap, Chronovera, Gen-Verapamil, Gen-Verapamil SR, Isoptin I.V., Novo-Veramil, Novo-Veramil SR, Nu-Verap

Chronovera, Dilacoran, Veraken, Verdilac

Drug Class: Calcium channel blocker

PHARMACOLOGY

Action

Inhibits movement of calcium ions across cell membrane resulting in depression of mechanical contraction of myocardial and vascular smooth muscle and depression of impulse formation (automaticity) and conduction velocity.

Uses

ORAL: Treatment of vasospastic (Prinzmetal variant), chronic stable (classic effort-associated), and unstable (crescendo, preinfarction) angina; adjunctive treatment with digitalis to control ventricular rate at rest and during stress in atrial flutter or fibrillation; prophylaxis of repetitive PSVT; management of essential hypertension.

SUSTAINED-RELEASE: Management of essential hypertension.

PARENTERAL: Rapid conversion of PSVTs to sinus rhythm; temporary control of rapid ventricular rate in atrial flutter or fibrillation.

Unlabeled Uses

Treatment of migraine and cluster headaches; treatment of hypertrophic cardiomyopathy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Fluconazole, ketoconazole, or itraconazole: Possible verapamil toxicity (decreased metabolism)
- Avoid concurrent use.

Aspirin: Increased antiplatelet effect (additive)
- Avoid concurrent use.

Midazolam: Marked increased in midazolam effect (decreased metabolism)
- Avoid concurrent use.

Bupivacaine: Severe hypotension and bradycardia (mechanism unknown)
- Avoid concurrent use.

Clarithromycin: Cardiovascular toxicity (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth; gingival hyperplasia.

CNS: Dizziness; lightheadedness; headache; asthenia.

CVS: Hypotension (2.5%).

MISC: Increased bleeding (antiplatelet effect).

GI: Nausea; constipation.

RESP: Shortness of breath; dyspnea; wheezing.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse pressure, rate, and rhythm) at each appointment to assess disease control. Do not provide elective dental treatment when BP is ≥180/110 or in the presence of other high-risk CV conditions. Refer to the section entitled "The Patient Taking Cardiovascular Drugs" in Chapter 6: *Clinical Medicine*.
- Use local anesthetic agents with vasoconstrictor with caution based on functional capacity of the patient and use aspirating technique to prevent intravascular injection.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Anticipate increased bleeding during procedures that result in bleeding.
- Anticipate gingival hyperplasia; consider MD consult to recommend different drug regimen if periodontal health is compromised.
- Place on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.

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vitamin E

Synonyms: d-alpha tocopherol; d-alpha tocopheryl acetate

Aquavit E, Dry E 400, Vitaplus E, d'ALPHA E Softgels, Vitamin E

Drug Class: Vitamin supplement

PHARMACOLOGY

Action

Assists in digestion and metabolism of polyunsaturated fats; reduces platelet aggregation to decrease blood clot formation.

Uses

Vitamin E deficiency; hemolytic anemia in premature neonates.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Increased bleeding (doses higher than 3000 international units).

CLINICAL IMPLICATIONS

General

- Inquire about daily doses that have been consumed to determine potential risks of bleeding and possible CV effects.

Oral Health Education

- High doses of vitamin E have not been shown to protect against CVD. Evidence suggests high doses may precipitate CV events.

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voriconazole (vore-ih-KOE-nuh-zole)

Vfend

Drug Class: Anti-infective; Antifungal

PHARMACOLOGY

Action

Inhibition of fungal cytochrome P450–mediated 14 alpha-lanosterol demethylation, an essential step in fungal ergosterol biosynthesis.

Uses

Treatment of invasive aspergillosis; treatment of *Scedosporium apiospermum* and *Fusarium* spp., including *F. solani*, in patients intolerant of or refractory to other therapy; treatment of esophageal candidiasis.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (2%).
CNS: Hallucinations (5%); headache (4%); dizziness (3%).
GI: Nausea (7%); vomiting (6%); diarrhea (2%).
MISC: Fever (6%); chills (4%); abdominal pain (3%); chest pain (2%); photosensitivity.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- Monitor body temperature to determine disease control.
- This drug is used relatively short term; therefore, oral side effects generally do not contribute to oral disease.

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warfarin (WORE-fuh-rin)

Coumadin

Apo-Warfarin, Gen-Warfarin, Taro-Warfarin

Dimantil

Drug Class: Anticoagulant

PHARMACOLOGY

Action

Interferes with hepatic synthesis of vitamin K–dependent clotting factors, causing in vivo depletion of clotting factors II, VII, IX, and X.

Uses

Prophylaxis and treatment of venous thrombosis and its extension; prophylaxis and treatment of atrial fibrillation with embolization; prophylaxis and treatment of pulmonary embolism; adjunct in prophylaxis of systemic embolism after MI.

Unlabeled Uses

Prevention of recurrent transient ischemic attacks and reduction of risk of recurrent MI; adjunctive treatment of small cell carcinoma of lung.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Acetaminophen: Increased dose-dependent anticoagulant effect (mechanism not established)
- Monitor clinical status.

COX-1 inhibitors: Increased bleeding (platelet inhibition)
- Avoid concurrent use.

Fluconazole or ketoconazole: Increased anticoagulant effect (decreased metabolism)
- Avoid concurrent use or monitor INR.

Clarithromycin: Increased anticoagulant effect (decreased metabolism)
- Avoid concurrent use.

Doxycycline: Increased anticoagulant effect (mechanism unknown)
- Avoid concurrent use.

Metronidazole: Increased anticoagulant effect (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Increased bleeding, difficulty swallowing; hemorrhage.
CNS: Dizziness; fatigue.
CVS: Hypotension, unexplained shock.
GI: Nausea; vomiting; diarrhea; paralytic ileus; intestinal obstruction; anorexia; abdominal cramps.
RESP: Shortness of breath.
MISC: Fever; cholesterol microembolization (purple toe syndrome); hypersensitivity.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine prothrombin time or INR before completing procedures that may result in significant bleeding. Safe levels of INR for invasive dental procedures is 2–3. INR is calculated from PT. INR ≤3.5 safe for periodontal debridement.
- Monitor frequently to ensure adequate clotting during treatment that involves bleeding.

Oral Health Education

- Advise patient that gingival bleeding may be a sign of excessive dosage and M.D. should be consulted, as well as INR lab values considered.
- Encourage daily plaque control procedures for effective self-care in patient at risk for CV disease.

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zafirlukast (zah-fur-LOO-cast)

Accolate

Drug Class: Leukotriene receptor antagonist

PHARMACOLOGY

Action

Inhibits three leukotriene receptor types. Leukotrienes have been associated with the longer inflammatory component of asthma.

Uses

Prophylaxis and chronic treatment of asthma in adults and children 5 yr of age and older.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Aspirin: Possible zafirlukast toxicity with high doses of aspirin (decreased metabolism)

- Avoid high doses of aspirin.

ADVERSE EFFECTS

CNS: Headache (13%); dizziness (2%).
GI: Nausea, diarrhea (3%); vomiting (2%); dyspepsia (1%).
MISC: Infection (4%); pain, asthenia, abdominal pain, accidental injury, fever, back pain (2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP, pulse rate, respiratory rate and function); uncontrolled disease characterized by wheezing and coughing.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.
- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Asthmatics often use a combination of inhalational drugs and orally administered drugs. Inhalation propellants may dry oral tissues when used chronically.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Instruct patient to bring bronchodilator to each dental appointment.

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zalcitabine (zal-SITE-uh-BEAN)

Synonyms: dideoxycytidine; ddC

Hivid

Drug Class: Antiretroviral, nucleoside reverse transcriptase inhibitor

PHARMACOLOGY

Action

Inhibits replication of DNA in HIV.

Uses

Combination Therapy: For the treatment of selected patients with advanced HIV infection.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth, glossitis, oral or esophageal ulceration.
CNS: Headache; dizziness; confusion; impaired concentration; peripheral neuropathy.
GI: Pancreatitis; nausea; dysphagia; anorexia; abdominal pain; vomiting; diarrhea; dyspepsia.
RESP: Nasal discharge; cough; respiratory distress.
MISC: Myalgia; arthralgia; foot pain; fatigue; anaphylactoid reaction; abnormal gamma glutamyl transferase (GGT).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- Consider medical consult to determine disease control and influence on dental treatment.
- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 is reported; elective dental treatment should be delayed until blood values are above this level.
- Anticipate oral candidiasis when HIV disease is reported.
- Place on frequent maintenance schedule to avoid periodontal inflammation.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI or respiratory side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care because HIV infection reduces host resistance.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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zaleplon (ZAL-eh-plahn)

Sonata

Sotacor

Drug Class: Sedative and hypnotic

PHARMACOLOGY

Action

Interacts with the gamma-aminobutyric acid receptor complex.

Uses

Short-term treatment of insomnia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Benzodiazepines: Increased risk of CNS depression (additive)
- Monitor clinical status; advise patient.

Tramadol: Increased risk of CNS depression (additive)
- Monitor clinical status; advise patient.

Zolpidem: Increased risk of CNS depression (additive)
- Monitor clinical status; advise patient.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.

CNS: Depression; hypertonia; nervousness; abnormal thinking; headache; anxiety; amnesia; dizziness; depersonalization; hallucinations; hypesthesia; paresthesia; somnolence; tremor; vertigo.

GI: Constipation; anorexia; colitis; dyspepsia; nausea.

RESP: Bronchitis; epistaxis.

MISC: Back pain; chest pain; migraine; arthritis; abdominal pain; asthenia; fever; malaise; peripheral edema.

CLINICAL IMPLICATIONS

General

- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Consider semisupine chair position if back pain or GI effects are problematic.

Oral Health Education
- If chronic dry mouth occurs, recommend salivary stimulants, home fluoride therapy, and use of nonalcoholic oral health care products.

zanamivir (za-NA-mi-veer)
Relenza

Drug Class: Antiviral agent

PHARMACOLOGY
Action
Inhibition of influenza virus neuraminidase, with the possibility of alteration of virus particle aggregation and release.

Uses
Uncomplicated acute illness caused by influenza A and B virus in adults and pediatric patients at least 7 yr of age who have been symptomatic for no longer than 2 days.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS
⚠ **ORAL:** Oropharyngeal edema (allergic manifestation).
CNS: Headache, dizziness (2%); seizures.
GI: Diarrhea, nausea (3%); vomiting (1%); abdominal pain (<1.5%).
RESP: Sinusitis (3%); bronchitis, cough (2%); bronchospasm; dyspnea.
MISC: Malaise, fatigue, fever (<1.5%); allergic or allergy-like reactions.

CLINICAL IMPLICATIONS
General
- Determine why drug is being taken. Take precautions to avoid cross-contamination of microorganisms.
- Monitor vital signs, including body temperature to assess disease control.

zidovudine (zid-OH-vue-deen)
Synonyms: azidothymidine; AZT; compound S

Retrovir

APO-Zidovudine, Novo-AZT

Dipedyne, Isadol, Kenamil, Retrovir AZT

Drug Class: Antiretroviral, nucleoside reverse transcriptase inhibitor

PHARMACOLOGY
Action
Inhibits replication of retroviruses including HIV.

Uses
In combination with other antiretroviral agents for the treatment of HIV infections; prevention of maternal-fetal HIV transmission.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS
Fluconazole: Possible zidovudine toxicity (decreased metabolism)
- Avoid concurrent use.

Clarithromycin: Possible decreased zidovudine effect (mechanism unknown)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Gingival bleeding; mouth ulceration; tongue or lip edema; dysphagia.
CNS: Headache; dizziness; insomnia; paresthesia; malaise; asthenia; decreased reflexes; nervousness or irritability.
GI: Anorexia; constipation; dyspepsia; nausea; vomiting; flatulence; rectal hemorrhage; eructation; abdominal pain.
RESP: Dyspnea; cough; epistaxis; pharyngitis; rhinitis; sinusitis; hoarseness.
MISC: Fever, diaphoresis; myalgia; arthralgia; muscle spasm; body odor; chills; flu-like syndrome; hyperalgesia; abdominal/back/chest pain; hypersensitivity reaction; anemia, neutropenia (infants).

CLINICAL IMPLICATIONS

General

- This drug is frequently prescribed in combination with one or more other antiviral agents. Side effects of all agents must be considered during the drug review process.
- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Consider medical consult to determine disease control and influence on dental treatment.
- Antibiotic prophylaxis should be considered when <500 PMN/mm^3 is reported; elective dental treatment should be delayed until blood values improve above this level.
- Anticipate oral candidiasis when HIV disease is reported.
- Blood dyscrasias rarely reported; anticipate increased bleeding, infection, and poor healing.
- Place patient on frequent maintenance schedule to avoid periodontal inflammation.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care because HIV infection reduces host resistance.

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zileuton (zill-LOO-tuhn)

Zyflo CR

Drug Class: Leukotriene receptor antagonist

PHARMACOLOGY

Action

Attenuates bronchoconstriction by inhibiting leukotriene-dependent smooth muscle contractions.

Uses

Prophylaxis and chronic treatment of asthma.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

CNS: Pain; dizziness; insomnia; somnolence; malaise; nervousness; hypertonia.
GI: Abdominal pain; dyspepsia; nausea; vomiting; constipation; flatulence.
MISC: Asthenia; myalgia; arthralgia; chest pain; fever; lymphadenopathy; muscle rigidity; pruritus.

CLINICAL IMPLICATIONS

General

- Monitor vital signs (e.g., BP, pulse rate, respiratory rate and function); uncontrolled disease characterized by wheezing and coughing.
- Acute bronchoconstriction can occur during dental treatment; have bronchodilator inhaler available.

- Be aware that sulfites in local anesthetic with vasoconstrictor can precipitate acute asthma attack in susceptible individuals.
- Asthmatics often use a combination of inhalational drugs and orally administered drugs. Inhalation propellants may dry oral tissues when used chronically.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.
- Instruct patient to bring bronchodilator to each dental appointment.

ziprasidone (zi-PRAH-si-done)

Geodon

Drug Class: Atypical antipsychotic, benzisoxazole

PHARMACOLOGY

Action

Antipsychotic activity, apparently because of dopamine and serotonin receptor antagonism.

Uses

Treatment of schizophrenia; treatment of acute manic or mixed episodes associated with bipolar disorder; treatment of acute agitation in schizophrenic patients (injection only).

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole: Possible ziprasidone toxicity (decreased metabolism)

- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth (5%); tongue edema (3%); increased salivation (dose related); tooth disorder (IM route).

CNS: Extrapyramidal symptoms, somnolence (31%); headache (18%); dizziness (16%); akathisia (10%); dystonia (4%); hypertonia (3%); speech disorder (2%); agitation, tremor, dyskinesia, hostility, paresthesia, confusion, vertigo, hypokinesia, hyperkinesias, abnormal gait, hypesthesia, ataxia, amnesia, cogwheel rigidity, delirium, hypotonia, akinesia, dysarthria, withdrawal syndrome, buccoglossal syndrome, choreoathetosis, incoordination, neuropathy (≥1%); anxiety, tremor (dose related); headache, insomnia, personality disorder, psychosis, speech disorder (IM).

GI: Nausea (10%); constipation (9%); dyspepsia (8%); diarrhea, anorexia (2%); vomiting (≥1%).

RESP: Respiratory disorder (e.g., cold symptoms, URI [8%]); increased cough (3%); dyspnea (≥1%).

MISC: Asthenia (6%); accidental injury (4%); myalgia (2%); abdominal pain, flu-like syndrome, fever, accidental fall, face edema, chills, photosensitivity reaction, flank pain, hypothermia, motor vehicle accident (≥1%); arthralgia (dose related); injection site pain, back pain (IM).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Clients with psychological disease may present with behavior management problems.
- Extrapyramidal behaviors can complicate performance of oral procedures. If present consult with MD to consider medication changes.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- If GI side effects occur, consider semisupine chair position.

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.
- Evaluate manual dexterity; consider need for power toothbrush.

zoledronic acid (zoe-leh-DROE-nik AS-id)

Reclast, Zometa

Drug Class: Bisphosphonate

PHARMACOLOGY

Action

Inhibition of bone resorption.

Uses

Treatment of hypercalcemia of malignancy; treatment of patients with multiple myeloma and bone metastases from solid tumors in conjunction with standard antineoplastic therapy.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Sore throat; candidiasis; stomatitis; mucositis; dysphagia.

CNS: Agitation; anxiety; asthenia; confusion; decreased appetite; depression; dizziness; fatigue; headache; hypoesthesia; insomnia; paresthesia; somnolence.

GI: Abdominal pain; anorexia; constipation; diarrhea; dyspepsia; nausea; vomiting.

RESP: Coughing; dyspnea; pleural effusion; URI.

MISC: Aggravated malignant neoplasm; chest pain; chills; edema of lower limb; fever; flu-like syndrome; leg edema; metastases; nonspecific infection; progression of cancer; weakness.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Patient may be high-risk candidates for pathological fractures or jaw fractures during extractions.
- Osteonecrosis of the jaw is reported; consider this adverse drug effect when osteolytic disease is suspected or when surgical procedures are indicated.
- Advise products for palliative relief of oral manifestations (e.g., stomatitis, mucositis, xerostomia).

Oral Health Education

- Encourage daily plaque control procedures for effective self-care.
- Consult with oncologist to determine whether alternative oral physiotherapy devices are appropriate to reduce risk of trauma to oral tissues.

zolmitriptan (ZOLE-mih-TRIP-tan)

Zomig, Zomig, Zomig ZMT

Zomig Rapimelt

Drug Class: Analgesic; Migraine

PHARMACOLOGY

Action

Selective agonist for the vascular serotonin (5-HT) receptor subtype, causing vasoconstriction of cranial arteries and inhibition of pro-inflammatory neuropeptide release.

Uses

Short-term treatment of migraine attacks with or without aura.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

⚠ **ORAL:** Taste disturbance (21% intranasal); dry mouth; dysphagia; throat and neck pain.
CNS: Paresthesia, dizziness, somnolence, vertigo, hyperesthesia (≥2%); headache.
CVS: Hypertensive crisis.
GI: Dyspepsia, nausea (≥2%); ischemic colitis; GI infarction or necrosis.
MISC: Asthenia, pain, chest pain, tightness, or heaviness, warm or cold sensations, sweating (≥ 2%).

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Monitor vital signs (e.g., BP and pulse). Drugs for prevention are sympatholytic; drugs for treatment of acute attack are sympathomimetic.
- Although this drug is used on a short-term basis, chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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zolpidem tartrate (ZOLE-pih-dem TAR-trayt)

Ambien

Drug Class: Sedative and hypnotic
DEA Schedule: Schedule IV

PHARMACOLOGY

Action

Mechanism is unknown but may involve subunit modulation of the gamma-aminobutyrate acid (GABA) receptor chloride channel macromolecular complex.

Uses

Short-term treatment of insomnia.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

Ketoconazole: Possible zolpidem toxicity (decreased metabolism)
- Avoid concurrent use.

ADVERSE EFFECTS

⚠ **ORAL:** Dry mouth.
CNS: Amnesia; daytime drowsiness; dizziness; headache; lethargy; "drugged feelings," lightheadedness; depression; abnormal dreams; ataxia; confusion; euphoria; insomnia; vertigo.
GI: Diarrhea; constipation.
MISC: Allergy; back pain; flu-like symptoms; chest pain.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.
- Avoid prescribing opioids for dental pain.

Oral Health Education

- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

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zonisamide (zoe-NIS-ah-MIDE)

Zonegran

Drug Class: Anticonvulsant, sulfonamide

PHARMACOLOGY

Action

Unknown; however, may produce anticonvulsant effects through action at sodium and calcium channels.

Uses

Adjunctive therapy in the treatment of partial seizures in adult epileptic patients.

DRUG INTERACTIONS RELATED TO DENTAL THERAPEUTICS

No documented drug-drug interactions. The absence of evidence is not evidence of safety.

ADVERSE EFFECTS

Because zonisamide is used as adjunctive therapy, figures obtained when zonisamide is added to concomitant antiepileptic drug therapy cannot be used to predict the frequency of adverse events in the course of usual medical practice. Except for potentially serious adverse effects (e.g., blood dyscrasias, CV events), which have been reported to occur in fewer than 1% of treated patients, the following adverse reactions have been reported in at least 1% of zonisamide-treated patients.

⚠ **ORAL:** Dry mouth; pharyngitis.

CNS: Somnolence; dizziness; headache; agitation; irritability; fatigue; tiredness; difficulty concentrating; memory difficulty; mental slowing; ataxia; paresthesia; confusion; depression; insomnia; anxiety; nervousness; schizophrenic/schizophreniform behavior; speech abnormalities; difficult verbal expression; tremor; convulsion; abnormal gait; hyperesthesia; incoordination.

GI: Nausea; anorexia; vomiting; abdominal pain; diarrhea; dyspepsia; constipation.

RESP: Rhinitis; pulmonary embolus; increased cough.

MISC: Flu-like syndrome; asthenia; accidental injury.

CLINICAL IMPLICATIONS

General

- Determine why drug is being taken. Consider implications of condition on dental treatment.
- Determine level of disease control, type and frequency of seizures, and compliance with medication regimen.
- Determine ability to adapt to stress of dental treatment. Consider short appointments.
- Place on frequent maintenance schedule to avoid periodontal inflammation.
- Chronic dry mouth is possible; anticipate increased caries activity and candidiasis.

Oral Health Education

- Evaluate manual dexterity; consider need for power toothbrush.
- If chronic dry mouth occurs, recommend home fluoride therapy and use of nonalcoholic oral health care products.

Appendices

Appendix A

Drugs Listed by Therapeutic Category or Condition

ALZHEIMER DISEASE

- donepezil (Aricept)
- galantamine (Reminyl)
- memantine (Namenda)
- rivastigmine (Exelon)
- tacrine (Cognex)

ANALGESICS

Nonopioid

- acetaminophen (Tylenol)

NSAIDs

- aspirin
- celecoxib (Celebrex)
- diclofenac (Voltaren)
- diflunisal (Dolobid)
- etodolac
- fenoprofen (Nalfon)
- flurbiprofen (Ansaid)
- ibuprofen (Advil, Motrin, Nuprin)
- indomethacin (Indocin)
- ketoprofen
- ketorolac (Toradol)
- meclofenamate (Meclomen)
- mefenamic acid (Ponstel)
- meloxicam (Mobic)
- nabumetone (Relafen)
- naproxen (Naprosyn, Anaprox)
- oxaprozin (Daypro)
- piroxicam (Feldene)
- sulindac (Clinoril)
- tolmetin (Tolectin)

Opioids

- buprenorphine (Buprenex)
- codeine sulfate
- codeine phosphate/acetaminophen (Tylenol #2, #3, #4)
- fentanyl transdermal (Duragesic)
- fentanyl transmucosal (Actiq)
- hydrocodone/acetaminophen (Lorcet, Vicodin)
- hydrocodone/ibuprofen (Vicoprofen)
- hydromorphone HCl (Dilaudid)
- meperidine (Demerol)
- morphine sulfate (MS Contin)
- oxycodone (OxyContin, Roxicodone)
- oxycodone/ASA (Percodan, Roxiprin)
- oxycodone/acetaminophen (Endocet, Percocet)
- oxycodone/ibuprofen (Combunox)
- pentazocine (Talwin)
- propoxyphene (Darvon)
- propoxyphene/acetaminophen (Darvocet)
- tramadol (Ultram)
- tramadol/acetaminophen (Ultracet)

ANTACID

- magaldrate (Riopan)

H_2 Receptor Antagonists

- cimetidine (Tagamet)
- famotidine (Pepcid)
- nizatidine (Axid)
- ranitidine (Zantac)

ANTIANEMIC/IMMUNE BOOSTER

- darbepoetin alfa (Aranesp)
- epoetin alfa (Procrit)

ANTIANGINALS

Beta-Adrenergic Antagonists

- atenolol (Tenormin)
- metoprolol (Lopressor)

nadolol (Corgard)
propranolol (Inderal)

Calcium Channel Antagonists

amlodipine (Norvasc)
diltiazem (Cardizem, Cartia XT, Dilacor XR)
felodipine (Plendil)
nicardipine (Cardene)
nifedipine (Adalat, Procardia)
nisoldipine (Sular)
verapamil (Calan)

Combination Products

amlodipine/benazepril (Lotrel)
isosorbide dinitrate/hydralazine (BiDil)
losartan/hydrochlorothiazide (Hyzaar)
valsartan/hydrochlorothiazide (Diovan HCT)

Nitrates

isosorbide dinitrate (Isordil)
isosorbide mononitrate (ISMO)
nitroglycerin (Transderm-Nitro)

Others

ranolazine (Ranexa)

ANTIANXIETY/SEDATIVES

Antihistamines

diphenhydramine (Benadryl)
hydroxyzine (Atarax, Vistaril)
promethazine (Phenergan)

Barbiturate

phenobarbital (Luminal)

Benzodiazepines

alprazolam (Xanax)
chlordiazepoxide (Librium)
clorazepate (Tranxene)
diazepam (Valium)
flurazepam (Dalmane)
lorazepam (Ativan)
midazolam
oxazepam (Serax)
temazepam (Restoril)
triazolam (Halcion)

Others

buspirone (BuSpar)
chloral hydrate (Aquachloral)
doxepin (Sinequan)

ANTICOAGULANTS

Coagulation Factor Inhibitor

warfarin sodium (Coumadin)

Low Molecular Weight Heparin

dalteparin sodium (Fragmin)
enoxaparin sodium (Lovenox)

Platelet Inhibitors

aspirin
clopidogrel (Plavix)
dipyridamole (Persantine)
dipyridamole/ASA (Aggrenox)
ticlopidine (Ticlid)

Thrombin Inhibitor

fondaparinux (Arixtra)

ANTICONVULSANTS

acetazolamide (Diamox)
carbamazepine (Tegretol)
clonazepam (Klonopin)
diazepam (Valium)
divalproex (Depakote)
ethosuximide (Zarontin)
felbamate (Felbatol)
gabapentin (Neurontin)
lamotrigine (Lamictal)
levetiracetam (Keppra)
mephobarbital (Mebaral)
oxcarbazepine (Trileptal)
phenobarbital (Luminal)
phenytoin sodium (Dilantin)
pregabalin (Lyrica)
primidone (Mysoline)
tiagabine HCl (Gabitril)
topiramate (Topamax)
valproic acid (Depakene)
zonisamide (Zonegran)

ANTIDEPRESSANTS

Atypical

bupropion HCl (Wellbutrin)

nefazodone HCl (Serzone)
trazodone HCl
venlafaxine HCl (Effexor)

Monoamine Oxidase Inhibitors

phenelzine sulfate (Nardil)
selegiline transdermal (Emsam)
tranylcypromine sulfate (Parnate)

Serotonin-Specific Reuptake Inhibitors

citalopram HCl (Celexa)
escitalopram oxalate (Lexapro)
fluoxetine (Prozac)
fluoxetine/olanzapine (Symbyax)
fluvoxamine maleate (Luvox)
paroxetine (Paxil)
sertraline (Zoloft)

Tetracyclics

mirtazapine (Remeron)

Tricyclics

amitriptyline HCl
clomipramine (Anafranil)
desipramine HCl (Norpramin)
doxepin (Sinequan)
imipramine HCl (Tofranil)
nortriptyline HCl (Pamelor)

ANTIDIABETICS

Alpha Glucosidase Inhibitors

acarbose (Precose)
miglitol (Glyset)

Biguanide

metformin (Glucophage)

Combination Products

glipizide/metformin (Metaglip)
glyburide/metformin (Glucovance)
pioglitazone/metformin (Actoplus Met)
pioglitazone/glimepiride (Duetact)
rosiglitazone/metformin (Avandamet)
rosiglitazone/glimepiride (Avandaryl)
sitagliptin/metformin (Janumet)

Meglitinides

repaglinide (Prandin)

Sulfonylureas

acetohexamide (Dymelor)
chlorpropamide (Diabinese)
glipizide (Glucotrol XL)
glyburide (DiaBeta, Glynase, Micronase)
glimepiride (Amaryl)

Thiazolidinediones

pioglitazone (Actos)
rosiglitazone (Avandia)

Others

exenatide (Byetta)
insulins (see monograph for proprietary brands)
nateglinide (Starlix)
pramlintide (Symlin)
sitagliptin (Januvia)

ANTIEMETICS/VOMITING

aprepitant (Emend)
chlorpromazine (Thorazine)
dimenhydrinate (Dramamine)
meclizine HCl (Bonine)
metoclopramide (Reglan)
odansetron (Zofran)
promethazine (Phenergan)
scopolamine (Transderm-Scop)
trimethobenzamide (Tigan)

ANTIHISTAMINES

azelastine HCl (Astelin, Optivar)
brompheniramine tannate (BroveX)
cetirizine HCl (Zyrtec)
chlorpheniramine maleate (Chlor-Trimeton)
clemastine fumarate (Tavist)
desloratadine (Clarinex)
dimenhydrinate (Dramamine)
diphenhydramine (Benadryl)

fexofenadine HCl (Allegra)
hydroxyzine (Atarax, Vistaril)
ketotifen fumarate (Zaditor)
levocetirizine (Xyzal)
loratadine (Claritin)
meclizine (Bonine)
olopatadine HCl (Patanol)
promethazine (Phenergan)

ANTIHYPERTENSIVES

Alpha-Adrenergic Antagonists

doxazosin mesylate (Cardura)
prazosin HCl (Minipress)
terazosin (Hytrin)

Alpha/Beta Adrenergic Antagonists

carvedilol (Coreg)
labetalol (Normodyne)

Angiotensin-Converting Enzyme Inhibitor

benazepril (Lotensin)
captopril (Capoten)
enalapril maleate (Vasotec)
fosinopril (Monopril)
lisinopril (Prinivil, Zestril)
moexipril HCl (Univasc)
perindopril erbumine (Aceon)
quinapril (Accupril)
ramipril (Altace)
trandolapril (Mavik)

Angiotensin II Receptor Antagonist

candesartan cilexetil (Atacand)
eprosartan (Teveten)
irbesartan (Avapro)
losartan (Cozaar)
olmesartan medoxomil (Benicar)
telmisartan (Micardis)
valsartan (Diovan)

Beta-Adrenergic Antagonist

Cardioselective

atenolol (Tenormin)
betaxolol (Kerlone)
bisoprolol fumarate (Zebeta)
metoprolol tartrate (Lopressor)
nadolol (Corgard)

Noncardioselective

carteolol HCl (Cartrol)
penbutolol (Levatol)
pindolol (Visken)
propranolol HCl (Inderal)
timolol maleate (Blocadren)

Calcium Channel Antagonist

amlodipine besylate (Norvasc)
diltiazem (Cardizem)
felodipine (Plendil)
isradipine (DynaCirc)
nicardipine (Cardene)
nifedipine (Procardia XL)
nisoldipine (Sular)
verapamil (Calan)

Centrally Acting

clonidine (Catapres)
guanabenz acetate (Wytensin)
guanethidine (Ismelin)
guanfacine (Tenex)
methyldopa (Aldomet)

Renin Inhibitor

aliskiren (Tektura)

Combinations

amlodipine/benazepril (Lotrel)
irbesartan/HCTZ (Avalide)
losartan/HCTZ (Hyzaar)
olmesartan/HCTZ (Benicar HCT)

Diuretics (see diuretics)

Other

guanadrel sulfate (Hylorel)
hydralazine (Apresoline)
minoxidil (Rogaine)

ANTI-INFECTIVES

Antifungals

clotrimazole (Mycelex)
fluconazole (Diflucan)
itraconazole (Sporanox)
ketoconazole (Nizoral)
micafungin (Mycamine)

nystatin (Mycostatin, Nilstat)
terbinafine HCl (Lamisil)

ANTIVIRALS

Hepatitis B

adefovir dipivoxil (Hepsera)
entecavir (Baraclude)
interferon alfa 2b (Intron A)
peginterferon alfa-2a (Pegasys)
ribavirin (Copegus)
telbivudine (Tyzeka)

Herpes simplex

acyclovir (Zovirax)
docosanol (Abreva)
penciclovir (Denavir)
valacyclovir (Valtrex)

Herpes zoster

famciclovir (Famvir)
valacyclovir (Valtrex)

Influenza

amantadine (Symmetrel)
oseltamivir (Tamiflu)
rimantadine (Flumadine)
zanamivir (Relenza)

Papillomavirus

kunecatechins (Catechin)

CEPHALOSPORINS

cefaclor (Ceclor)
cefadroxil (Duricef)
cefazolin (Zolicef)
cefdinir (Omnicef)
cefditoren pivoxil (Spectracef)
cefixime
cefpodoxime proxetil (Vantin)
cefprozil monohydrate (Cefzil)
ceftibuten (Cedax)
cefuroxime axetil (Zinacef)
cephalexin (Keflex)
cephradine (Velosef)
loracarbef (Lorabid)

FLUOROQUINOLONES

ciprofloxacin (Cipro)
gatifloxacin (Zymar)
gemifloxacin (Factive)
levofloxacin (Levaquin)
lomefloxacin (Maxaquin)
moxifloxacin (Avelox)
norfloxacin (Noroxin)
ofloxacin (Floxin)

MACROLIDES

azithromycin (Zithromax)
clarithromycin (Biaxin)
erythromycin (Erythrocin, Ery-Tab)

PENICILLINS

amoxicillin (Amoxil)
amoxicillin/clavulanate (Augmentin)
ampicillin (Omnipen)
dicloxacillin sodium (Dynapen)
penicillin V (Veetids, Penicillin VK)

TETRACYCLINES

doxycycline calcium (Vibramycin Syrup)
doxycycline hyclate (Doryx, Monodox)
doxycycline hyclate, topical (Atridox)
doxycycline hyclate, low dose (Periostat)
minocycline HCl (Minocin)
minocycline HCl, topical (Arestin)
tetracycline HCl (Achromycin)
tigecycline (Tygacil)

OTHERS

metronidazole (Flagyl)

ANTISIALAGOGUES (DRY MOUTH)

atropine sulfate (Sal-Tropine)
propantheline bromide (Pro-Banthine)

ANTITUSSIVE (COUGH SUPPRESSANT)

promethazinet dextromethrophan

ARTHRITIS/ANTI-INFLAMMATORY

allopurinol (Zyloprim)
aspirin
auranofin gold (Ridaura)
celecoxib (Celebrex)
diflunisal (Dolobid)
etodolac (Lodine)
fenoprofen (Nalfon)
gold sodium thiomalate (Myochrysine)
ibuprofen (Motrin)
indomethacin (Indocin)
ketoprofen (Orudis)
leflunomide (Arava)
methotrexate (Rheumatrex)
nabumetone
naproxen (Anaprox, Naprosyn)
oxaprozin (Daypro)
piroxicam (Feldene)
probenecid (Benemid)
sulindac (Clinoril)
tolmetin sodium (Tolectin)

ASTHMA/COPD

Bronchodilators

albuterol (Proventil)
albuterol/ipratropium Br (Combivent)
arformoterol (Brovana)
budesonide/formoterol (Symbicort)
epinephrine HCl (Primatene Mist)
ipratropium bromide (Atrovent)
levalbuterol HCl (Xopenex)
metaproterenol (Alupent)
pirbuterol (Maxair)
salmeterol (Serevent)
salmeterol/fluticasone (Advair Diskus)
terbutaline (Brethaire, Bricanyl Turbuhaler)
tiotropium bromide (Spiriva)

Leukotriene Antagonist/Inhibitors

montelukast (Singulair)
zafirlukast (Accolate)
zileuton (Zyflo)

Mast Cell Stabilizers

cromolyn sodium (Intal)
nedocromil sodium (Tilade)

ATTENTION DEFICIT DISORDER

amphetamine/dextroamphetamine (Adderall)
lisdexamfetamine (Vyvanse)

BIPOLAR DISORDER

lithium (Eskalith CR, Lithobid)
valproic acid (Depakene)

CANCER CHEMOTHERAPY

capecitabine (Xeloda)
cetuximab (Erbitux)
fluorouracil (Efudex)
letrozole (Femara)
paclitaxel (Taxol)
methotrexate (Rheumatrex)
tamoxifen (Nolvadex)

CHOLESTEROL REDUCTION

atorvastatin calcium (Lipitor)
cholestyramine (Questran)
colesevelam HCl (WelChol)
colestipol HCl (Colestid)
ezetimibe (Zetia)
fenofibrate (TriCor)
fluvastatin sodium (Lescol)
gemfibrozil (Lopid)
lovastatin (Mevacor)
niacin (Niaspan, Slo-Niacin)
niacin/lovastatin
pravastatin (Pravachol)
rosuvastatin (Crestor)
simvastatin (Zocor)

Combination Products

amlodipine/atorvastatin (Caduet)
simvastin/ezetimibe (Vytorin)

DECONGESTANT/EXPECTORANT

- guaifenesin (Mucinex)
- phenylephrine (Sinex)
- pseudoephedrine (Neo-Synephrine)

DERMATOLOGICS

- acitretin (Soriatane)
- alitretinoin (Panretin)
- capsaicin (Zostrix)
- doxepin (Zonalon)
- isotretinoin (Accutane)
- methotrexate (Folex)
- minoxidil (Rogaine)
- pimecrolimus (Elidel)
- tacrolimus (Protopic)
- tretinoin (Retin-A)

DIURETICS

Loop

- bumetanide (Bumex)
- ethacrynic acid (Edecrin)
- furosemide (Lasix)
- torsemide (Demadex)

Potassium Sparing

- amiloride (Midamor)
- spironolactone (Aldactone)
- triamterene (Dyrenium)

Thiazide/Thiazide-Like

- chlorothiazide (Diuril)
- chlorthalidone (Hygroton)
- hydrochlorothiazide (HydroDIURIL)
- indapamide (Lozol)
- metolazone (Zaroxolyn)

EMPHYSEMA

(see ASTHMA/COPD)

ERECTILE DYSFUNCTION

- sildenafil (Viagra)
- tadalafil (Cialis)
- vardenafil (Levitra)

GERD/PEPTIC ULCER DISEASE

- esomeprazole (Nexium)
- lansoprazole (Prevacid)
- omeprazole (Prilosec)
- omeprazole/bicarbonate (Zegerid)
- pantoprazole (Protonix)
- rabeprazole (AcipHex)

GLAUCOMA

- betaxolol (Betoptic)
- carteolol (Ocupress)
- latanoprost (Xalatan)
- pilocarpine (Isopto Carpine)
- timolol maleate (Timoptic)

GLUCOCORTICOIDS/ANTI-INFLAMMATORIES

Inhalants

- beclomethasone (Vanceril)
- budesonide (Rhinocort)
- flunisolide (AeroBid)
- fluticasone (Flonase)
- mometasone (Nasonex)
- triamcinolone (Azmacort)

Systemic

- betamethasone (Celestone)
- cortisone acetate (Cortone)
- dexamethasone (Decadron)
- fludrocortisone
- hydrocortisone (Cortef)
- methylprednisolone (Medrol)
- prednisolone (Delta-Cortef)
- prednisone (Deltasone, Meticorten)
- triamcinolone (Aristocort)

Topicals

- betamethasone (Diprolene)
- clobetasol propionate (Olux, Temovate)
- clocortolone pivalate (Cloderm)
- desonide (DesOwen)
- desoximetasone (Topicort)
- dexamethasone (Decaderm)

- ℞diflorasone diacetate (Florone)
- ℞fluocinonide (Lidex)
- flurandrenolide (Cordran)
- fluticasone propionate (Cutivate)
- halcinonide (Halog)
- halobetasol (Ultravate)
- hydrocortisone (Alacort)
- ℞triamcinolone (Kenalog, Kenalog with Orabase)

GOUT

- probenecid (Benemid)

HEMOSTATICS

- ℞absorbable gelatin sponge (Gelfoam)
- ℞aminocaproic acid (Amicar)
- ℞oxidized cellulose (Surgicel)
- ℞tranexamic acid (Cyklokapron)

HIV DISEASE

Nonnucleoside Analogs

- delavirdine mesylate (Rescriptor)
- efavirenz (Sustiva)
- nevirapine (Viramune)
- tenofovir (Viread)

Nucleoside Analogs

- abacavir sulfate (Ziagen)
- emtricitabine (Emtriva)
- lamivudine (3TC, Epivir)
- stavudine (d4T, Zerit)
- zalcitabine (Hivid)
- zidovudine (AZT, Retrovir)

Protease Inhibitors

- atazanavir (Reyataz)
- darunivar (Prezista)
- indinavir (Crixivan)
- lopinavir/ritonavir (Kaletra)
- nelfinavir (Viracept)
- ritonavir (Norvir)
- saquinavir (Invirase, Fortovase)
- tipranavir (Aptivus)

Combination Products

- abacavir, lamivudine, zidovudine (Trizivir)
- abacavir/lamivudine (Epzicom)
- lamivudine/zidovudine (Combivir)

Other

- enfuvirtide (Fuzeon)
- maraviroc (Selzentry)

INCONTINENCE/ ANTICHOLINERGICS

- oxybutynin Cl (Ditropan XL)
- tolterodine (Detrol)

IRRITABLE BOWEL SYNDROME

- alosetron (Lotronex)
- lubiprostone (Amitiza)

MANIA/ANTIPSYCHOTICS

Phenothiazines

- chlorpromazine (Thorazine)
- fluphenazine
- perphenazine (Trilafon)
- prochlorperazine (Compazine)
- thioridazine
- trifluoperazine (Stelazine)

Others

- aripiprazole (Abilify)
- clozapine (Clozaril)
- haloperidol (Haldol)
- olanzapine (Zyprexa)
- paliperidone (Invega)
- quetiapine (Seroquel)
- risperidone (Risperdal)
- thiothixene (Navane)
- ziprasidone (Geodon)

MIGRAINE HEADACHE

- almotriptan (Axert)
- divalproex (Depakote)
- eletriptan HBr (Replax)
- frovatriptan (Frova)
- propranolol (Inderal)
- rizatriptan (Maxalt)
- sumatriptan (Imitrex)

timolol (Blocadren)
zolmitriptan (Zomig)

NEURALGIA/NEUROPATHY

pregabalin (Lyrica)

ORGAN TRANSPLANT

cyclosporine (Neoral)
muromonab (Orthoclone OKT)
mycophenolate (CellCept)
sirolimus (Rapamune)
tacrolimus (Prograf)

OSTEOPOROSIS

alendronate sodium (Fosamax)
calcitonin-salmon (Calcimar)
etidronate (Didronel)
ibandronate (Boniva)
raloxifene (Evista)
risedronate sodium (Actonel)
teriparatide acetate (Forteo)
zoledronic acid (Zometa, Reclast)

PARKINSON DISEASE/ ANTICHOLINERGICS

amantadine (Symmetrel)
benztropine (Cogentin)
biperiden HCl (Akineton)
bromocriptine mesylate (Parlodel)
entacapone (Comtan)
levodopa/carbidopa (Sinemet)
pramipexole dihydrochloride (Mirapex)
rasagiline (Azilect)
ropinirole HCl (Requip)
rotigotine (Neupro)
selegiline HCl (Eldepryl)
tolcapone (Tasmar)

PROSTATE DISORDER

dutasteride (Avodart)

SKELETAL MUSCLE RELAXANT

carisoprodol (Soma)
cyclobenzaprine (Flexeril)
dantrolene (Dantrium)
methocarbamol (Robaxin)

SLEEP DISORDER

armodafinil (Nuvigil)
eszopiclone (Lunesta)
ramelteon (Rozerem)
zaleplon (Sonata)
zolpidem (Ambien)

SMOKING CESSATION

bupropion (Zyban)
nicotine polacrilex (Nicorette)
nicotine transdermal (Habitrol, ProStep)
varenicline (Chantrix)

SUBSTANCE ABUSE

buprenorphine (Buprenex)
buprenorphine/naloxone (Suboxone)
disulfiram (Antabuse)
flumazenil (Romazicon)
naloxone
nalmefene (Revex)
naltrexone (ReVia, Trexan)

THYROID DISEASE

Hyperthyroidism

methimazole (Tapazole)
propylthiouracil (PTU)

Hypothyroidism

levothyroxine (Synthroid)
liothyronine (Cytomel)
liotrix (Euthyroid)
thyroid (Armour Thyroid)

TUBERCULOSIS

aminosalicylic acid (Paser)
cycloserine (Seromycin)
ethambutol (Myambutol)
ethionamide (Trecator)
isoniazid (INH, Nydrazid)
pyrazinamide (generic only)
pyrazinamide/rifampin, INH (Rifater)

rifabutin (Mycobutin)
rifampin (Rifadin)
rifampin/isoniazid (Rifamate)
rifapentine (Priftin)

XEROSTOMIA/ CHOLINERGICS

- cevimeline (Evoxac)
- pilocarpine HCl (Salagen)

Appendix B

Abbreviations

A1C, Hg A1C	glycosylated hemoglobin lab test
ACE	angiotensin-converting enzyme
ADA	American Dental Association
ADHD	attention deficit hyperactivity disorder
apo B	apolipoprotein B
ASA	acetylsalicylic acid (aspirin)
AUC	area under the curve
AV	atriovenous
b.i.d., bid	twice a day [L. *bis in die*]
BP	blood pressure
BPH	benign prostate hypertrophy
BT	bleeding time
BUN	blood urea nitrogen
CAD	coronary artery disease
C_{cr}, Ccr	creatinine clearance
CHF	congestive heart failure
Cl_R	renal clearance
C_{max}	maximal drug concentration
CNS	central nervous system
COPD	chronic obstructive pulmonary disease
COX	cyclooxygenase
CV	cardiovascular
CVD	cardiovascular disease
DIC	disseminated intravascular coagulation
DDS	doctor of dental surgery
DM	diabetes mellitus

Abbreviations

DNA	deoxyribonucleic acid
DVT	deep vein thrombosis
GABA	gamma aminobutyric acid
GERD	gastroesophageal reflux disease
GI	gastrointestinal
GU	genitourinary
H_1	histamine 1 receptor
HBr	hydrobromide
HCl	hydrochloride
HDL	high-density lipoprotein
HIV	human immunodeficiency virus
HMG-CoA	3-hydroxy-3-methylglutaryl-coenzyme A reductase
hr	hour
5-HT	5-hydroxytryptamine
IL	interleukin
IM	intramuscular
INR	international normalized ratio
INX	interaction
IV	intravenous
JRA	juvenile rheumatoid arthritis
LDL	low-density lipoprotein
LFT	liver function test
MAO	monoamine oxidase
MD	medical doctor
MI	myocardial infarction
min	minute

Abbreviations

MISC	miscellaneous
mo	month
MTX	methotrexate
NSAID	nonsteroidal anti-inflammatory drug
OCD	obsessive-compulsive disorder
OTC	over the counter
PAF	paroxysmal atrial fibrillation
PE	pulmonary embolism
PMDD	premenstrual dysphoric disorder
PMN	polymorphonuclear leukocytes
p.o., PO	by mouth, orally [L. *per os*]
p.r., PR	by way of rectum [L. *per rectum*]
p.r.n., prn	as needed [L. *pro re nata*]
PSVT	paroxysmal supraventricular tachycardia
PT	prothrombin time
PTSD	posttraumatic stress disorder
PUD	peptic ulcer disease
PX	prevention
q.6h., q6h	every six hours
q.i.d., qid	four times a day [L. *quater in die*]
RCT	randomized controlled trial
RNA	ribonucleic acid
RSV	respiratory syncytial virus
SC	subcutaneous
SL	sublingual
SR	sustained release
SSRI	selective serotonin reuptake inhibitor

Abbreviations

$t_{1/2}$	elimination half life
t.i.d., tid	three times a day [L. *ter in die*]
TJR	total joint replacement
T_{max}	time to maximum blood level
TMJ	temporomandibular joint
TNF	tumor necrosis factor
TX	treatment
URI	upper respiratory tract infection
UTI	urinary tract infection
Vd	volume of distribution
VLDL	very low density lipoprotein
VT	ventricular tachycardia
WBC	white blood cell
wk	week
XR	extended release
yr	year

Appendix C

Herbal and Nutritional Supplements of Interest to Dentistry

The information in this section addresses only the clinical implications relevant to oral health care when clients are taking a supplement. The common supplement name is followed in brackets by other names used.

When conducting a review of the patient's health history, ask the following questions:

- Do you take any supplements or herbal products?
- What do you take?
- How much do you take and how often do you take it?
- Why are you taking this/these product(s)?
- Did you take any today?

Herbs with theoretical antiplatelet/anticoagulant potential because they contain coumarin, salicylate, or other antiplatelet constituents: angelica, anise, arnica, asafoetida, bilberry, bogbean, boldo, capsicum, celery, chamomile, clove, cranberry, cucurbita, danshen, dong quai, fenugreek, feverfew, garlic, ginger, ginkgo biloba, (Siberian) ginseng, (Panax) ginseng, green tea, horse chestnut, horseradish, kava kava, licorice, *Lycium barbarum*, mango, meadowsweet, prickly ash, onion, papain, passion flower, poplar, pycnogenol, quassia, quilinggao, quinine, red clover, saw palmetto, soy bean, tumeric, vitamin E-containing herbs (sunflower seeds), wild carrot, wild lettuce, and willow.[C-1]

Herbs with theoretical additive sedation effects: calamus, calendula, California poppy, catnip, capsicum, celery, elecampane, (Siberian) ginseng, German chamomile, goldenseal, gotu kola, hops, Jamaican dogwood, kava kava, lemon balm, sage, St. John's wort, sassafras, skullcap, shepherd's purse, stinging nettle, valerian, wild carrot, wild lettuce, withania root, and yerba mansa.[C-1]

The American Society of Anesthesiology recommends all herbal product usage be discontinued 2–3 weeks prior to any surgical procedures to avoid any potential catastrophic event. However, it is unknown to what extent this reduces untoward effects.

Herb or Supplement	Implications for Dentistry
alfalfa	• May contain high levels of alcohol; vomiting may occur if metronidazole is prescribed

[C-1] Excerpted from Natural Medicines Comprehensive Database. www.naturaldatabase.com

Herb or Supplement	Implications for Dentistry
aloe vera [burn plant, curacao aloe, Zanzibar aloe]	• Topical application of gel; oral liquid or juice is used to prevent periodontal disease; no randomized controlled trial evidence for support • Swallowing liquid aloe vera may inhibit absorption of oral drugs; allow 2 hr between doses • Overuse and subsequent K^+ loss may increase risks/side effects with corticosteroids • Hypoglycemic side effects: monitor client with diabetes
astragalus [milk vetch, huang chi]	• This herb has the potential to lower blood pressure; patient should be monitored for orthostatic hypotension • Monitor blood pressure in elderly, those with CVD, or clients fasting in preparation for surgery • May reduce effects of corticosteroids • Additive effects with benzodiazepines, CNS depressants, barbiturates, and opioids; monitor for orthostatic hypotension
bilberry fruit [blueberry, huckleberry, hurtleberry]	• Used as an astringent to relieve oral inflammation • At high doses, platelet aggregation may be inhibited, resulting in increased bleeding • Avoid use of NSAIDs for orodental pain
bistort [adderwort, dragonwort, snakeweed]	• Has been used as a mouthwash to treat periodontal disease, aphthous ulcers, and mouth ulcerations • Herb has no influence on dental treatment
black cohosh [black snakeroot, baneberry, squaw root, rattleroot]	• High doses can lead to hypotension, bradycardia, and gastric distress; monitor vital signs and use semisupine chair position • Contains salicylic acid; risk for toxicity when other salicylates are used • Additive hepatotoxicity, interference with clotting: avoid use with acetaminophen, NSAIDs, macrolide antibiotics, azole antifungals, and dapsone • Hypotensive effects may be enhanced if used with anesthetics or sedatives

Herb or Supplement	Implications for Dentistry
Boswellia [frankincense]	• In vitro studies have shown antiinflammatory effects • Herb has no influence on dental treatment; no drug interactions reported
bromelain [bromelin, pineapple]	• Used for acute postoperative or posttrauma conditions of swelling, inhibition of blood platelet aggregation, and enhanced antibiotic absorption • Contains enzyme that may release kinin to stimulate prostaglandin E_1-like compounds • Adverse effects: GI disturbances, diarrhea • Has potential to increase bleeding time with NSAIDs, aspirin • Tetracyclines: increased plasma and urine levels of tetracyclines
butterbur [*Petasites*, blatterdock, butterfly dork]	• May have antiinflammatory, antispasmodic effects on smooth muscle; randomized controlled trials support use as antimigraine agent • Drug interaction: CYP_3A_4 inhibitors (erythromycin, azole antifungals) may increase hepatotoxicity of butterbur • Eugenol: May increase pyrrolizidine alkaloid toxicity
Calendula [marigold, holligold, marybud]	• Topical use to treat inflammation of oral mucosa, increase healing through anti-inflammatory and granulatory actions • Theoretical enhanced sedation and adverse effects with sedatives, drugs having CNS depressant properties
Capsicum [cayenne pepper, capsaicin, chili pepper]	• Used for toothache, pharyngitis, reducing muscle cramps, and joint pain • Topical OTC agent [Zostrix, others]; no drug interactions reported • **Oral use:** Platelet aggregation may be inhibited resulting in increased bleeding • Additive sedative and side effects with barbiturates and sedatives

Herb or Supplement	Implications for Dentistry
cat's claw [Una de Gato, Vine of Peru, Samento]	• Platelet aggregation may be inhibited resulting in increased bleeding • Avoid recommending aspirin, NSAIDs; additive bleeding effect • Advise to stop herb 2 wk before surgery • Adverse effects: diarrhea, hypotension, bleeding gums, bruising • Herb has potential to lower blood pressure; monitor for orthostatic hypotension • Theoretically may interfere with corticosteroid activity
chamomile [German chamomile]	• Used as mouthwash for aphthous ulcers, anti-inflammatory • Contains volatile oil and umbelliferone (coumarin-like ingredient) that may cause increased bleeding • **Oral use:** Enhanced sedation and adverse effects theoretically possible with CNS depressants, sedatives • Avoid recommending aspirin, NSAIDs; additive bleeding effect • Advise to stop herb 2 wk before surgery
chasteberry [chaste tree, hemp tree, monk's pepper]	• Adverse effects: dry mouth, tachycardia • Monitor pulse before treatment • If chronic dry mouth results, recommend home fluoride products for cariostatic effects • No dental drug interactions reported
chondroitin sulfate	• Used alone or in conjunction with glucosamine to relieve symptoms of osteoarthritis • Determine whether TMJ or fingers/wrist are affected and relation to oral hygiene effectiveness or ability to hold mouth open for dental treatment • Associated with increased bleeding; avoid aspirin • No dental drug interactions reported, but be aware client may also be using salicylates (antiplatelet affect)

Herb or Supplement	Implications for Dentistry
clove [lavanga, caryophylli]	• Oil of cloves contains eugenol, used to relieve toothache and dry socket; component of temporary filling dental material; used as mouthwash and to relieve mouth and throat inflammation • Self-application of oil may result in gingival irritation and facial anesthesia • Platelet aggregation may be inhibited resulting in increased bleeding • Avoid recommending aspirin, NSAIDs; additive bleeding effect
coenzyme Q-10 [CoQ-10]	• Used to boost immune system; topically to treat periodontal disease; CHF, CVD, DM, and other reasons • Ask why supplement is used, consider effect of disease on dental treatment • Likely ineffective for periodontal treatment • No dental drug interactions reported; structurally similar to vitamin K, can interfere with warfarin
coleus forskohlii [forskolin, colforsin, borforsin]	• Additive effects with benzodiazepines, CNS depressants, barbiturates, opioids: herb has potential to lower blood pressure, monitor for orthostatic hypotension • Platelet aggregation may be inhibited resulting in increased bleeding • Avoid recommending aspirin, NSAIDs; additive bleeding effect
cordyceps	• Platelet aggregation may be inhibited resulting in increased bleeding • Avoid recommending aspirin, NSAIDs; additive bleeding effect • May decrease immunosuppressant effects of prednisone
cranberry [vaccinium vitis-ideae]	• Reports of increased INR and bleeding problems • Cranberry juice in large amounts can reduce urinary pH, theoretically causing increased excretion of opiates, antidepressants, some antibiotics

Herb or Supplement	Implications for Dentistry
creatine	• Used in neuromuscular disorders to increase muscle mass • No dental drug interactions reported
devil's claw [grapple plant, wood spider]	• Used topically as ointment for injuries; oral use: variety of uses • May cause loss of taste (8%) • **Oral use:** Claims of hypotensive effect; monitor blood pressure in elderly, those with CVD • May decrease blood glucose; monitor client with diabetes • Theoretically, because of increase in stomach acids, could enhance absorption of penicillin and doxycycline • Platelet aggregation may be inhibited resulting in increased bleeding • Avoid recommending aspirin, NSAIDs; additive bleeding effect
Dong quai [*Angelica sinensis*]	• Used in Chinese medicine for gynecological complaints • Additive effects with benzodiazepines, CNS depressants, barbiturates, opioids: herb has potential to lower blood pressure; monitor for orthostatic hypotension • Platelet aggregation may be inhibited resulting in increased bleeding • Avoid recommending aspirin, NSAIDs; additive bleeding effect • Tetracycline: photosensitization reactions possible • Enhanced sedation and hypotension theoretically possible with CNS depressants, sedatives

Herb or Supplement	Implications for Dentistry
Echinacea purpurea [purple coneflower, Kansas snakeroot]	• Used topically to treat mouth and pharyngeal inflammation • Daily use may depress immunity; anecdotal reports of oral candidiasis when used for more than 8 weeks • May interfere with corticosteroid action • Additive hepatotoxicity: avoid use with acetaminophen, NSAIDs, macrolide antibiotics, azole antifungals, and dapsone • Phenobarbital and other microsomal enzyme inducers may decrease the effects of echinacea • Discontinue echinacea use 2 wk before surgery
Eleutherococcus [Siberian ginseng, devil's shrub, wild pepper, touch-me-not]	• Often contains ginsenosides with opposing effects: may cause either an increase or decrease in blood pressure or CNS stimulation or depression • Adverse effects: hypertension, tachycardia • Monitor blood pressure and pulse before dental treatment • Platelet aggregation may be inhibited, resulting in increased bleeding • Avoid recommending aspirin, NSAIDs; additive bleeding effect • Enhanced sedation and adverse effects theoretically possible with CNS depressants, sedatives • Use epinephrine with caution, in low doses • Siberian ginseng is different than Panax ginseng (American)
ephedra [ma huang]	• Sympathomimetic action: cardiovascular stimulation may cause fatal arrhythmia, myocardial infarction, stroke, hypertensive crisis • Action may be potentiated with propoxyphene • Use epinephrine with caution, low doses • Sale currently banned in United States (does not apply to topical use) • Stop use 2 weeks prior to surgical procedures

Herb or Supplement	Implications for Dentistry
essential oils	• Eugenol, thymol, carvacrol, menthol, eucalyptol, and oil of cloves are examples • Listerine contains menthol, thymol, eucalyptol, and methyl salicylate with alcohol • Antibacterial effect of combination product led to ADA approval as antigingivitis mouthrinse (not to be swallowed)
evening primrose [feverplant, night willow herb, scabish]	• Weak evidence supports use for periodontitis because of anti-inflammatory effects • Platelet aggregation may be inhibited resulting in increased bleeding • Avoid recommending aspirin, NSAIDs; theoretical additive bleeding effect • Monitor blood pressure because of potential hypotensive effect
feverfew [featherfew, midsummer daisy, *Tanacetum parthenium*]	• Primary use: migraine prophylaxis; used after tooth extraction as a mouthwash for anti-inflammatory and antiseptic properties • Chewing fresh leaves may cause mouth ulceration, loss of taste, and glossitis • Platelet aggregation may be inhibited resulting in increased bleeding • Avoid recommending aspirin, NSAIDs; additive bleeding effect—NSAIDs can theoretically decrease the effectiveness of feverfew

Herb or Supplement	Implications for Dentistry
garlic [*Allium sativum*, stinking rose]	• Determine why client is taking herb; often used to treat symptoms of CVD; consider effects of condition on dental treatment • Additive effects with benzodiazepines, CNS depressants, barbiturates, opioids: herb has potential to lower blood pressure; monitor for orthostatic hypotension • Monitor vital signs from cardiovascular effects • Platelet aggregation may be inhibited resulting in increased bleeding, stop use 10–14 days before surgical procedures • Avoid recommending aspirin, NSAIDs; additive bleeding effect • Interacts with drugs metabolized by P450 3A4 isoenzyme • Fresh garlic: Increased effects of triazolam because of inhibition of first-pass effect • Risk of hypoglycemia in client taking insulin or sulfonylureas
ginger [*Zingiber* rhizoma]	• Fresh ginger may be taken to reduce toothache • Additive effects with benzodiazepines, CNS depressants, barbiturates, opioids: herb has potential to lower blood pressure; monitor for orthostatic hypotension • Monitor vital signs from cardiovascular effects (arrhythmia) • Platelet aggregation may be inhibited resulting in increased bleeding • Avoid recommending aspirin, NSAIDs; additive bleeding effect • Risk of hypoglycemia in client taking insulin • May enhance barbiturate action • Additive effects with benzodiazepines, CNS depressants, barbiturates, opiods: herb has potential to lower blood pressure; monitor for orthostatic hypotension

Herb or Supplement	Implications for Dentistry
ginkgo biloba [maidenhair tree, kew tree]	• Determine why client is taking herb; often used to treat symptoms of CVD; consider effects of condition on dental treatment • Platelet aggregation may be inhibited resulting in increased bleeding • Advise to stop herb 2 wk before surgery • Possible interaction with aspirin, NSAIDs; additive bleeding effect • Inhibits cytochrome P450 3A4: other potential interactions
ginseng, Panax [Asian, Chinese, Japanese or Korean ginseng, red ginseng, tartar root]	• Monitor vital signs due to cardiovascular effects (arrhythmia) • Additive effects with benzodiazepines, CNS depressants, barbiturates, opioids: herb has potential to lower blood pressure; monitor for orthostatic hypotension • Platelet aggregation may be inhibited resulting in increased bleeding • Avoid recommending aspirin, NSAIDs; additive bleeding effect • Advise to stop herb 2 wk before surgery • Risk of hypoglycemia in client taking insulin
glucosamine sulfate	• Used for joint dysfunction, osteoarthritis: question about use of aspirin, NSAIDs • No dental drug interactions reported
goldenseal [yellow root, *Hydrastis canadensis*]	• Used as mouthrinse to relieve gingival pain and herpes labialis • High doses lead to cardiac toxicity, arrhythmia: monitor blood pressure, pulse • Enhanced sedation and adverse effects theoretically possible with CNS depressants, sedatives • Additive photosensitization with tetracyclines • Inhibits cytochrome P450 3A4: other potential interactions

Herb or Supplement	Implications for Dentistry
gotu kola [Centella, Indian pennywort]	• Used in oral rinse for anti-inflammatory effect, wound healing • High doses have hypertensive effect: monitor blood pressure • **Oral use:** Enhanced sedation and adverse effects theoretically possible with CNS depressants, sedatives
grape seed [*Vitis vinifera*]	• Determine why client is taking herb; often used to treat symptoms of CVD; consider effects of condition on dental treatment • No dental drug interactions reported
green tea	• Tea bags can be used after tooth extraction for hemostasis • Caffeine component can decrease effectiveness of aspirin, APAP; also implicated in many drug interactions causing increased CNS stimulation and increased heart rate • Theoretically can reduce effects of benzodiazepines • Reduced metabolism of herb and increased CNS effects possible with fluconazole, CNS depressants
guar gum	• Decreased absorption of penicillin, aspirin; take 1 hr before or several hours after guar gum
guggul	• Used in Ayurvedic medicine for arthritis; in mouthrinse for anti-inflammatory effect and to promote healing • Question client about concurrent use of aspirin, NSAIDs • Platelet aggregation may be inhibited resulting in increased bleeding • May decrease absorption of many other drugs
hawthorn	• Determine why client is taking herb; often used to treat symptoms of CVD, hypertension; consider effects of condition on dental treatment • Monitor vital signs because of cardiovascular effects • Additive effects with benzodiazepines, CNS depressants, barbiturates, opioids: herb has potential to lower blood pressure; monitor for orthostatic hypotension

Herb or Supplement	Implications for Dentistry
horse chestnut [buckeye]	• Platelet aggregation may be inhibited, resulting in increased bleeding • Avoid recommending aspirin, NSAIDs; additive bleeding effect • Advise to stop herb 2 wk before surgery • Theoretically, the saponin constituent of horse chestnut seed or extract might interfere with protein binding of oral drugs
kava [kava kava, intoxicating pepper, kew]	• Chewing kava can cause intraoral numbness • Kava has analgesic properties not reversed by naloxone • Potential for platelet inhibition effect • Advise to stop herb 2 wk before surgery • Enhanced sedation and adverse effects theoretically possible with CNS depressants, sedatives • Additive hepatotoxicity: avoid use with acetaminophen, NSAIDs, macrolide antibiotics, azole antifungals, and dapsone • Long-term use may produce tolerance to benzodiazepines
lavender	• May enhance sedative and hypnotic drugs (benzodiazepines) • May increase bleeding
lemon balm [honey plant, *Melissa*, dropsy plant]	• Topical use to reduce symptoms for herpes labialis • **Oral use:** Enhanced sedation and adverse effects theoretically possible with CNS depressants, sedatives • Theoretically, taking lemon balm with barbiturates can produce additive effects

Herb or Supplement	Implications for Dentistry
licorice [*Glycyrrhiza*, sweet root]	• Ask why client is using herb: used for upper respiratory tract infections; monitor for infectious potential and disease transmission during dental treatment • Licorice candy does not contain the herb; it is flavored with anise • Overuse of licorice can produce cardiovascular toxicity, hypokalemia, increased blood pressure; monitor vital signs • Platelet aggregation may be inhibited resulting in increased bleeding • Avoid recommending aspirin, NSAIDs; additive bleeding effect. NSAIDS may also increase water retention • Increased activity of corticosteroids (oral and topical)
lysine [L-Lysine, Lys]	• Used to reduce symptoms and healing time of herpes labialis • **Oral use:** 1,000 mg daily for 12 months and 1,000 mg three times a day for 6 months reported in clinical trials • No dental drug interactions reported
melatonin [pineal hormone, MLT]	• Melatonin can interfere with immunosuppressant drug action • Enhanced sedation and adverse effects theoretically possible with CNS depressants, sedatives
myrrh [*Commiphora molmol*]	• Resin used topically to reduce oral and pharyngeal inflammation, aphthous ulcers pain, and gingivitis • No dental drug interactions reported
nettle root [stinging nettle]	• Used to reduce symptoms of inflammation, osteoarthritis: may be taking aspirin, NSAIDs • Adverse effects: hypotension: monitor for orthostatic hypotension • Additive CNS depressant effects with CNS depressants

Herb or Supplement	Implications for Dentistry
parsley	• Fresh parsley is chewed as a breath freshener • Herb has potential to lower blood pressure; monitor for orthostatic hypotension • No dental drug interactions reported
passion flower [maypop, passion vine]	• Platelet aggregation may be inhibited, resulting in increased bleeding • Avoid recommending aspirin, NSAIDs; additive bleeding effect • Enhanced sedation and adverse effects theoretically possible with CNS depressants, sedatives
peppermint oil	• Ask why client is using herb: used as inhalant to relieve upper respiratory tract congestion; determine risk for infectiousness • Primary constituent of the oil is menthol
prickly ash [prickly yellowwood, toothache tree]	• Has been used to relieve toothache, ulcerations • Platelet aggregation may be inhibited, resulting in increased bleeding • Avoid recommending aspirin, NSAIDs; additive bleeding effect
probiotics [acidophilus]	• Product contains microorganisms to colonize GI flora while taking antibiotics • Determine why supplement is being taken; determine risk for infectiousness or relationship to dental treatment • Use of probiotics ½ hr before or 3 hr after taking antibiotics may prevent antibiotic-associated diarrhea
pycnogenol	• Product claims to inhibit blood clotting, treat mild hypertension, reduce gingival bleeding and plaque, many other claims • Discontinue use 1 wk prior to surgery or anesthesia procedures • Not much known about drug interactions; drugs metabolized in P450 system may have altered metabolism

Herb or Supplement	Implications for Dentistry
quercetin [meletin, sophretin]	• Determine why client is taking herb; often used to treat symptoms of CVD; consider effects of condition on dental treatment • Monitor vital signs because of potential cardiovascular effects • No dental drug interactions reported; may oppose effects of quinolone antibiotics
red clover [cow clover, beebread]	• Used to relieve symptoms of upper respiratory tract infection; determine risk for infectiousness during dental treatment • Coumarin constituents in red clover can result in increased bleeding • Avoid recommending aspirin, NSAIDs; additive bleeding effect
red yeast rice [monascus, ZhiTai]	• Determine why client is taking herb; often used to treat symptoms of CVD; consider effects of condition on dental treatment • Product contains lovastatin to block production of cholesterol in the liver • Additive hepatotoxicity: avoid use with acetaminophen, NSAIDs, macrolide antibiotics, azole antifungals, and dapsone • Azole antifungals, erythromycin: inhibits metabolism of red yeast rice; potential for toxicity
rhatany [Krameria, mapato]	• Used topically for inflamed oral and pharyngeal mucosa, gingivitis, glossitis, stomatitis, and canker sores • No dental drug interactions reported
sage [*Salvia officinalis*]	• Used topically as a gargle for pharyngitis, stomatitis, gingivitis, or for oral injury • Sage and rhubarb mixed in cream used for herpes labialis • Additive effects with benzodiazepines, CNS depressants, barbiturates, opioids: herb has potential to lower blood pressure; monitor for orthostatic hypotension • Adverse effects: cheilitis, stomatitis, dry mouth • Enhanced sedation and adverse effects theoretically possible with CNS depressants, sedatives

Herb or Supplement	Implications for Dentistry
SAMe [s-adenosylmethionine]	• Determine why client is taking supplement; consider relevance to dental treatment • Platelet aggregation may be inhibited resulting in increased bleeding • Avoid recommending aspirin, NSAIDs; additive bleeding effect • Theoretical concern that use with meperidine or tramadol may cause serotonin syndrome
saw palmetto [Serenoa repens]	• Adverse effects: GI complaints, nausea; determine whether semisupine chair position is desired • May enhance bleeding if aspirin, NSAIDS are taken
St. John's wort [*Hypericum perforatum*]	• Determine why client is taking herb; consider relationship to ability to handle stress of dental treatment and motivation for self-care • Advise to stop herb 2 wk before surgery • Enhanced sedation and adverse effects theoretically possible with CNS depressants, sedatives • Adverse effects: GI complaints, photosensitivity • Interactions are possible with a variety of drugs (ibuprofen, clindamycin, erythromycin, diazepam, barbiturates), often leading to reduced drug action; potent CYP3A4 inducer • Increased risk for serotonin syndrome if used with tramadol or meperidine • Tetracyclines: increased potential for photosensitivity: advise to wear sunscreen if exposed to sunlight
stevia [sweetleaf, Yerba dulce]	• Cariostatic sweetener used in dental gels, mouthrinses • High doses can have hypotensive effect; monitor blood pressure • No dental drug interactions reported
tryptophans [L-tryptophan]	• Theoretical concern about serotonin syndrome with meperidine, tramadol • May cause dry mouth • Additive sedation with CNS depressants

Herb or Supplement	Implications for Dentistry
turmeric [Curcuma, Indian saffron]	• Used for symptoms of dyspepsia, bloating: may need to use a semisupine chair position • Herb has potential to lower blood pressure; monitor for orthostatic hypotension • Platelet aggregation may be inhibited resulting in increased bleeding • Avoid recommending aspirin, NSAIDs; additive bleeding effect
valerian [All heal; garden heliotrope, amantilla]	• Determine why client is using herb: used to promote sleep, relieve anxiety: determine relationship to ability to handle stress of dental treatment • Enhanced sedation and adverse effects theoretically possible with CNS depressants, sedatives • Avoid taking 2 weeks before surgery • May inhibit CYP3A4 isoenzymes, lead to increased blood levels
vitamin E	• Doses greater than 400 IU/day may inhibit platelet aggregation, antagonize liver clotting factors, delay wound healing, increase bleeding
xylitol	• A cariostatic sweetener from birch tree bark in toothpaste, gum, or gels • No dental drug interactions reported
yohimbe	• Large doses: herb has potential to lower blood pressure; monitor for orthostatic hypotension • Adverse effects: salivation, tachycardia, hypertension • Monitor vital signs for cardiovascular effects • Use indirect-acting sympathomimetics with caution, in low doses, with aspirating syringe

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Appendix D

English/Spanish Dental Communication
Inglés/Español — Comunicación dental

From *Vamos al Dentista*, UTHSC, San Antonio, TX[D-1]

Basic Dental Terms	Términos dentales básicos
dental chair	la silla dental
dental floss	el hilo dental
dental office	consultorio dental
dentist	el dentista (male)/la dentista (female)
dentists	los dentistas
cavity	caries
a filling	un empaste un relleno
several fillings	unos empastes unos rellenos
tooth	diente
baby tooth	diente de leche
broken tooth	diente partido
gum (gingiva)	encía
abscess	absceso
the suture	la sutura
injection	inyección
toothbrush	el cepillo dental
toothpaste	la pasta de dientes
tongue	la lengua
lips	los labios
TMJ	la ATM articulación mandíbulo-temporal
Thank you.	gracias
You're welcome.	de nada

[D-1] Adapted with permission from Glass BJ, Partida N, Rodriguez I, Arredondo DG. *Vamos al Dentista (Let's go to the Dentist): English to Spanish Translations of Commonly Used Terms and Phrases in the Dental Office*. UTHSCSA Dental School; 1999. To order the full booklet, please contact Becky Nixon, UTHSCSA Dental School, Office of Continuing Education, at (210) 567-3177 or by e-mail to Nixon@uthscsa.edu.

Basic Dental Phrases	Frases dentales básicas
I am the dentist.	Yo soy el (male)/la (female) dentista.
What is your problem?	¿Cuál es su problema?
How old are you?	¿Cuántos años tienes?
How are you?	¿Cómo está usted?
How long have you had the problem?	¿Por cuánto tiempo ha tenido este problema?
Did you brush your teeth?	¿Se cepilló los dientes?
I have to extract the molar.	Tengo que sacarle la muela.
We need to do an exam.	Tenemos que examinarlo (-a).
Are you in pain?	¿Tiene usted dolor?
Does this hurt?	¿Le duele esto?
Bite the gauze.	¡Muerde la gaza!
Use that towel.	¡Use esa toalla!
Drink the water!	¡Beba el agua!
Swish the water!	¡Enjuáguese con el agua!
Open your mouth!	¡Abra la boca!
Please say "ahh!"	¡Diga "ahh," por favor!
Please stick out your tongue.	Saque la lengua, por favor.
Lower/raise your chin.	¡Baje/suba la barba!
Breathe through your nose.	¡Respire por la nariz!
We are going to take some pictures of your teeth.	Vamos a tomarle unas fotografías de los dientes.
This lead apron is for your protection.	Este chaleco de plomo es para su protección.

General Office Terms	Expresiones comunes del consultorio
dental office	el consultorio dental
waiting room	la sala de espera
restroom	los servicios el baño
operatory	sala de operaciones
prescription	la receta la prescripción
dental instruments	los instrumentos dentales
suction	el succionador
x-ray machine	la máquina de rayos-x
x-ray film	la radiografía
receptionist	la recepcionista
dental assistant	la asistente dental
dental hygienist	la higienista dental
dental lab	el laboratorio dental
dental lab technician	el técnico (male)/la técnica (female)

Communication with the Receptionist	Comunicación con la recepcionista
What is your name?	¿Cómo se llama?
How are you, Mr./Mrs./Miss?	¿Cómo está, señor/señora/señorita?
Please sit down.	¡Siéntese, por favor!
The doctor will be with you in a moment.	El doctor/la doctora la verá en un momento.
Everything is going to be fine.	Todo va a estar bien.

FIRST DENTAL APPOINTMENT PRIMERA CONSULTA DENTAL

Chief Complaint	Queja principal
What brought you here today?	¿Qué la trajo aquí hoy?
Are you in pain? Where?	¿Tiene dolor? ¿Dónde?
Where does it hurt the most?	¿Dónde le duele más?
Have you had a serious problem with previous dental work?	¿Ha tenido algún problema serio con previos trabajos dentales?
In case of an emergency, who should we call?	En caso de emergencia, ¿a quién llamamos?
We are going to take your medical history.	Vamos a preguntarle sobre su historia clínica.

Medical History	Historia clínica
Are you under the care of a physician?	¿Está consultando a un doctor?
When was the last time you visited a physician? Why?	¿Cuándo fue la ultima vez que visitó un médico? ¿Por qué?
Are you allergic to penicillin or other medicine?	¿Es alérgico (-a) a la penicilina, yodo o cualquier otro medicamento?
Have you ever had rheumatic fever, a heart murmur, heart surgery, or a joint replacement?	¿Ha tenido fiebre reumática, murmullo/soplo en el corazón, operación del corazón o le han reemplazado alguna articulación?
Are there recent dental x-rays of your teeth that we might borrow? If so, whom can we contact?	¿Le han tomado recientemente radiografías de sus dientes? ¿Podríamos pedirlas prestadas? ¿A quién podemos pedirlas?
Have you had a tumor or cancer? When?	¿Ha tenido un tumor o cáncer? ¿Cuándo?
Have you had a local anesthetic or general anesthetic?	¿Le han dado anestesia local o anestesia general alguna vez?
Have you had a reaction to an anesthetic?	¿Ha tenido reacción a alguna anestesia?
Do you have sinus trouble, asthma, hayfever, or severe headaches?	¿Tiene problemas de sinusitis, asma, alergias o severos dolores de cabeza?

Medical History	Historia clínica
Do you have high, low, or normal blood pressure?	¿Tiene la presión alta, baja o normal?
Have you had a heart attack or pains in your chest?	¿Tiene o ha tenido un ataque al corazón o dolor en el pecho?
Does mild exercise leave you short of breath?	¿Le falta la respiración cuando hace ejercicios ligeros?
Do you have heart problems?	¿Tiene problemas del corazón?
Have you had tuberculosis or another lung problem?	¿Ha tenido tuberculosis o algún otro problema con los pulmones?
Have you had a liver condition (hepatitis, jaundice, or cirrhosis)?	¿Ha tenido algún problema del hígado, (hepatitis, ictericia o cirrosis)?
Have you had sexually transmitted diseases?	¿Ha tenido enfermedades transmitidas sexualmente?
Have you had aphthous ulcers or cold sores?	¿Ha tenido úlceras, fuego o herpes labial?
Do you urinate frequently?	¿Orina frecuentemente?
How many times per night do you get up to urinate?	¿Cuántas veces se levanta por la noche para orinar?
Does anyone in your family have diabetes? Who? mother father brother sister	¿Hay alguna persona en su familia que tenga diabetes? ¿Quién? mamá papá hermano hermana
Do you have diabetes?	¿Tiene diabetes?
Are you controlled by insulin? Diet? Medicine?	¿Está controlada con insulina? ¿Con una dieta? ¿Con medicamento?
Have you had seizures (such as epilepsy or fainting)?	¿Ha tenido ataques o convulsiones (como epilepsia o desmayos)?
Do you take medication for nervousness or depression?	¿Ha tomado medicinas para los nervios o depresión?
Do you have a tendency to bleed longer than normal?	¿Sangra mucho tiempo con cortadas pequeñas? ¿Tiene tendencia a sangrar más de lo normal?

Medical History	Historia clínica
Have you been hospitalized or received medical treatment within the past 5 years?	¿Ha estado en el hospital o ha recibido tratamiento en los últimos cinco años?
Have you taken any of these medications in the last 6 months? Cortisone or other steroids? Anticoagulants or blood thinners?	¿Ha tomado alguna de las siguientes medicinas en los últimos seis meses? ¿Cortisona o otros esteroides? ¿Anticoagulantes o medicinas para la sangre?
Do you have any disease, condition, or problem not listed above? Any family or inherited diseases?	¿Tiene usted alguna enfermedad, o problemas de salud que no estén en este cuestionario? ¿Alguna enfermedad hereditaria?
Are you pregnant? Expected delivery date?	¿Está embarazada? ¿Fecha del parto?
Do you smoke or use tobacco? How many cigarettes per day?	¿Fuma o usa productos de tabaco? ¿Cuántos cigarrillos fuma usted al día?
Do you drink alcoholic beverages? What amount? rarely moderately heavily none	¿Toma bebidas alcohólicas? ¿Cuánto? raramente moderadamente mucho nada
Are you taking medications?	¿Está tomando medicinas?
Which ones, please?	¿Cuáles, por favor?

Dental History	Historia dental
Have you been to a dentist before?	¿Ha consultado un dentista anteriormente?
Have you had an allergic reaction to dental anesthetic?	¿Ha tenido alguna reacción alérgica a la anestesia dental?
Where does it hurt?	¿Dónde le duele?
How long has it hurt?	¿Por cuánto tiempo le ha dolido?
Is it sensitive to cold or hot things?	¿Tiene sensitividad a cosas frías o calientes?
When was this tooth filled?	¿Cuándo le rellenaron este diente?
When was this tooth extracted?	¿Cuándo le sacaron ese diente?
Is the pain throbbing?	¿Es el dolor como una punzada?
Does anything make it feel better or worse?	¿Alguna cosa lo hace sentir mejor o peor?
Do you have a dry mouth?	¿Tiene la boca seca?

Dental Hygiene Appointment	Cita para la higiene dental
How often do you brush your teeth?	¿Cuántas veces se cepilla los dientes?
Do your gums bleed?	¿Sangran sus encías?
Do you use dental floss?	¿Usa seda o hilo dental?
I need to record what I find on your teeth.	Voy a documentar su salud dental.
You have plaque and calculus on your teeth.	Usted tiene placa bacteriana y sarro en sus dientes.
I am going to clean and polish your teeth.	Voy a limpiar y pulir sus dientes.
I am going to scale and debride your teeth.	Voy a hacerle un raspado radicular y alisado radicular en sus dientes.
I am going to give you a fluoride treatment.	Voy a darle un tratamiento de fluoruro.
I am going to place sealants over your molars.	Voy a poner unos sellantes sobre unas muelas.
Sealants protect teeth from decay.	Los selladores protegen sus dientes de picaduras (caries).
Please use a toothpaste with fluoride.	Por favor use una pasta dental que tenga fluoruro.
You have bone loss around your teeth.	Ha perdido hueso alrededor de los dientes.
Your gums bleed.	Sus encías sangran mucho.
You have gum recession.	Tiene retraídas las encías.
You will need surgical treatment of the gum disease to treat the gingiva and bone.	Necesitará cirugía de las encías y del hueso.

End of Appointment/Payment	Terminación de la cita/Pagos
Do you have dental insurance?	¿Tiene seguro dental?
We accept personal checks and credit cards.	Aceptamos cheques y tarjetas de crédito.
You can make payments.	Puede hacer pagos.
It will cost _____ dollars and _____ cents.	Le va a costar _____ dólares y _____ centavos.
We need to see you again. We will give you an appointment.	Necesitamos verla(-o) otra vez. Le vamos a dar una cita.
We want to see you in 6 months.	La(-o) queremos ver en seis meses.
Your next appointment is on (date) at (time).	Su próxima cita es _____ a _____.
Call us if you need to cancel the appointment.	Llámenos si necesita cancelar la cita.
Call us if you have a problem.	Llámenos si tiene problemas.
Our phone number is _____.	Nuestro número de teléfono es _____.

Appendix E

In-Office Preventive Products

FLUORIDE VARNISHES

Product	Manufacturer	Fluoride
AllSolutions	Dentsply 800-989-8825 www.professional.dentsply.com	5% sodium fluoride
CavityShield	Omnii Oral Pharmaceuticals 800-445-3386 www.omniipharma.com	5% sodium fluoride, pH 7.0; 0.25 ml (pediatric) & 0.40 ml (mixed dentition)
Duraflor	Medicom, Inc. 800-361-2862 www.medicom.ca	5% sodium fluoride, pH 7.0, xylitol as sweetener
Duraphat	Colgate Oral Pharmaceuticals 800-938-5388 www.colgateprofessional.com	5% sodium fluoride, pH 7.0
DuraShield	Sultan Dental Products 800-238-6739 www.sultandental.com	5% sodium fluoride
Fluor Protector	Ivoclar Vivadent www.ivoclar.co.nz	0.1% sodium fluoride
Fluoridex Lasting Defense	Discus Dental 800-422-9448 www.discusdental.com	5% neutral sodium fluoride
Fluorilaq	Pascal Company Inc. 425-827-4694 www.pascaldental.com	5% sodium fluoride
Vanish 5% NaF White Varnish	OMNI Preventive Care solutions.3m.com/wps/portal/3M/en_US/preventive-care	5% sodium fluoride
Varnish America	Medical Products Laboratories 800-523-0191 www.medicalproducts laboratories.com	5% sodium fluoride

TOOTHPASTES WITHOUT SODIUM LAUREL SULFATE, CINNAMON, OR METHYLPARABEN

Product	Manufacturer
Advance Toothpaste for Sensitive Teeth	Arm & Hammer/Church & Dwight 800-524-1328 www.churchdwight.com
Biotene Dry Mouth Toothpaste; Biotene Sensitive Toothpaste (sweetened with xylitol; Sensitive contains potassium nitrate)	Laclede, Inc. 800-922-5856 www.laclede.com
CloSYS II Toothpaste	CloSys Dental Herb Co. 888-891-1326
Dr. Ken's Maximum Care Toothpaste	Dr. Ken's Products www.drkens.net
Healthy Teeth & Gums Toothpaste (three dentifrices with fluoride, one without fluoride; contains 10% xylitol)	The Natural Dentist 800-615-6895 www.thenaturaldentist.com
PreviDent Dry Mouth Toothpaste (contains 5000 ppm fluoride in SLS-free prescription dentifrice)	Colgate Oral Pharmaceuticals 800-2COLGATE www.colgate.com
Pro_DenRx brush-on 1.1% neutral sodium dentifrice	Pro-Dentec 800-228-5595
Rembrandt Age-Defying Adult Toothpaste	Oral B/Rembrandt Products 800-268-5217 www.jnj.com
Rembrandt Naturals Toothpaste	Oral B/Rembrandt Products
Rembrandt Whitening Canker Sore Prevention Toothpaste	Oral B/Rembrandt Products
Rembrandt Whitening Natural Toothpaste	Oral B/Rembrandt Products
Revelation Toothpowder	Caswell-Massey 800-526-0500
Sensodyne Cool Gel	Sensodyne Products/ GlaxoSmithKline 866-844-2787

Product	Manufacturer
Sensodyne Tartar Control Toothpaste, Sensodyne (original) Toothpaste	Sensodyne Products
Tom's of Maine Natural Clean & Gentle Care Toothpaste (SLS-free, contains licorice root herb [glycyrrhiza])	Tom's of Maine 800-372-4346 www.tomsofmaine.com/dental
Thermodent Toothpaste	Lee Pharmaceuticals 800-950-5337
Vince Tooth Powder	Lee Pharmaceuticals

XYLITOL PRODUCTS

Xylitol products with therapeutic dosage levels >1.55 g/serving

Product	Manufacturer
Beechies Xylitol gum	Richardson Brands www.richardsonbrands.com
Clen-Dent mints	Finnfoods, Finland 708-735-7819
Healthy Teeth & Gums toothpaste (contains 10% xylitol)	The Natural Dentist www.thenaturaldentist.com
Ice-Breakers gum	Hershey Foods Corp. 800-468-1714 www.ice-breakers.com
Lotte XYLITOL gum	LotteUSA, Inc. www.lotteusainc.com 269-963-6664
Miradent xylitol gum (2 pieces equal therapeutic amount)	Hager Worldwide 800-328-2335 www.hagerworldwide.com
SMINT (mint pastille)	Chupa Chups www.smints.com
Spry oral rinse, mints, gum, gel for infants; Xylitol Toothpaste; RAIN Dry Mouth Spray	Xlear, Inc. www.sprydental.com
Squigle ADA Enamel Saver Toothpaste	Squigle, Inc. 610-605-5556

Product	Manufacturer
Starbucks — Peppermint & Cinnamon gum	Richardson Brands www.richardsonbrands.com
TheraGum, TheraMints, TheraSpray; Control Rx Multi Dentifrice	Omnii Oral Pharmaceuticals 800-445-3386 www.omniipharma.com
V-6 Dental gum, mints	Scanlab, Sweden www.cadburyschweppes.com
Xylichew gum, mints	Naturemart, Finland www.naturemart.com
Xylifresh 100 Cinnamon	Leaf Mfg., Finland
XyloSweet (powder sweetener; packet contains 4 g xylitol)	Xlear, Inc. www.xlearinc.com

Xylitol products not substantiated as efficacious xylitol content[E-1]

Product	Manufacturer
Advance Baking Soda Gum	Church & Dwight 800-523-1328
Altoids Chewing Gum	Callard & Bowser www.altoids.com
Biotene Mouthwash & Biotene Toothpaste	Laclede 800-922-5856
First Teeth Baby Gel	Laclede
Gerber Tooth & Gum Cleanser	Gerber Products www.gerber.com
Rembrandt Naturals Toothpaste	Oral B/Rembrandt Products 800-268-5217 www.jnj.com
Rembrandt Whitening Canker Sore Prevention Toothpaste	Oral B/Rembrandt Products
Rembrandt Whitening Natural Toothpaste	Oral B/Rembrandt Products

[E-1] Products contain xylitol at levels <1.0 g or unknown

Product	Manufacturer
Tom's of Maine Natural Mouthwash	Tom's of Maine, Inc. 207-985-2944, ext. 406 www.tomsofmaine.com
Tom's of Maine Toothpaste for Sensitive Teeth & Natural Toothpaste	Tom's of Maine, Inc.
Trident gum with xylitol	Cadbury Adams USA LLC 800-524-2854

ORAL RINSES WITHOUT ALCOHOL

Product	Manufacturer	Active Ingredients
Biotene Mouthwash	Laclede, Inc. 800-922-5856 www.biotene.com	
BreathRx Anti-Bacterial Mouth Rinse	Discus Dental 800-422-9448 www.discusdental.com	Cetylpyridinium Cl, essential oils
GUM Chlorhexidine Gluconate Oral Rinse USP, 0.12% (Rx only)	Sunstar Butler 800-528-8537 www.jbutler.com	
Prevention Mouth Rinse – no alcohol	Prevention Products 800-473-1205 www.preventionmouthrinse.com	Zinc/hydrogen peroxide
Pro-Health Rinse	Crest www.dentalcare.com	7% cetylpyridinium Cl
Spry Oral Rinse	Xlear, Inc. www.sprydental.com	Herbal extracts, essential oils

Appendix F

Laboratory Studies

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INTRODUCTION

Clinical laboratory procedures may lead to the early detection of disorders with vague signs and symptoms. They may also contribute to the discovery of significant, unexpected conditions or may provide a baseline against which response to, or the safety of, a therapeutic intervention may be measured. Consequently, in some situations, clinical laboratory information may be essential before the initiation of therapy. In other instances, it may be an important component of a diagnostic or therapeutic follow-up examination. Prior to ordering laboratory procedures, the clinician should take a careful medical history, perform a thorough physical examination, evaluate radiographic studies, and then request appropriate tests from the laboratory that will either confirm or exclude the provisional diagnosis. A primary organic abnormality may be reflected in a specific laboratory finding, which may then suggest a specific diagnosis or groups of diagnoses and prompt the clinician to initiate appropriate therapy, consultation, or referral.

TISSUE STUDIES

There are striking clinical and radiographic similarities between lesions that involve the oral soft and hard tissues. It is essential in the differential diagnostic process that all possibilities be considered before arriving at a definitive diagnosis. In some instances, the history of a given lesion, combined with characteristic clinical or radiographic features and appropriate laboratory findings, may confirm the clinical impression. However, at other times a biopsy may be required to arrive at a specific diagnosis. In the head and neck area, this responsibility should rest with the general dentist. Therefore, a biopsy of an oral lesion should be considered a diagnostic rather than a surgical procedure. This is especially true for oral soft tissue lesions. A biopsy must be performed as a matter of course when a lesion does not respond to conventional therapy in 7 to 14 days. Biopsies of osseous lesions or lesions involving the oropharynx and tonsillar region should be referred to the appropriate specialist.

Scalpel Biopsy

A biopsy may be either excisional or incisional. An excisional biopsy is the technique of choice when a lesion is relatively small and is believed to be benign. The lesion is excised in its entirety. An incisional biopsy is indicated when a lesion is large. A pie-shaped wedge is removed to include both normal and abnormal tissue. In some instances, several specimens may have to be taken for adequate microscopic evaluation. Once the decision is made to perform a biopsy, the procedure must be carried out according to certain guidelines (Table F-1).

Brush Biopsy

The oral brush biopsy technique may be used to detect cellular abnormalities involving the surface epithelium. Although this technique is useful for demonstrating atypical epithelial cells, a definitive diagnosis of epithelial dysplasia or squamous cell carcinoma should be established using a conventional biopsy technique. The biopsy brush was designed to obtain a complete transepithelial sample with minimal discomfort to the patient. No significant bleeding is associated with the procedure and topical or infiltration anesthesia should not be used because the anesthetic agent may distort the tissue. With proper use of the brush biopsy technique, an adequate sample of cells from all three layers of the epithelium (superficial, intermediate, and basal) should be obtained. However, it is important to realize that this technique should only be used when an abnormality is detected in the surface epithelium. It should not be

Table F-1. Guidelines for Performing a Biopsy

- Do not inject the anesthetic directly into the lesion.
- Do not crush or macerate the tissue.
- Orient the specimen properly.
- Immediately place the specimen in an appropriate preservative.
- Provide the pathologist with an adequate history, clinical description, photographs, radiographs, and exact location of the lesion.
- If the initial biopsy fails to confirm, or is inconsistent with, the clinical impression, a repeat biopsy and clinical monitoring of the lesion must be performed.

used for the diagnosis of submucosal masses, pigmented lesions, vesiculobullous processes, or infectious diseases.

The OralCDx kit (OralScan Laboratories Inc., Suffern, NY) consists of a sealed and sterile oral brush biopsy instrument, a precoded glass slide and matching coded test requisition form, two single-use alcohol/carbowax fixative packs, an alcohol/polyethylene glycol fixative pouch, and a preaddressed container in which to submit the sample. The test requisition form includes an area for demographic data including the patient's age, sex, and history of tobacco and alcohol use, as well as the location and clinical description of the lesion. All OralCDx slides are stained in accordance with a modified Papanicolaou method. The stained slides are scanned by the OralCDx computer system. This system is specifically designed to detect atypical cellular changes in the surface epithelium. Images of abnormal epithelial cells are identified by the computer system and are individually displayed on a high-resolution color video monitor for further review by a pathologist.

Exfoliative Cytology

Exfoliative cytology is defined as the microscopic examination of cells scraped from the surface of a lesion. When properly performed, oral exfoliative cytology is useful for diagnosing certain viral infections, candidiasis, and tissue changes suggestive of epithelial dysplasia. The procedure is inexpensive, quick, easy, and painless (Table F-2).

Table F-2. Guidelines for Performing Exfoliative Cytology

- Rub a moist tongue depressor gently over the entire surface of the lesion.
- Spread the collected cells evenly on a glass slide.
- Immediately spray the slide with an appropriate fixative.
- Provide the pathologist with an adequate history, clinical description, photographs, and exact location of the lesion.

Table F-3. Gram Staining Method

- Wash with crystal violet for 1 minute.
- Rinse with water.
- Wash with Gram iodine for 1 minute.
- Rinse with water.
- Decolorize with acetone and alcohol.
- Rinse with water.
- Counterstain for 10 to 30 seconds with 2.5% safranin.
- Wash and dry.

Direct Immunofluorescence

Direct immunofluorescence (DIF) is used to detect the presence of immunoglobulin A (IgA), immunoglobulin G (IgG), immunoglobulin M (IgM), the third component of complement 3 (C3), and fibrinogen in a skin and oral mucosal biopsy specimen. The specimen must be kept moist on saline-soaked gauze or piece of filter paper and immediately delivered to the laboratory on ice after completion of the biopsy. If this is not possible, the specimen may be placed in transport medium (Michel solution) and mailed to the laboratory. DIF is used to distinguish between various autoimmune diseases that may affect the skin or oral mucosa.

Indirect Immunofluorescence

Indirect immunofluorescence (IIF) is used to detect the presence of circulating autoantibodies in a patient's serum. Although this procedure may be used to establish an initial diagnosis of an autoimmune disease, it is more often useful for monitoring disease activity following appropriate therapy

Gram Stains

The most valuable and time-tested method for the immediate identification of bacteria is the examination of infected body fluid or other appropriate specimen using a gram-stained smear (Table F-3). The gram-stained smear may provide a clue as to the identity of an infective organism and may aid in the choice of an antibacterial agent before definitive identification by a culture. The gram-stained smear technique is a simple laboratory procedure. It produces diagnostic slides and only requires an oil immersion microscope for interpretation. It separates microorganisms into two general categories: gram-negative organisms, which appear red to pink following discoloration by alcohol and counter staining with safranin, and gram-positive microorganisms, which preclude the extraction of the crystal violet–iodine complex by alcohol and appear deep blue or violet. Based on their morphological appearance, microorganisms responsible for bacterial infections may also be described as cocci or bacilli.

HEMATOLOGY SCREENING

Some of the more common procedures used to diagnose hematological abnormalities are discussed in this section. To understand fully the relevance of these tests, it is necessary to examine the clinical significance of elevated or diminished values for the various determinants included in a complete blood

count (CBC). With an accurate determination of these values, approximately 70 to 80% of all hematological disorders may be diagnosed.

RED BLOOD CELL COUNT (NORMAL: 4–6 MILLION PER mm^3)

The red blood cell (RBC) count expresses the number of RBCs per cubic millimeter of whole blood. The production of RBCs is stimulated by anoxia or hypoxia and inhibited by the number of circulating RBCs. Erythropoietin mediates these responses as cells transport oxygen to tissues and carbon dioxide to the lungs. Erythrocytosis may be caused by dehydration or polycythemia vera. The relationship between the number, size (morphological character as reflected on a blood smear), and hemoglobin concentration of RBCs provides a practical approach to the diagnosis of the common types of anemias (Table F-4).

Hematocrit (Normal: men 42–52%, women 37–47%)

The hematocrit (HCT) is a measurement of the percentage volume of packed RBCs in a unit volume of whole blood and provides information about the number and/or size of RBCs.

Hemoglobin (Normal: men 14–18 mg/100 mL, women 12–16 mg/100 mL)

The hemoglobin (HGB) is a measure of the concentration of the oxygen-carrying molecules in erythrocytes and is reported in milligrams per 100 mL of whole blood.

WHITE BLOOD CELL COUNT (NORMAL: 5,000–10,000 PER mm^3)

The white blood cell (WBC) count expresses the number of WBCs per cubic millimeter of whole blood. The count may vary in a patient during the course of the day. Minor variations outside the normal range are not significant so long as the differential WBC count in the peripheral blood is normal. The differential WBC count is performed on a peripheral blood smear for the purpose of identifying the various types of WBCs and their percentage distribution (Table F-5). This process also gives an estimate of the platelet count and an indication of RBC morphology.

Table F-4. Common Types of Anemias

- Normocytic, normochromic anemia
  - Acute hemorrhage
  - Hemolysis
  - Aplastic anemia
- Microcytic, hypochromic anemia
  - Chronic hemorrhage
  - Iron deficiency
  - Hemoglobinopathies
- Macrocytic anemia
  - Folic acid deficiency
  - Vitamin B_{12} deficiency

Table F-5. Normal Values and Abnormalities Associated With White Blood Cells

The Differential WBC Count: Normal Values

- Neutrophils (43–77%)
- Lymphocytes (17–47%)
- Monocytes (0–9%)
- Eosinophils (0–4%)
- Basophils (0–2%)

Leukocytoses

- Neutrophilic leukocytosis may be caused by physical and emotional stimuli, acute bacterial infections, drug reactions, inflammatory disorders, and myelogenous leukemia.
- Lymphocytosis may be caused by viral infections, chronic bacterial infections, or chronic granulomatous infections; or it may be an indication of lymphocytic leukemia.
- Monocytic leukocytosis may be an indication of infectious mononucleosis, infectious endocarditis, or monocytic leukemia.
- Eosinophilic leukocytosis may be a sign of allergic disorders, parasitic infections, or eosinophilic leukemia.
- Basophilic leukocytosis may be a sign of acute rheumatic fever, polycythemia vera, or myeloproliferative disease.

Leukopenia

- Leukopenia may be the result of diurnal or familial variations in the WBC count, a sign of aplastic anemia, or secondary to bone marrow suppression associated with certain drugs, chemotherapeutic agents, radiotherapy, and other toxins.

EVALUATION OF HEMOSTASIS

Tests for disorders of hemostasis may be categorized as those for the vascular, platelet, and coagulation phases of clot formation.

Vascular Phase

Tourniquet test (Normal: <20)

A blood pressure cuff is inflated to maintain pressure halfway between the systolic and diastolic pressures for 5 minutes. Subsequently, a 2-cm diameter circle is drawn below the antecubital fossa and the number of petechiae are counted.

Platelet Phase

Bleeding time (Normal: 5–8 minutes)

The bleeding time (BT) test measures hemostasis in an induced superficial wound and reflects platelet function. The rate at which a stable thrombus forms

is measured. If the bleeding time is greater than 20 minutes, significant bleeding can be expected.

Platelet count (Normal: 200,000–400,000 per mm^3)

The platelet count measures the number of platelets per cubic millimeter of whole blood. Fewer than 20,000 platelets per cubic millimeter of whole blood suggests an increased risk for uncontrolled bleeding.

Coagulation Phase

Prothrombin time (Normal: 11–16 seconds)

The prothrombin time (PT) reflects the efficacy of the extrinsic pathway of coagulation to induce clot formation. This test is sensitive to reduction in factors II, VII, and X. A prolonged PT may indicate liver disease, vitamin K deficiency, or the level of anticoagulation produced by warfarin therapy. It is performed by adding a mixture of calcium and thromboplastin to citrated plasma. Because the thromboplastins in current use are prepared by different methods, the same PT value may reflect a very different level of anticoagulant effect when different thromboplastins are used. Efforts to solve the problem of variability in the sensitivity of thromboplastins culminated with the adoption by the World Health Organization (WHO) of the international normalized ratio (INR) system. The INR is the PT ratio that one would have obtained if WHO reference thromboplastin had been used to perform the PT on a given blood sample.

In most situations, a moderate-intensity anticoagulant effect with a targeted INR of 2.0 to 3.0 is appropriate. The anticoagulant therapy for patients with prosthetic heart valves is optimal when the INR is between 3.0 and 4.0. When the INR is between 2.0 and 3.0, the risk of bleeding is reduced significantly compared with greater intensity protocols. Bleeding that occurs when the INR is below 3.0 is frequently associated with an obvious underlying cause (e.g., concomitant use of antithrombotic agents) or serious coexisting systemic conditions (e.g., renal insufficiency, anemia, presence of a structural defect, or a tumor in the bladder).

Prior to an oral surgical procedure, an assessment of a patient's level of anticoagulation is imperative to ensure values that may preclude problematic bleeding, yet maintain therapeutic anticoagulation. It is the responsibility of the patient's physician to make dosage adjustments. Warfarin has a plasma half-life of 36 to 42 hours; consequently, any change in the dosage will require about two days to be reflected in the INR value. Once an acceptable therapeutic range has been achieved, the clinician may proceed with the oral surgical procedure. Local anesthesia should be administered with caution to minimize the formation of a hematoma. Meticulous local measures, such as avoiding trauma, positive pressure application, applying local hemostatic agents, and placement of sutures to ensure hemostasis, should be performed. If appropriate, warfarin therapy may be augmented on the day of surgery by a patient's physician if a more intense therapeutic range is preferred for maintenance.

Partial thromboplastin time (Normal: 25–27 seconds)

The partial thromboplastin time (PTT) reflects the efficacy of the intrinsic pathway of coagulation to induce clot formation. A prolonged PTT may indicate a deficiency of blood coagulation factors II, VIII, IX, or X. Such deficiencies are typical of hereditary coagulation disorders. The PTT may also reflect the level of anticoagulation produced by heparin therapy. Heparin therapy is closely

monitored to maintain the ratio of the patient's PTT to the mean control PTT within a defined range. For anticoagulation, a PTT of 1.5 to 2.5 times normal is usually desired. Four hours prior to an oral surgical procedure, heparin therapy should be discontinued. Surgery should be performed using local anesthesia, an atraumatic surgical technique, application of local hemostatic agents, and careful suturing. After the surgical procedure, heparin therapy may be reinstituted the same day if bleeding is not active.

Occasionally, patients taking warfarin may require more extensive surgical intervention. In this situation, the patient should be admitted to a hospital where heparin therapy should be substituted for the warfarin therapy. About 1 to 2 days before the patient is admitted to the hospital, oral warfarin should be discontinued. Following hospital admission, heparin therapy should be initiated. The onset of intravenous heparin is immediate, with a half-life of 1.5 hours and a range of 1 to 2 hours. The initial dosage for intravenous heparin infusion is 50 units/kg followed by 15 to 25 units/kg per hour as a continuous infusion. The dosage may be increased by 5 units/kg per hour every 4 hours according to the PPT results. Postoperatively, warfarin therapy should be reinstituted while the patient continues to be infused with heparin.

BIOCHEMICAL TESTS

Following the analysis of a large number of biochemical profiles, certain patterns emerge that are sufficiently characteristic to suggest a specific diagnosis or group of diagnoses. This is analogous to a pathologist's recognition of tissue patterns following microscopic examination of tissue specimens and may be thought of as a "biochemical biopsy." A primary organic abnormality may be identified based on the results of specific biochemical tests. The results of other biochemical tests may assist a clinician with establishing a diagnosis and may signal secondary involvement of other organ systems. The more common laboratory procedures or biochemical tests are discussed next.

Aspartate Transaminase (Normal: 7–46 mg/dL)

Aspartate transaminase (AST) is an intracellular enzyme found in tissues with high metabolic activity, including the heart, liver, and skeletal muscles. The enzyme is released into the circulation after injury or death of physiologically active cells. An elevated AST level may indicate myocardial infarction, liver disease, or skeletal muscle damage.

Lactate Dehydrogenase (Normal: 100–190 units/L)

Lactate dehydrogenase (LDH) is an intracellular enzyme present in nearly all metabolically active cells, with the highest concentrations found in RBCs, heart, liver, kidneys, and skeletal muscles. Increased serum concentrations usually indicate cell death or enzyme leakage. The LDH is elevated in association with hemolytic disorders, myocardial infarction, liver diseases, renal infarct, and skeletal muscle damage.

Bilirubin (Normal: 0.01–1.0 mg/dL)

Bilirubin is a by-product of hemoglobin metabolism and is derived mainly from physiological RBC destruction in the reticuloendothelial system. It is transported to the liver, where bilirubin is conjugated and eliminated in the bile. A high concentration of bilirubin is an indication of hemolytic disorders, liver disease, or biliary obstruction.

TOTAL PROTEIN (NORMAL: ALBUMIN, 3.5–5.5 MG/DL; GLOBULIN, 2.3–3.5 MG/DL)

Dietary proteins are hydrolyzed in the alimentary canal into amino acids. They are transported to the liver and the reticuloendothelial system for synthesis into body proteins. Albumin, prothrombin, fibrinogen, and a number of other plasma proteins are synthesized in the liver, whereas the gammaglobulins are synthesized mainly in the reticuloendothelial system. In a healthy adult, the normal albumin:globulin ratio is 1.5 to 2.5:1. A reversed albumin-to-globulin ratio is associated with malnutrition, chronic liver disease, and hypergammaglobulinemia.

BLOOD GLUCOSE (NORMAL: 60–100 MG/DL)

Most carbohydrates are metabolized into glucose and are stored in the liver as glycogen. The use of glucose by the body is mediated by insulin, which facilitates its transfer across cell membranes. Hyperglycemia may indicate diabetes mellitus, other metabolic disorders, or a pancreatic tumor. Hypoglycemia may be the result of fasting or it may be induced by certain drugs (e.g, insulin, oral hypoglycemic agents). Occasionally, hypoglycemia is a sign of liver disease or other metabolic disorders.

CHOLESTEROL (NORMAL: 120–200 MG/DL)

The body uses cholesterol in the metabolism of hormones and bile acids. Cholesterol is also an integral part of cell membranes. Cholesterol is synthesized in, and regulated mainly by, the liver. Hypercholesterolemia can be caused by dietary habits, familial conditions, or liver disease.

BLOOD UREA NITROGEN (NORMAL: 5–25 MG/DL)

Blood urea nitrogen (BUN) is the chief nitrogenous byproduct of protein metabolism. It is produced in the liver and excreted primarily by the kidney. Elevated levels of BUN may be a sign of excessive protein metabolism or impaired renal function.

URIC ACID (NORMAL: 3.0–8.5 MG/DL)

Uric acid is a metabolite of nucleic acid degradation. The degradation occurs mainly in the bone marrow and in organs with a high metabolic turnover, such as the liver. The main excretory pathway of uric acid is the kidney. Hyperuricemia may indicate gout, renal failure, or lymphoproliferative or myeloproliferative disorders. It may also be secondary to drug therapy, particularly the thiazide diuretics.

CREATININE (NORMAL: 0.6–1.3 MG/DL)

Creatine, a natural amino acid derivative, is synthesized in the liver, kidneys, and pancreas. It is supplied exogenously through diet (e.g., meat, fish). Cells with high energy requirements such as skeletal muscle use creatine in the form of phosphocreatine. Phosphocreatine serves as a phosphate donor to generate adenosine 5′-triphosphate (ATP) from 5′-diphosphate (ADP). Serum concentrations of creatinine, a waste product of creatine, reflect creatine use. These concentrations are proportional to the body's muscle mass and its excretion by the kidneys. Elevated creatinine concentrations may be an indication of renal dysfunction or acromegaly.

Calcium (Normal: 8.0–10.5 mg/dL)

More than 90% of the calcium in the body is found in the skeleton and teeth. Although the calcium concentration of the extracellular fluid is relatively low, its level is precisely regulated by parathyroid hormone, total protein, vitamin D, and calcitonin. Osteoporosis, hyperparathyroidism, Paget disease, and malignancies may all cause hypercalcemia. Hypocalcemia may be a sign of vitamin D deficiency, pregnancy, hypoparathyroidism, or drug therapy.

Phosphorus (Normal: 2.3–4.7 mg/dL)

About 85% of total phosphorus is combined with calcium in the skeleton and the rest is distributed to other tissues. Phosphorus is involved in most metabolic processes. Parathyroid hormone mediates the rate of absorption of both phosphorus and calcium and regulates phosphate loss and calcium retention by its effect on renal tubular reabsorption. Hyperphosphatemia may result from renal failure, hypoparathyroidism, or hypervitaminosis D. Hypophosphatemia may indicate hyperparathyroidism or vitamin D deficiency.

Alkaline Phosphatase (Normal: 25–100 mg/dL)

Alkaline phosphatase is an enzyme that mediates some of the complex reactions of bone formation and liver activity. When osteoblasts are actively depositing bone matrix, large quantities of heat-labile alkaline phosphatase are secreted. The heat-stable form is produced in the liver. An elevated level of alkaline phosphatase is seen commonly in pregnancy, childhood, Paget disease, and malignancies, or may be an indication of liver disease.

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LWW's Dental Drug Reference with Clinical Implications

Clinical Illustrations

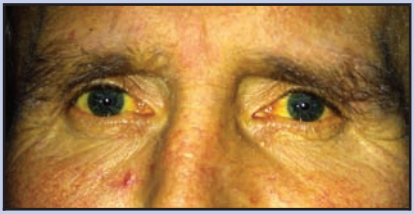


Figure 2-5. Hepatocellular toxicity manifested as jaundice of the sclera of the eyes; the patient had a history of alcohol abuse in association with therapeutic dosages of acetaminophen.

Figure 2-6. Hepatocellular toxicity manifested as jaundice of oral soft tissues; the patient had a history of alcohol abuse in association with therapeutic dosages of acetaminophen.

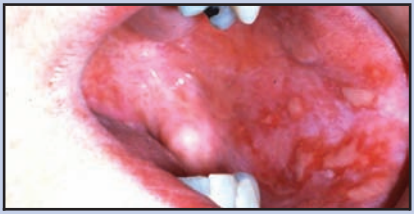


Figure 2-7. Cytotoxic mucositis secondary to a cancer chemotherapeutic regimen including methotrexate.

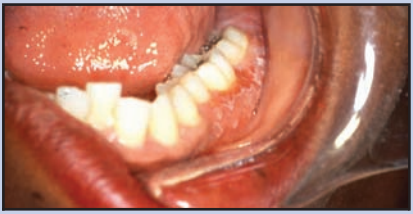


Figure 2-8. Cytotoxic reaction in response to an overdose of 5% topical lidocaine manifested as desquamation of gingival tissues.

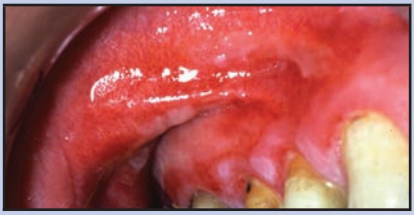


Figure 2-9. Cytotoxic reaction in response to the topical use of acetylsalicylic acid manifested as erythema and desquamation of oral soft tissues.

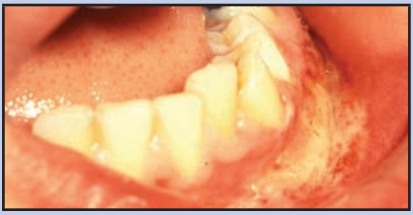


Figure 2-10. Cytotoxic reaction in response to the use of undiluted hydrogen peroxide used for the debridement of an oral ulcerative lesion.

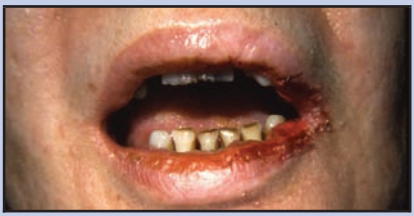


Figure 2-11. Cytotoxic reaction in response to inadvertent overnight contact between the lips and a cotton pellet impregnated with an over-the-counter topical toothache medication (drops) containing eugenol.

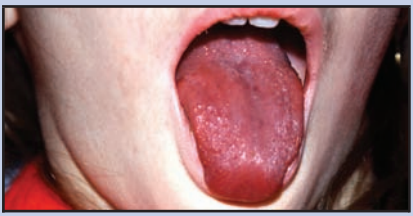


Figure 2-12. Xerostomia in a patient with a psychotic disorder being treated with chlorpromazine.

A-2 CLINICAL ILLUSTRATIONS

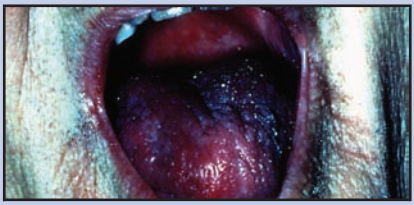


Figure 2-13. Xerostomia and associated candidosis in a patient with congestive heart failure being treated with furosemide.

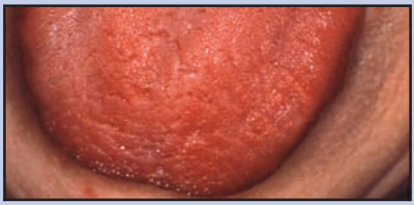


Figure 2-14. Xerostomia in a patient with severe perennial allergies being treated with an antihistamine.

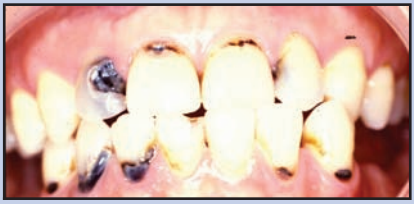


Figure 2-15. Xerostomia and associated cervical caries in a patient with severe perennial allergies being treated with an antihistamine.

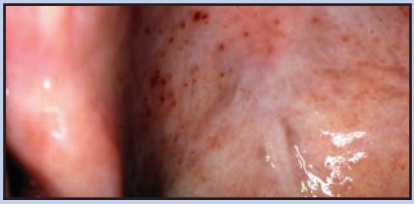


Figure 2-16. Petechial lesions of the oral mucosa in a patient with coronary artery disease being treated with a daily dose (325 mg) of acetylsalicylic acid.

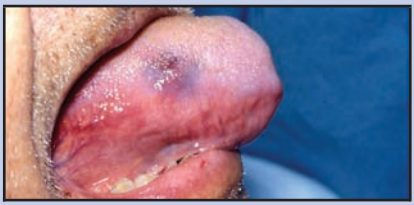


Figure 2-17. Purpuric lesion of the tongue secondary to minor trauma in a patient with an artificial heart valve being treated with warfarin.

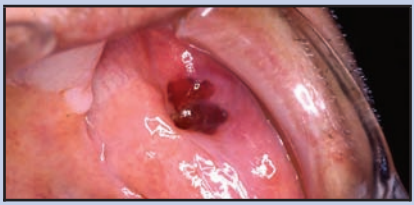


Figure 2-18. Ecchymotic lesion of the buccal mucosa in a patient with acute myocardial infarction being treated with heparin.

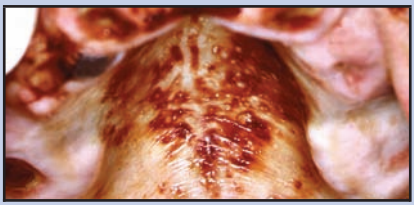


Figure 2-19. Spontaneous bleeding from the gingival tissues of a patient with end-stage renal failure while undergoing hemodialysis with associated heparinization.

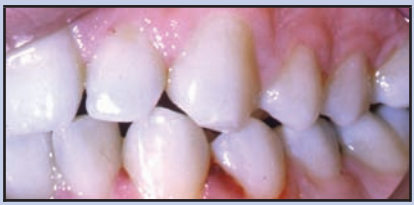


Figure 2-20. Spontaneous gingival bleeding in a patient with profound thrombocytopenia secondary to cancer chemotherapy for leukemia prior to bone marrow transplantation.

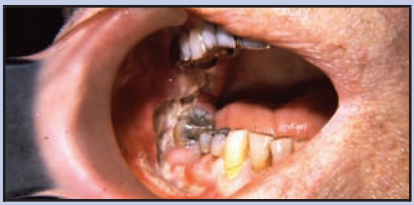


Figure 2-21. Coagulase-negative staphylococcal infection in a patient with leukemia undergoing chemotherapy.

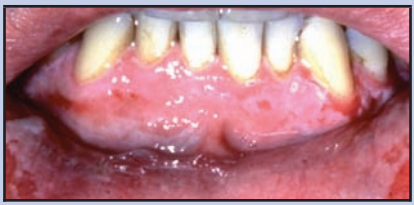


Figure 2-22. Pseudomembranous candidiasis secondary to treatment with a broad-spectrum antibacterial agent.

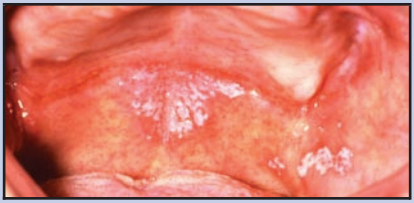


Figure 2-23. Chronic hypertrophic candidosis in a patient with asthma being treated with inhaled corticosteroids.

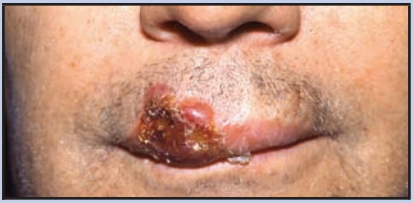


Figure 2-24. Atypical herpes labialis secondary to the reactivation of the latent HSV in a patient with leukemia undergoing chemotherapy.

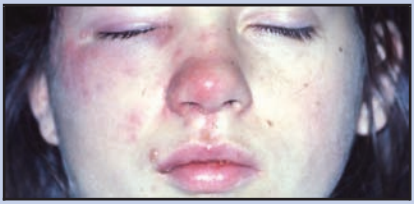


Figure 2-25. Herpes zoster infection involving the maxillary and ophthalmic divisions of the trigeminal nerve secondary to the reactivation of the latent VZV in a patient with leukemia undergoing chemotherapy.

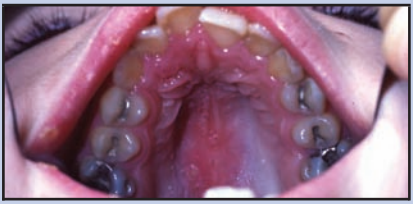


Figure 2-26. Intraoral manifestation of the herpes zoster infection seen in Figure 2-25.

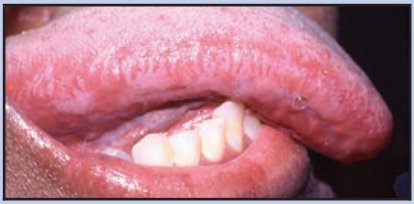


Figure 2-27. Hairy leukoplakia secondary to the reactivation of the latent EBV in a patient on therapeutic immunosuppression following renal transplantation.

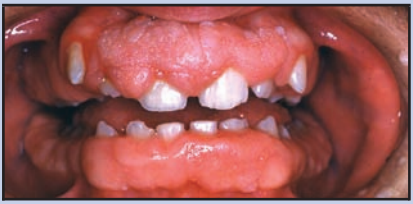


Figure 2-28. Gingival hyperplasia in a patient with a seizure disorder being treated with phenytoin.

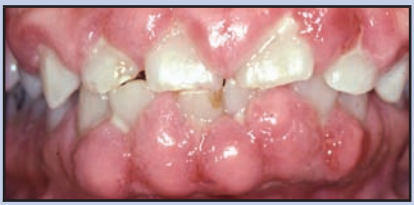


Figure 2-29. Gingival hyperplasia in a patient with hypertension being treated with nifedipine.

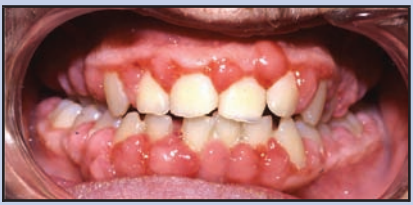


Figure 2-30. Gingival hyperplasia in a patient with a transplanted kidney and renal hypertension being treated with both nifedipine and cyclosporine.

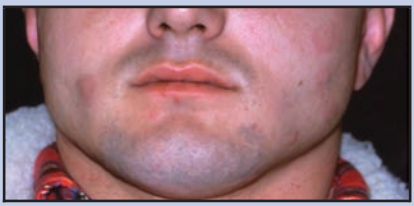


Figure 2-31. Urticaria following the oral administration of cephalexin.

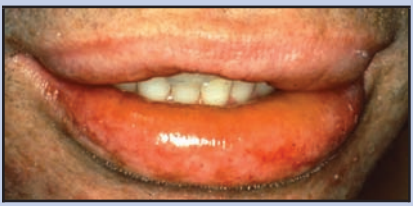


Figure 2-32. Angioedema of the lips following the oral administration of penicillin.

A-4 CLINICAL ILLUSTRATIONS

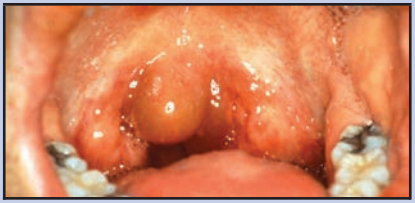


Figure 2-33. Angioedema of the oropharynx following the oral administration of penicillin.

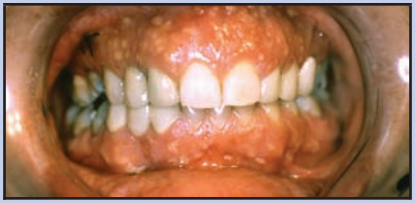


Figure 2-34. Immune-complex hypersensitivity reaction observed on the gums in response to tetracycline therapy for acne.

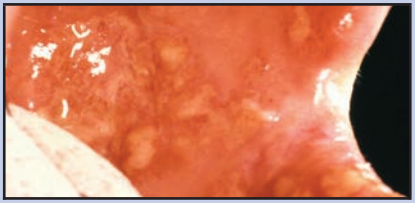


Figure 2-35. Immune-complex hypersensitivity reaction observed in the soft tissue in response to tetracycline therapy for acne.

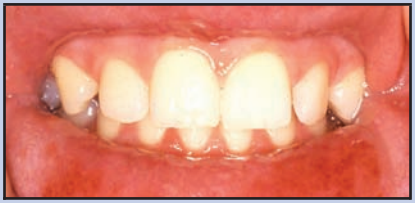


Figure 2-36. Contact mucositis (delayed hypersensitivity reaction) in response to a cinnamon-flavored sugar-free gum.

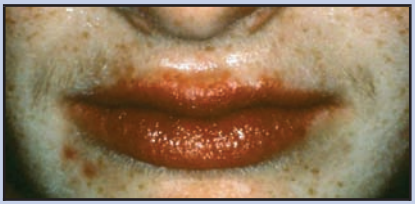


Figure 2-37. Contact mucositis (delayed hypersensitivity reaction) in response to the topical application of bacitracin.

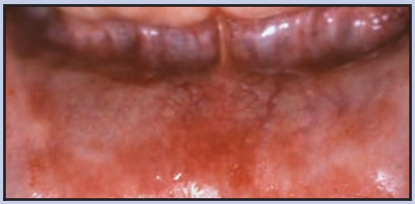


Figure 2-38. Contact mucositis (delayed hypersensitivity reaction) in response to the topical application of bacitracin.

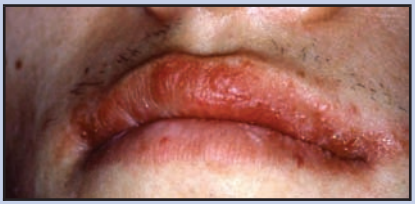


Figure 2-39. Contact mucositis (delayed hypersensitivity reaction) in response to an over-the-counter lip balm containing benzocaine.

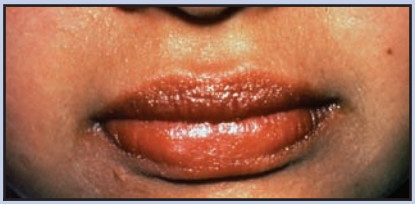


Figure 2-40. Angioedema of the lips in a patient experiencing a pseudoallergic reaction in response to captopril.

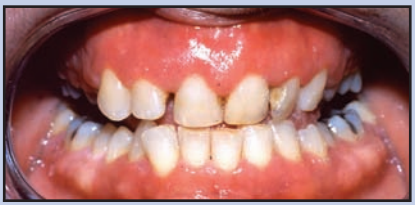


Figure 2-41. Angioedema of the gingiva in a patient experiencing a pseudoallergic reaction in response to captopril.

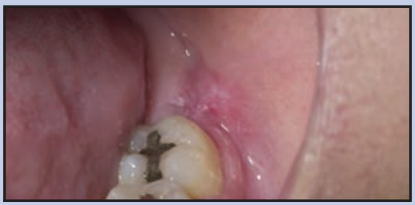


Figure 2-42. Lichenoid stomatitis in a patient with rheumatoid arthritis taking ibuprofen.

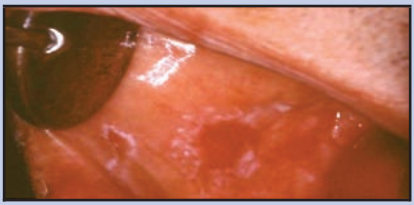


Figure 2-43. Lichenoid stomatitis in a patient with rheumatoid arthritis taking naproxen.

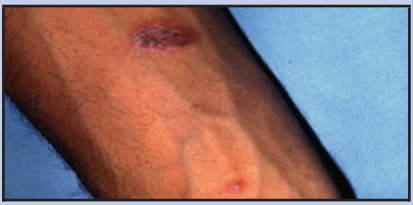


Figure 2-44. Characteristic iris or target lesions of the skin associated with erythema multiforme following the administration of ibuprofen for the treatment of chronic low back pain.

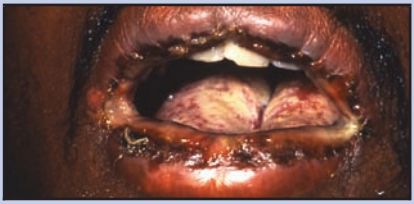


Figure 2-45. Serohemorrhagic crusting of the lips associated with erythema multiforme following the administration of ibuprofen for the treatment of chronic low back pain.

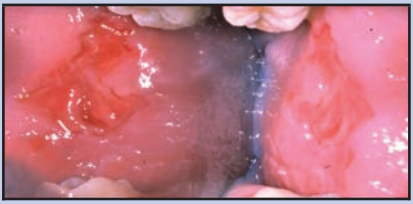


Figure 2-46. Vesiculobullous ulcerations and erosions of the oral mucosa associated with erythema multiforme following the administration of ibuprofen for the treatment of chronic low back pain.

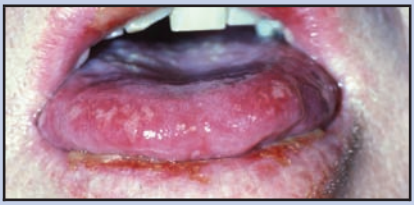


Figure 2-47. Serohemorrhagic crusting of the lips associated with SJS following the administration of phenytoin for the treatment of a seizure disorder.

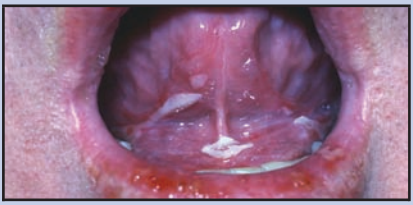


Figure 2-48. Vesiculobullous ulcerations and erosions of the oral mucosa associated with SJS following the administration of phenytoin for the treatment of a seizure disorder.

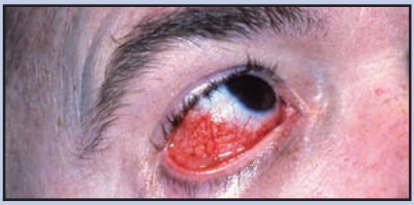


Figure 2-49. Conjunctivitis associated with SJS following the administration of phenytoin for the treatment of a seizure disorder.

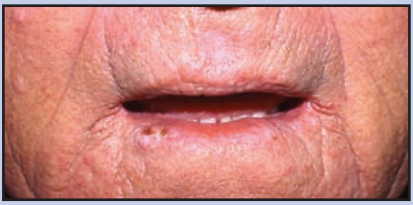


Figure 2-50. SCC of the lip, which developed in a patient 2 years after renal transplantation and the initiation of therapeutic immunosuppression.

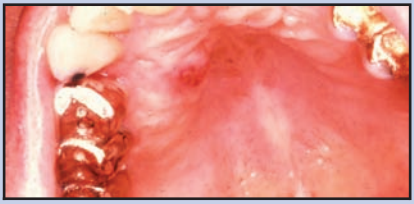


Figure 2-51. Kaposi sarcoma of the palate in a heterosexual patient 4 years after renal transplantation and the initiation of therapeutic immunosuppression.

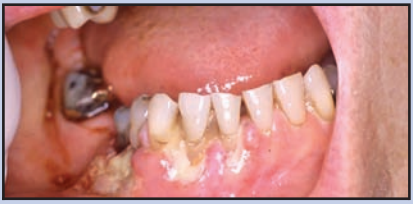


Figure 2-52. Lymphoproliferative disease with gingival infiltration in a patient 3 years after renal transplantation and the initiation of therapeutic immunosuppression.

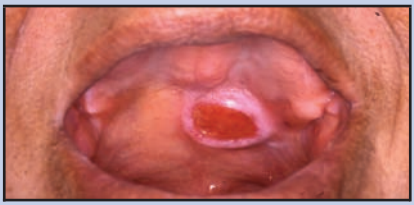


Figure 2-53. Non-Hodgkin lymphoma of the soft palate in a patient 4 years after renal transplantation and the initiation of therapeutic immunosuppression.

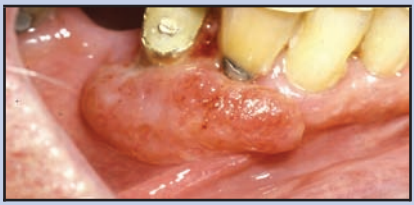


Figure 2-54. Spindle cell sarcoma of the gingiva secondary to the reactivation of EBV in a patient 4 years after renal transplantation and the initiation of therapeutic immunosuppression.

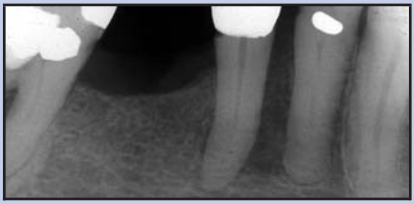


Figure 2-55. Alveolar invasion by spindle cell sarcoma secondary to the reactivation of EBV in a patient 4 years after renal transplantation and the initiation of therapeutic immunosuppression.

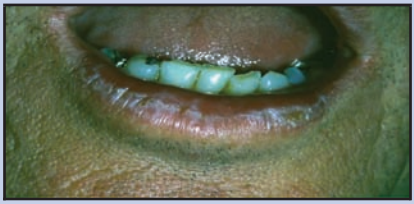
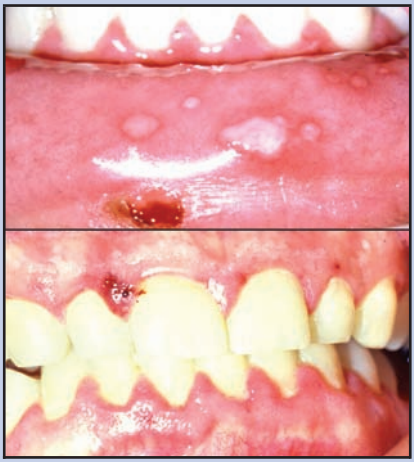


Figure 5-1. Actinic cheilosis. An unobtrusive, dry, mottled, "chapped lip," at times associated with paralleled marked folds with white or grey plaques.



Figures 5-2 and 5-3. Primary herpetic gingivostomatitis. Painful oral lesions characterized by widespread vesicular eruptions and gingival inflammation.

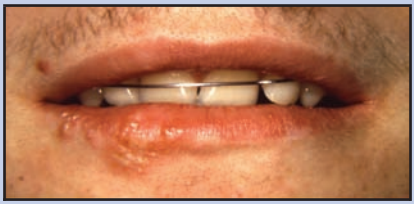


Figure 5-4. Recurrent herpes labialis. Prodromal sensations of tingling, itching, burning, or pain, followed by the eruption of focal vesicular lesions affecting the lip vermilion.

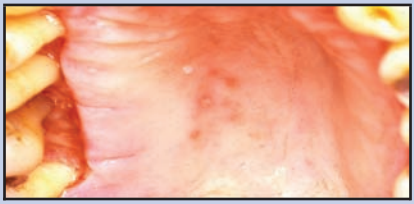


Figure 5-5. Recurrent intraoral herpetic infection. Small clusters of lesions restricted to keratinized mucosa.

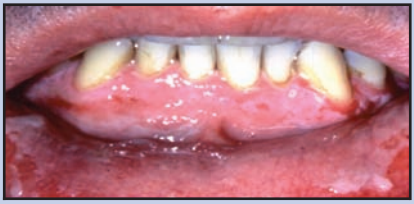


Figure 5-6. Pseudomembranous candidiasis. Creamy, white, curdled milk-like papules or plaques of the gingival and labial mucosa.

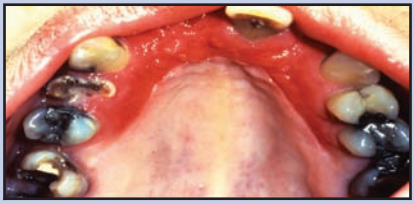


Figure 5-7. Erythematous candidiasis (atrophic). Red patches, most commonly noted in patients wearing a dental prosthesis, usually limited to the denture-bearing surface.

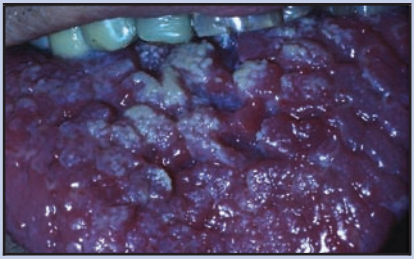


Figure 5-8. Chronic hyperplastic candidiasis. White plaques most commonly noted on the dorsum of the tongue.

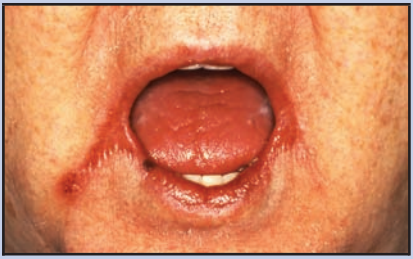


Figure 5-9. Angular cheilitis. Uncomfortable cracking or fissuring of the lip commissures.

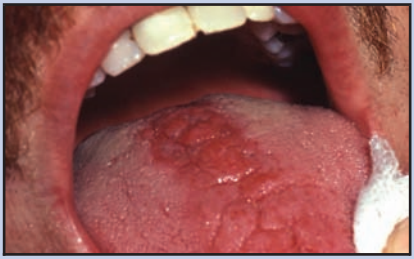


Figure 5-10. Median rhomboid glossitis. Erythematous area of papillary loss confined to the dorsal aspect of the tongue, just anterior to the circumvallate papillae.

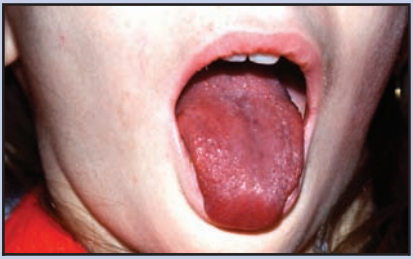


Figure 5-11. Xerostomia. Noticeable lack of wetness of oral tissue with a red, dry, atrophic tongue.

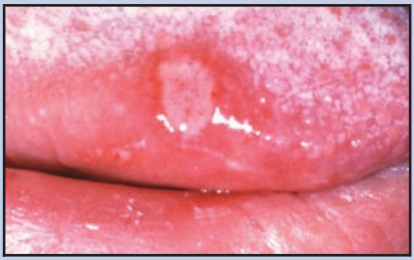


Figure 5-12. Minor recurrent aphthous stomatitis. Recurrent, round, shallow ulceration less than 1 cm in diameter on nonkeratinized mucosa with an intense erythematous halo.

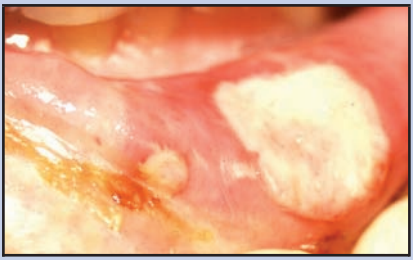


Figure 5-13. Major recurrent aphthous stomatitis. Deep ulcerations larger than 1 cm in diameter on nonkeratinized mucosa, which often persist for weeks to months and may heal with a scar.

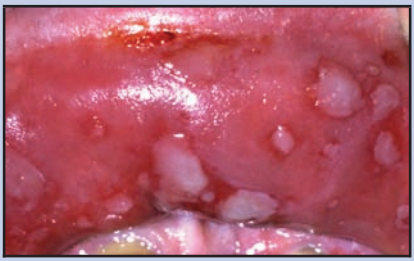


Figure 5-14. Herpetiform recurrent aphthous stomatitis. Clusters of small (2- to 3-mm) shallow ulcerations on nonkeratinized mucosa, which may coalesce to form a more diffuse ulceration.

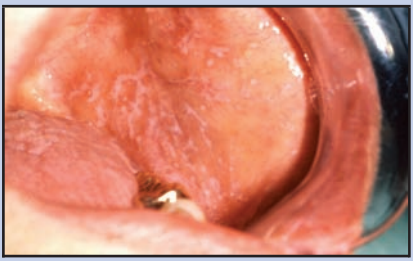


Figure 5-15. Reticular oral lichen planus. Mucosal keratotic lines, plaques, or papules that often create a lacy or reticular pattern (Wickham striae).

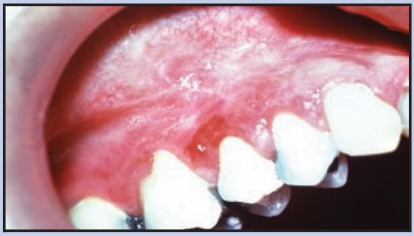
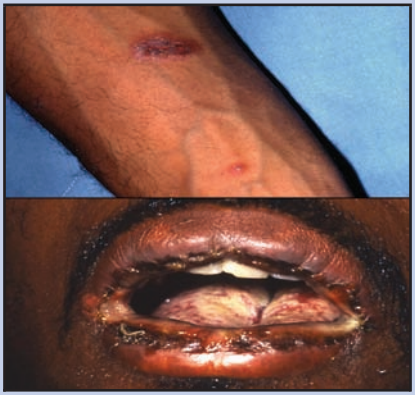
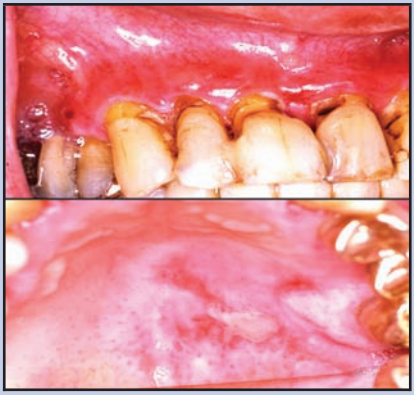


Figure 5-16. Atrophic/erosive oral lichen planus. Painful erythematous and ulcerative areas occurring in reticular oral lichen planus, which may range from a few millimeters to several centimeters.



Figures 5-17 and 5-18. Erythema multiforme. Abrupt onset of mucocutaneous lesions characterized by target lesions of the skin, vesiculobullous erosive oral lesions, and serohemorrhagic crusting of the lips.



Figures 5-19 and 5-20. Cicatricial pemphigoid. Gingival lesions are desquamative, erythematous, painful, and at times hemorrhagic. Primary lesions on the palate are vesiculobullous, which tend to rupture and result in painful erosions.

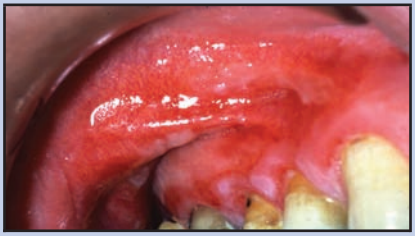
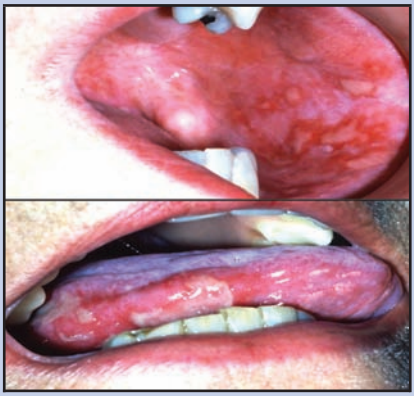


Figure 5-21. Stomatitis is commonly caused by chemical, thermal, or physical trauma. These lesions may present as white or raw bleeding, desquamative, or ulcerative painful lesions.



Figures 5-22 and 5-23. Stomatitis. The most dramatic form of stomatitis is seen in association with chemotherapy (top) and head and neck radiotherapy (bottom), since both of these modalities interfere with cell replication.

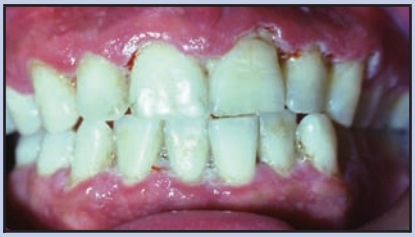


Figure 5-24. Necrotizing ulcerative gingivitis. Unique punched-out crater-like ulcerations affecting the interdental and marginal gingival characterized by spontaneous gingival hemorrhage and pain.