

Appendix I: Alphabetical Monograph Listing

The monographs that follow represent either prototypes for their respective drug classes or drugs that have significant use or clinical considerations in dentistry. The chapters containing the primary discussion of these monographs are listed. The drugs are arranged alphabetically, by their generic name.

Information in these monographs includes—

- Generic Name
- Brand Name(s)
- Use(s)
- Mechanism of action
- Usual Dose
- Side Effects
- Dental Considerations

Generic Name: Acetaminophen (see Chapter Eight, *Analgesics*)

Brand Names: Tylenol, Panadol, Datril

Uses: mild non-prescription analgesic

Mechanism of action: a mild, reversible COX enzyme inhibitor without uricosuric (does not cause changes in uric acid levels, therefore not useful for gout) or anti-inflammatory activity; also, no anticoagulant activity as seen with salicylates

Usual Dose: 5 grains (325mg) every 4 to 6 hours as needed

Side Effects: excessive use can lead to liver damage, with suicide attempts being treated with acetylcysteine (Mucomyst)

Dental Considerations: does not possess anti-inflammatory properties, may therefore be less effective with pain associated with inflammation before or following dental procedures

Generic Name: Acetaminophen with codeine (see Chapter Eight, *Analgesics*)

Brand Name(s): Tylenol #2 (15mg codeine), #3 (30mg codeine), or #4 (60mg codeine)

Use(s): moderate prescription analgesic – controlled substance

Mechanism of action:

Usual Dose: one tablet every four to six hours as needed for pain

Side Effects: fatigue, CNS depression, respiratory depression, enhanced sedation with other CNS depressants, constipation

Dental Considerations: codeine may cause some xerostomia

Acetaminophen with hydrocodone (see hydrocodone with acetaminophen/Vicodin)

Generic Name: Acetylcholine ophthalmic solution

Brand Name: Miochol

Use(s): Miochol is used to constrict the pupil of the eye quickly and completely during cataract surgery and other types of eye surgery

Mechanism of action: Cholinergic action in the eye

Usual dose: 1-4 drops of solution to the eye.

Side effects: rarely shows symptoms of systemic effects; however, it may slow heart rate, cause dizziness or lightheadedness due to low blood pressure, flushing, sweating or abnormal vision.

Dental considerations: While rare, it may increase salivation and SLUD-like cholinergic activity

Generic Name: Albuterol Inhalation (Proventil)

Brand Names: ProAir HFA, Proventil (HFA), Ventolin HFA

Uses: treat or prevent bronchospasm

Mechanism of action: A sympathomimetic (adrenergic) agent that stimulates beta-2 adrenergic receptors in the lungs, resulting in bronchodilation.

Usual Dose: 2-4 mg (1-2 inhalations) 3-4 times a day

Side Effects: Headache, nausea, restlessness, nervousness and tremors, throat dryness and irritation, pharyngitis, blood pressure changes, heartburn and transient wheezing.

Dental Considerations: Monitor vital signs at every appointment because of the cardiovascular and respiratory side effects. Assess salivary flow as a factor in caries, periodontal disease, and candidiasis. Adrenergic agents may cause xerostomia and alterations of taste perception.

Generic Name: Aspirin (ASA, acetylsalicylic acid) (see Chapter Eight , *Analgesics*)

Brand Name(s): Bayer's Aspirin

Use(s): mild analgesic and anti-inflammatory agent; also used as a means of preventing platelet coagulation

Mechanism of action: prostaglandin inhibition

Usual Dose: for analgesia, one 5 grain (325mg) tablet every four to six hours as needed for mild pain; for anticoagulant effect, anywhere from 81mg to 325mg, taken once daily

Side Effects: GI irritation, nausea; allergies occur in about 5% of the population, more frequently among those patients with asthma

Dental Considerations: anticoagulant effect may result in increased gingival bleeding during procedures

Generic Name: Atropine

Brand Names: Sal-Tropine, Isopto Atropine (ophthalmic drops)

Mechanism of Action: Prototype drug for anticholinergic activity. Atropine inhibits action of acetylcholine or other cholinergic stimuli at postganglionic cholinergic receptors, including smooth muscles, secretory glands, and CNS sites. It also reduces secretion of many organs thereby providing a clear operating field pre-op.

Usual Dose: Adults: 0.4 to 0.6 mg every 4-6 hours, children: use lowest effective dose (see chart in text).

Side Effects: Atropine creates the classic anti-SLUD (anticholinergic) environment, with effects that vary with the dose. These include irregular or rapid heart rate, flushing, eye pain, headache, sleepiness, dizziness, increased intracranial pressure, blurred vision, sensitivity to light, changes in taste, xerostomia, decreased sweating, constipation, urinary retention, along with possible hallucinations, muscle twitching, seizures, dermatitis, dry mucous membranes, and tongue chewing.

Dental Considerations: Increase in caries due to xerostomia and oral trauma due to tongue chewing.

Generic Name: Atropine with diphenoxylate - combination product

Brand Name(s): Lomotil

Use(s): oral anti-diarrheal

Mechanism of action: takes advantage of (1) the opiate receptor response associated with constipation and (2) the anticholinergic (anti-SLUDP) activity of atropine

Usual Dose: 1 tablet after each bout of diarrhea, with a maximum of 8 tablets in a 24 hour period

Side Effects: sedation; prolonged use can result in dependence

Dental Considerations: the opiate effect and the anticholinergic effect will combine to cause profound xerostomia; patients using this drug routinely will experience an increase in plaque and caries

Generic Name: Bethanechol

Brand Names: Urecholine, Duvoid

Uses: Treat urinary retention

Mechanism of Action: Cholinergic drug, stimulates parasympathetic nervous system, increasing tone to muscles of urinary bladder

Usual Dose: 25-50mg three or four times a day

Side Effects: wheezing or tightness in chest, vomiting, blurred vision, frequent urge to urinate, stomach discomfort or pain, fall in blood pressure

Dental Considerations: Monitor vital signs at every appointment due to cardiovascular and respiratory side effects. After supine positioning, have patient sit upright for at least 2 minutes to avoid orthostatic hypertension. Cholinergic effects may result in increased salivation.

Generic Name: Capsaicin (*topical*)

Brand Names: Capsin, Capzasin, Zostrix, Zostrix HP.

Use: to help alleviate the pain associated with herpes zoster ("shingles")

Mechanism of Action: May deplete and prevent reaccumulation of substance P, principal transmitter of pain impulses, from periphery to CNS. *Usual Dose:* Apply to affected area 3 times/day.

Side Effects: Burning, stinging, reddened skin. Will cause intense burning if introduced into the eyes or other mucosal tissues.

Dental Considerations: may cause irritation if inadvertently applied to the gums.

Generic Name: Carbachol (Isopto-Carbachol)

Brand Names: Carbotic, Isopto carbachol, Carbostat, Miostat

Uses: treating glaucoma

Mechanism of Action: A direct-acting parasympathomimetic agent that stimulates cholinergic receptors, contracting the iris and other parts of the eye, resulting in reduction of eye pressure

Usual Dose: 1-2 drops of 0.75-3% solution in affected eye(s) up to 3 times daily

Side Effects: blurred vision, eye pain, headache, irritation of eyes, twitching of eye lid

Dental Considerations: avoid dental light in patient's eyes; offer dark glasses for patient comfort.

Generic Name: Carbamazepine (Tegretol)

Brand Name: Tegretol.

Use: antiseizure, for pain associated with trigeminal neuralgia (“tic doloreaux”), and as adjunct therapy in bipolar disorder

Mechanism of Action: CNS depressant activity diminishes frequency of nerve transmission, raising the seizure threshold

Usual Dose: 200mg three times daily

Side Effects: Dizziness, drowsiness, nausea, unsteadiness and vomiting. Rarely may cause severe blood disorders (aplastic anemia and agranulocytosis).

Dental Considerations: May cause xerostomia, leading to ulcers or sores in the mouth

Generic Name: Celecoxib

Brand Name: Celebrex

Use(s): Anti-inflammatory drug for arthritis

Mechanism of action: COX-2 inhibitor (see Chapter Eight, Analgesics, for full discussion)

Usual Dose: 100-200mg once or twice a day

Side Effects: Despite the focus on COX-2 inhibition, with the presumed protective effects on the GI lining, patients still experience stomach upset; it should be taken with food. Recent studies (2005) indicate a correlation to heart failure while using COX-2 inhibitors; whether this results in the removal of COX-2 inhibitors from the market is yet to be seen

Dental Considerations: None of clinical significance

Generic Name: Cephalexin

Brand Names: Keflex, Keftab.

Use: First-generation cephalosporin antibiotic

Mechanism of Action: bactericidal binding to bacterial cell membranes, inhibiting cell wall synthesis.

Usual Dose: (adult) 250mg-500mg four times daily, (children) 25 to 100 mg/day in divided doses.

Side Effects: Vomiting, diarrhea, pseudomembranous colitis (from overgrowth of *Clostridium difficile*), renal impairment, candidal superinfection (oral and vaginal), skin rashes.

Dental Considerations: Candidal overgrowth, erythema multiforme, hemorrhaging (increased bleeding of gingival tissue).

Generic Name: Cevimeline

Brand Name: Evoxac

Use: treatment of xerostomia due to Sjogren disease

Mechanism of Action: cholinergic activity increases the production of saliva.

Usual Dose: 30 mg, three times daily

Side Effects: excessive sweating, nausea, runny or stuffy nose, abdominal pain, loss of appetite, shortness of breath, blurred vision, diarrhea, increased or painful urination

Dental Considerations: Assess salivary flow as a factor in caries, periodontal disease, and candidiasis. Place on frequent recall to assess effectiveness. Monitor vital signs at every appointment due to cardiovascular and respiratory side effects.

Generic Name: Chlorpheniramine

Brand Name: Chlor-Trimeton

Use: Antihistamine

Mechanism of action: Blocks the effect of histamine at histamine receptors. Histamine can produce symptoms of sneezing, itching, watery eyes, and runny nose.

Usual Dose: 4 mg every 6-8 hours, up to 24 mg per day

Side Effects: Drowsiness, dizziness, muscular weakness, hypotension, dry mouth, nose, throat, and lips, urinary retention, thickening of bronchial secretions. Additive effects seen with alcohol.

Dental Considerations: Assess salivary flow as a factor in caries, periodontal disease, and candidiasis. Consider semisupine chair position for patients with respiratory disease.

Generic Name: Ciprofloxacin

Brand Names: Cipro, Cipro XR, Cipro HC (ophthalmic)

Uses: A fluoroquinolone antibiotic to treat bacterial infections.

Mechanism of Action: Inhibits microbial protein DNA replication and transcription

Usual Dose: 250-500mg every 12 hours

Side Effects: Abdominal pain/discomfort, diarrhea, headache, nausea, rash, restlessness, vomiting, potential for candidal overgrowth. Slows the metabolism of many other drugs, including caffeine.

Dental Considerations: Minimize exposure to sunlight. Avoid dental light in patient's eyes; offer dark glasses for patient comfort

Generic Name: Clonidine

Brand Names: Catapres (oral) or Catapres TTS (7-day topical patch)

Uses: Management of hypertension

Mechanism of Action: Works on central alpha-adrenergic receptors to inhibit sympathetic action in the cardiovascular system. Vasodilation results

Usual Dose: 0.1-0.3mg once to twice daily for oral treatment, the patch delivers 0.1-0.3mg daily over a 7 day duration

Side Effects: Constipation, dizziness, drowsiness, dry mouth, nausea and vomiting. Clonidine should not be discontinued abruptly, since this may result in rapid and severe rebound hypertension.

Dental Considerations: Orthostatic hypotension is a possibility with any drug to treat hypertension. Xerostomia is a possible a factor in dental caries, periodontal disease, and candidiasis. Monitor vital signs every appointment due to cardiovascular side effects.

Generic Name: Diazepam

Brand Names: Valium, Diastat

Use: anti-anxiety drug, also used as muscle relaxant or for severe seizures

Mechanism of Action: Prototype for the benzodiazepine group of antianxiety drugs. Potentiates action of GABA, the inhibitory neurotransmitter, resulting in increased neural inhibition and CNS depression.

Used to treat anxiety disorders, alcohol withdrawal symptoms, or muscle spasms.

Usual Dose: IM/IV 2 to 20 mg every 3 to 4 hrs, oral 2-10mg once to three times daily

Side Effects: Sedation, dizziness and headache, blurred vision, depressed hearing, xerostomia

Dental Considerations: xerostomia. If used before an appointment to treat dental-office anxiety, the patient should have someone available for the drive home.

Generic Name: digoxin

Brand Names: Lanoxin, Lanoxicaps, Digitek

Uses: antiarrhythmic, for treating (congestive) heart failure and reducing frequency of chronic atrial fibrillation

Mechanism of Action: Digitalis glycoside increasing the force of contraction of the heart and slowing heart rate

Usual Dose: 0.125-0.25mg once a day

Side Effects: Diarrhea, irregular heart beat, loss of appetite, vomiting, weakness, nausea; disruption of color vision (especially blue/green) and appearance of “halos” around bright lights

Dental Considerations: Monitor vital signs every appointment due to cardiovascular side effects. Avoid dental light in patient's eyes; offer dark glasses for patient comfort. Use vasoconstrictors with caution, in low doses, and with careful aspiration. Avoid use of gingival retraction cord with epinephrine.

Generic Name: diphenhydramine

Brand Name(s): Benadryl

Use(s): antihistamine, occasionally used as a sleep aid - *considered the most sedative of all antihistamines*

Mechanism of action: blocks the effect of histamine at receptor sites; has no effect on histamine already released during an allergic reaction

Usual Dose: 25 to 50mg every four to six hours

Side Effects: most sedative of all antihistamines; xerostomia

Dental Considerations: patients using diphenhydramine on a continuous basis will have pronounced xerostomia

Generic Name: donepezil

Brand Name(s): Aricept

Use(s): treatment of Alzheimer's Disease

Mechanism of action: cholinergic activity in the central nervous system

Usual Dose:

Side Effects: primarily gastrointestinal, due to the cholinergic nature of the drug. Expect a SLUD response

Dental Considerations: patients may present with excessive salivation during treatment with donepezil

Generic Name: Epinephrine

Brand Names: Susphrine, Asthmanefrin

Mechanism of Action: prototype agent for adrenergic response; bronchodilation from beta-agonist effect, increase in heart rate during cardiac emergencies

Usual Dose: 0.3mg-1mg SQ or IV

Side Effects: Tachycardia, headache, loss of appetite, nausea, nervousness and tremors.

Dental Considerations: xerostomia, increase in heart rate. If the patient has been sensitized to catecholamines during general anesthesia, the use of a lidocaine-epinephrine combination in local anesthesia may induce tachycardia

Generic Name: Erythromycin

Brand Names: E-Mycin, EES, Ilosone

Uses: a macrolide, bacteriostatic antibiotic for treating infections with susceptible bacteria

Mechanism of action: binds to bacterial ribosomes, inhibiting bacterial protein synthesis.

Usual Dose: 250-500mg every 6 hours

Side Effects: Abdominal cramping or discomfort, thrombophlebitis, nausea, vomiting, diarrhea, rash and urticaria.

Dental Considerations: Avoid dental light in patient's eyes: offer dark glasses for patient comfort and protect patient's eyes from accidental spatter during treatment.

Generic Name: Estrogen

Brand Names: Menest or Ogen (Esterified Estrogen, derived from plant sources) , Premarin (Conjugated Estrogens from urine of pregnant mares)

Use: hormonal replacement therapy to relieve symptoms of menopause

Mechanism of Action: necessary for growth and development of female reproductive system and secondary sex characteristics; conserves calcium and phosphorus and encourages bone formation; overrides stimulatory effects of testosterone.

Usual Dose: 0.3mg to 2.5mg (esterified tablets), 0.3mg-1.25mg (conjugated tablets)

Side Effects: Conjugated estrogens associated with increased breast cancer rates. Thrombophlebitis and pulmonary embolism, heart attacks and hypertension. Headaches leading to migraine, with depression; anxiety and emotional lability, scalp hair loss and urticaria possible. Other risks include endometrial carcinoma and breakthrough bleeding; dysmenorrhea or amenorrhea; vaginal candidiasis and premenstrual-like syndromes.

Dental Considerations: Possible increased sensitivity to pain

Generic Name: Fentanyl

Brand Name(s): Duragesic (patches), Actiq (lozenges), Sublimaze (injection)

Use(s): Powerful narcotic analgesic (Schedule II)

Mechanism of action:

Usual Dose: for the patches, one patch is applied and replaced every 72 hours, in a dosage and delivery range of 25-100mcg per hour. For the lozenges, the range is one lozenge, allowed to dissolve orally, with a per dose range of 200-800mcg. The injection form of fentanyl is used as a surgical analgesic. Very small amounts of fentanyl provide dramatic pain relief. Fentanyl is used for pain relief in cases of terminal cancer or severe bone pain.

Side Effects: NOT FOR CASUAL ANALGESIA. In fact, a patient known as "opioid naive" (a first time user), is specifically contraindicated for the use of fentanyl. Severe respiratory depression may result. Fentanyl has caused death from inappropriate use. An obvious side effect would be sedation.

Dental Considerations: Like other narcotic analgesics, fentanyl can cause xerostomia. A patient using fentanyl while seeking dental care will be prone to additive CNS depression if other narcotic analgesics are provided.

Generic Name: Fluoxetine

Brand Names: Prozac, Prozac Weekly, Sarafem

Use: antidepressant; note: the product Sarafem is the same drug as Prozac, with the supposedly unique indication of “premenstrual dysphoric syndrome,” a condition that did not exist before the drug Sarafem appeared on the market

Mechanism of Action: a selective serotonin reuptake inhibitor (SSRI), presumed to be linked to inhibition of CNS neuronal reuptake of serotonin. For depression, obsessive compulsive disorder, nervous disorder, and bulimia nervosa

Usual Dose: 10-40mg daily

Side Effects: Headache, insomnia, hypertension, xerostomia, constipation, suicidal ideations

Dental Considerations: xerostomia, taste disruption. Assess salivary flow as a factor in dental caries, periodontal disease, and candidiasis.

Generic Name: Furosemide

Brand Name: Lasix

Use: loop diuretic

Mechanism of Action: enhances excretion of sodium, chloride and potassium by direct action at the ascending limb of the loop of Henle. Treats fluid build-up and swelling caused by congestive heart failure, liver cirrhosis, or kidney disease.

Usual Dose: orally, 20-80mg daily. IV doses, generally given in a hospital setting, have a wide range, limited by side effects

Side Effects: photosensitivity, tinnitus, dizziness, xerostomia possible. Patient should be monitored for hypokalemia (low potassium) with chronic use.

Dental Considerations: orthostatic hypotension, xerostomia. After supine positioning, have patient sit upright for at least 2 minutes before standing to prevent orthostatic hypotension.

Generic Name: Galantamine

Brand Names: Razadyne, Razadyne ER

Use: treatment of Alzheimer’s disease

Mechanism of action: a cholinesterase inhibitor

Usual Dose: initially, 4 mg twice daily, increasing to 8 mg twice daily after four weeks.

Side Effects: cholinergic in nature: nausea, vomiting, diarrhea, anorexia and weight loss, abdominal pain and insomnia.

Dental Considerations: may have increased salivation

Generic Name: Guiafenesin with Codeine

Brand Name(s): Robitussin AC

Use(s): antitussive cough syrup

Mechanism of action: codeine is an opiate, and all such drugs have the potential for antitussive activity; see Chapter Eight, Analgesics

Usual Dose: 1 teaspoonful every four to six hours, as needed, for cough

Side Effects: sedation, constipation

Dental Considerations: patients with routine use of products containing codeine may present themselves with xerostomia, due to the anticholinergic actions seen with the opiates

Generic Name: Heparin

Uses: Anticoagulant

Mechanism of Action: Disruption in the coagulation process

Usual Dose: Subcutaneous, 5000 units every 12 hours. IV doses are usually administered continually at rates of 1000 units/hour.

Side Effects: Irritation or pain at injection site, black stools (indication of internal bleeding), excessive bleeding during oral hygiene care, chills, headaches, stomach pain

Dental Considerations: Increased bleeding from gums when brushing or flossing teeth, swelling of the mouth, face, lips, or tongue. A medical consult is generally considered necessary if oral or maxillofacial surgery or trauma treatment is required while a patient is being treated with heparin. May need to defer treatment.

Generic Name: Hydrocodone with acetaminophen (see Chapter Eight, *Analgesics*)

Brand Name(s): Vicodin, Vicodin ES, Vicodin HP, Lortab, Lorcet, Norco, and many more, all with minute variations of either the hydrocodone or acetaminophen content, or both)

Use(s): narcotic analgesic, combination product – controlled substance

Mechanism of action: powerful opiate receptor agonist (hydrocodone) coupled with mild analgesia from acetaminophen (a postulated COX-3 enzyme inhibitor)

Usual Dose: one to two tablets (of those combinations containing 5mg hydrocodone) or just one tablet (of those combinations with 7.5mg or more of hydrocodone) every four to six hours as needed for pain

Side Effects: CNS depression, respiratory depression, GI upset and nausea (especially with the first dose), constipation – note: all drugs containing hydrocodone are considered highly addictive

Dental Considerations: hydrocodone may cause some xerostomia; these are also very popular drugs of abuse and those patients with “drug seeking behavior” will show considerable creativity in trying to obtain them from whatever source possible, making dental offices a primary target for getting prescriptions

Generic Name: Ibuprofen

Brand Name(s): Motrin, Advil

Use(s): NSAID for pain and inflammation, see Chapter Eight, *Analgesics*

Mechanism of action: COX-1 and COX-2 inhibition resulting in a decrease in prostaglandin synthesis

Usual Dose: 200-800mg three to four times daily, as needed for pain; maximum daily dose is 3200mg (3.2 grams)

Side Effects: stomach upset, nausea; should be taken with food; may interfere with daily aspirin doses used for prevention of heart attack and stroke

Dental Considerations: may increase bleeding during dental procedures

Generic name: Ipratropium bromide (Atrovent)

Brand Name: Atrovent

Use: Bronchodilating agent

Mechanism of action: Anticholinergic drug derived from the stramonium plant, causing a decrease in bronchial secretions

Usual Dose: two inhalations up to four times a day. Patients may take additional inhalations as required; however, the total number of inhalations should not exceed 12 in 24 hours.

Side Effects: nervousness, dizziness, drowsiness, headache, upset stomach, constipation, cough, dry mouth or throat irritation, skin rash, blurred vision, increased difficulty breathing and heart palpitations

Dental Considerations: xerostomia (dry mouth), edema of the tongue, lips and face.

Generic Name: Isotretinoin

Brand Name: Accutane

Uses: For severe cases of acne

Mechanism of action: A vitamin A derivative (a “retinoid”), isotretinoin uses its high lipid solubility to decrease sebum production with antikeratinizing and anti-inflammatory effects.

Usual Dose: 0.5-2 mg daily for 15-20 weeks.

Side Effects: Abnormal hair growth, bleeding or swelling of gingiva, changes in menstrual flow, chapped lips, dry eyes and mouth, peeling skin, voice changes. Photosensitivity and elevation in triglycerides, nausea, vomiting, and abdominal pain. Very teratogenic; women of child bearing age must be also using adequate birth control. Has been associated with contributing to or causing depression even years after use has been discontinued.

Dental Considerations: Patients may rarely develop blood dyscrasias, which can result in infection, bleeding and poor healing. Xerostomia likely. Apply lubricant to dry lips for patient comfort before dental procedures.

Generic Name: Lidocaine

Most Common Brand Names: Xylocaine (topical and injection), Lidoderm (topical patch)

Other Brand Names possible: Anestocaine, Anestacon, Corta-Cap Needle Ease, ELA-max, Lida Mantle, LMX 4, Premjact and Stud 100 (not a dental application), Topicaine, Zilactin-L.

Mechanism of Action: Decreases automaticity in neural cell pathway, decreases action potential duration, and raises ventricular fibrillation threshold; inhibits conduction of sodium in nerve impulses from sensory nerves.

Use: local anesthesia or ventricular antiarrhythmic during cardiac emergencies

Usual Dose:

Side Effects: Few during local anesthesia. However, if injected into a blood vessel, there is the potential for hypotension, bradycardia, drowsiness, nausea, vomiting, respiratory depression, and mental confusion.

Dental Considerations: Bruising and pain at IM site (may cause hematoma). Be sure to aspirate any injection before completely administering lidocaine in dental applications.

Generic Name: Lithium

Brand Names: Eskalith, Lithobid, Lithotabs

Uses: Antidepressant, treatment for bipolar disorder

Mechanism of action: May affect the storage, release, and reuptake of neurotransmitters, especially an increased norepinephrine reuptake or serotonin receptor sensitivity.

Usual Dose: 300 mg 3-4 times daily, adjusted to specific individual patient response

Side Effects: fine hand tremor, polydipsia, polyuria, nausea, and xerostomia. Should never be given with diuretics, as electrolyte depletion increases toxicity. Vomiting, diarrhea, slurred speech, extreme drowsiness, or weakness may be early signs of lithium toxicity.

Dental Considerations: Xerostomia (dry mouth), angioedema of the tongue, lips and face.

Generic Name: Meperidine

Brand Name(s): Demerol

Use(s): synthetic opioid analgesic, Schedule II (see Chapter Eight, Analgesics)

Mechanism of action: opiate receptor agonist

Usual Dose: 50mg every four to six hours as needed for pain

Side Effects: sedation, dependence

Dental Considerations: less xerostomia than seen with opiates such as morphine

Generic Name: Methylphenidate (Ritalin, Concerta)

Brand Names: Ritalin, Methylin, Concerta, Daytrana (topical patch), Metadate

Uses: Treat Attention Deficit Disorder, uncontrollable periods of daytime sleep (narcolepsy)

Mechanism of Action: Stimulates central nervous system

Usual Dose: 10 to 60 mg per day in 2 to 3 doses

Side Effects: Dizziness, drowsiness, headache, loss of appetite, nausea, nervousness, stomach pain, trouble sleeping

Dental Considerations: Monitor vital signs every appointment due to cardiovascular side effects. Assess salivary flow as a factor in dental caries, periodontal disease, and candidiasis. Use vasoconstrictors with caution, in low doses, and with careful aspiration.

Generic Name: Methylprednisolone

Brand Names: Medrol (oral), Solu-Medrol (injection), Depo-Medrol (long-acting injection)

Use: Antiinflammatory

Mechanism of Action: Glucocorticoid antiinflammatory agent (a *steroidal* antiinflammatory) that modifies body's immune response.

Usual Dose: Adults: 4 to 48 mg/day, based on disease state.

Side Effects: Nausea and vomiting (especially with oral forms). Hypertension, vertigo, impaired wound healing, ulcerative esophagitis, increased appetite and weight gain (from both increased appetite and sodium retention)

Dental Considerations: Oral lesions due to immune suppression, with a slower healing response to oral surgeries

Generic Name: Morphine

Brand Name(s): MS-contin (sustained release form, otherwise "morphine sulfate"), see Chapter Eight, Analgesics

Use(s): opiate agonist analgesic, Schedule II

Mechanism of action: opiate receptor agonist

Usual Dose: varies with condition and tolerance of patient; usually 15-30mg every 4 to 6 hours; sustained release versions can be as high as 200mg once or twice a day

Side Effects: sedation, constipation, dependence

Dental Considerations: may produce xerostomia

Generic Name: naloxone

Brand Name(s): Narcan

Use(s): pure opiate receptor antagonist (see Chapter Eight, Analgesics)

Mechanism of action: opiate antagonist with no intrinsic activity

Usual Dose: 0.4mg, administered by injection, for symptoms of overdose or post-surgical respiratory depression; usual total maximum dose is 2mg

Side Effects: may cause liver damage with prolonged use; sedation

Dental Considerations: none

Generic Name: Nicotine

Brand Names: Commit, Habitrol, Nicoderm C-Q, Nicorette, Nicotrol,

Use: Aid in smoking cessation

Mechanism of Action: Nicotine is the primary ingredient in tobacco products. Cholinergic nicotinic receptors accept nicotine from any source, with these controlled quantities being used to reduce cravings

Usual Dose: Transdermal system 8.3 mg-14mg daily, Spray pump 0.5 mg nicotine/actuation, Inhaler 4mg delivered (10mg/cartridge) with each dose. Gum, 2mg if smoking < 25 cigarettes per day, 4mg if smoking >25 cigarettes per day. (Maximum of 24 pieces per day)

Side Effects: Difficulty breathing; swelling of your face, lips, tongue, or throat, seizures, or chest pain or uneven heartbeats

Dental Considerations: Aching jaw from the gum, which is tougher than traditional gum pieces. The adhesive effect of the lozenges has displaced crowns and fillings. Taste sensations are often disrupted, both as a result and because of this treatment. White patches or sores inside the mouth are more likely with the inhalers.

Generic Name: Nitroglycerin

Brand Names: Nitro-Dur, Nitrobid, Nitrostat, Minitran, Nitrek

Uses: Preventing angina (chest pain) caused by ischemia (low oxygen) caused by coronary artery disease

Mechanism of Action: A nitrate, causing relaxation of all vascular smooth muscle and dilation of peripheral arteries and veins. In the heart, the coronary dilation reduces the ischemia causing the angina.

Usual Dose: Sublingually, as needed, 0.4mg, repeated every 5 minutes for up to three doses. If that dosage is ineffective, the patient should call "911" immediately. For prevention of chronic stable angina, oral capsules of 2.5-6.5mg 3 to 4 times a day are used, or a topical patch 0.2-0.4mg/hour during waking hours

Side Effects: *Headache is the most common side effect of nitroglycerin use.* Burning or tingling in mouth, dizziness, flushing, headache, heavy sweating, lightheadedness, nausea, pale skin, vomiting.

Dental Considerations: Monitor vital signs every appointment due to cardiovascular side effects, especially orthostatic hypotension. Stress is a main inducer of chronic stable angina, so ensure that patient's nitroglycerin is easily available if angina occurs. Short appointments and a stress reduction protocol may be required.

Generic Name: Nitrous Oxide

Use: as a very mild anesthetic with analgesic properties during dental procedures

Mechanism of Action: While in use since the 19th century, the mechanism of action for nitrous oxide is unknown. It does have an effect on GABA receptors. Incapable of reaching safe surgical anesthesia with nitrous oxide. The agent does stimulate the body's release of endorphins, promoting pain relief during dental procedures.

Usual Dose: Varies with patient age, physical condition, nature of surgery, and other drugs being used by the patient.

Side Effects: *The biggest concern with the use of nitrous oxide is the potential for hypoxia.* Shivering or trembling, blurred or double vision, dizziness, lightheadedness, or drowsiness; headache; mood or mental changes; nausea (mild) or vomiting

Dental Considerations: nausea; the patient should also be able to communicate with you if hypoxia begins to develop

Generic Name: Omeprazole (Prilosec)

Brand Names: Prilosec

Mechanism of action: A long-acting proton pump inhibitor that inhibits hydrogen ion transport into gastric lumen. It doesn't stop acid production by the cells; it prevents its release.

Usual Dose: 20mg per day, with some unapproved "pH rebalancing" protocols promoting use up to 120mg three times a day

Side Effects: headache, diarrhea, abdominal pain, nausea; long term use usually results in the patient being placed on digestive enzymes to help maintain basic gastrointestinal function

Dental Considerations: some xerostomia

Generic Name: Penicillin

Brand Name: V Cillin K, Veetids

Uses: a bactericidal antibiotic to treat infections caused by bacteria

Mechanism of action: binds to bacterial cell wall, inhibiting bacterial cell wall synthesis

Usual Dose: 250-500mg four times daily

Side Effects: gastrointestinal disturbances (mild diarrhea, nausea, or vomiting), headache, oral or vaginal candidiasis, generalized rash

Dental Considerations: Allergies occur in 5% of the population. Take precautions regarding allergy to medication

Generic Name: Phenobarbital

Brand name: Luminal (not currently available under this name; mentioned here for historical reference only)

Use: Antiseizure and (rarely) antianxiety agent

Mechanism of Action: a barbiturate with CNS depressive actions that raise the seizure threshold

Usual Dose: Varies, based on condition and duration of treatment. Antiseizure doses range from 30-60mg once to four times daily.

Side Effects: Drowsiness, headache, dizziness, depression, excitement, upset stomach, and vomiting.

Dental Considerations: Rarely, some gingival hyperplasia. CNS depression may affect response to general anesthesia or use of nitrous oxide. If patient is developing signs of porphyria, clotting factors may be affected, with increased bleeding possible during procedures.

Generic Name: Phenylephrine

Brand Names: NeoSynephrine

Use: vasoconstrictive agent, used occasionally as an injection after surgery to increase blood pressure, more commonly as a nasal spray to reduce congestion

Mechanism of action: a sympathomimetic (adrenergic) agent acting upon vascular smooth muscle. Usual

Dose: every 4 hours as a nasal spray

Side Effects: transient burning or stinging

Dental Considerations: patients with significant nasal congestion may complicate nasal administration of nitrous oxide/ oxygen sedation

Generic Name: Phenytoin

Brand name: Dilantin

Use: Antiseizure drug, occasionally used as a cardiac antiarrhythmic agent

Mechanism of Action: research suggests that its main mechanism is to block frequency, use and voltage dependent neuronal sodium channels and therefore limit repetitive firing of action potentials. This can mute the action that can precipitate a seizure.

Usual Dose: 100mg, three to four times per day.

Side Effects: *Gingival Hyperplasia*, dizziness and CNS depression, nausea, vomiting, constipation, liver damage

Dental Considerations: *phenytoin is heavily associated with gingival hyperplasia*, with the anterior labial surfaces of the maxillary and mandibular gingiva most often affected

Generic Name: Pilocarpine

Brand Names: Salagen (oral), Isopto-Carpine (ophthalmic)

Uses: Treat dry mouth associated with radiation from cancer or Sjogren syndrome

Mechanism of Action: Cholinergic agent, increases secretion of saliva from salivary glands

Usual Dose: 5mg three to four times a day over a 12 week period

Side Effects: Chills, dizziness, flushing, frequent urination, nausea, runny nose, sweating, vision changes, weakness

Dental Considerations: Assess salivary flow as a factor in dental caries, periodontal disease, and candidiasis. Monitor vital signs every appointment due to cardiovascular side effects.

Generic Name: Pimoline

Brand Name: Cylert

Use(s): used to treat attention-deficit hyperactivity disorder (ADHD). A controlled substance.

Mechanism of Action: Although studies indicate that pemoline may act in animals through dopaminergic mechanisms, the exact mechanism and site of action of the drug in man is not known.

Usual Dose: 37.5mg daily. It may take 3-4 weeks for this medicine to reach its full effect

Side Effects: Difficulty sleeping or drowsiness, dizziness, headache, nausea, stomach pain, or loss of appetite.

Dental Considerations: some mild gingival hyperplasia is possible with ADHD stimulants. Xerostomia is also a possibility.

Generic Name: Pralidoxime

Brand Names: 2-PAM, protopam

Mechanism of action: organophosphates poison by inhibiting the enzyme cholinesterase. With cholinesterase inhibited, acetylcholine levels rise, enhancing its SLUD response. Pralidoxime reverses this action, and when combined with atropine, is part of the antidote to organophosphate or cholinergic poisoning

Use: Generally combined with atropine and most effective within 36 hours of cholinergic or organophosphate poisoning

Usual Dose: 30-50mg/kg either by intravenous therapy or intramuscular injection

Side Effects: blurred or double vision; difficulty in speaking; difficult or rapid breathing; dizziness; fast heartbeat; muscle stiffness or weakness; nausea

Dental Considerations: can cause swelling of lips, tongue, or throat which could lead to a choking feeling

Generic Name: Prazosin

Brand Name: Minipres

Uses: Hypertension and benign prostatic hyperplasia (BPH)

Mechanism of Action: Alpha-adrenergic blocking agent, thought cause blood vessels and muscles around urethra to relax

Usual Dose: 1mg two to three times daily

Side Effects: Constipation, depression, xerostomia, flushing, frequent urination, headache, nasal congestion

Dental Considerations: Xerostomia and orthostatic hypotension

Generic Name: Procaine

Brand Names: Novocain

Use: Local anesthetic

Mechanism of action: causes a reversible blockade of nerve conduction by decreasing nerve membrane permeability to sodium

Usual Dose: rarely used

Side Effects: allergic reaction; chest pain; dizziness or drowsiness; anxiety or restlessness; nausea or vomiting; trembling, shaking or seizures; high level of allergies associated with procaine

Dental Considerations: rarely used; high rates of allergy. To the general public, however, “novocain” is what *all* local anesthetics are. If a patient states an allergy to “novocain,” it is a signal to explore the specific nature of the allergy more carefully.

Generic Name: Propranolol

Brand Names: Inderal

Uses: Treat high blood pressure or atrial fibrillation, decrease angina, prevent migraines, and decrease risk of death after a first heart attack

Mechanism of Action: Prototypical beta-blocker -- note the “-olol” suffix. Beta-adrenergic blockade slows the heart and reduces blood pressure

Usual Dose: 20-320mg per day, in divided doses or single sustained release preparations

Side Effects: Dizziness, drowsiness, lightheadedness, fatigue, feeling cold in the extremities.

Dental Considerations: Orthostatic hypotension fairly common with beta blocking agents. Some xerostomia possible.

Generic Name: Rivastigmine

Brand Name: Exelon

Uses: Slows the progression of symptoms of Alzheimer's disease.

Mechanism of action: A cholinesterase inhibitor increasing the concentration of acetylcholine at cholinergic synapses and enhancing cholinergic function in the CNS.

Usual Dose: Initially, 1.5 mg twice daily, may increase at 2 week intervals to 3 mg then 4.5 mg and finally 6 mg.

Side Effects: Nausea, vomiting, diarrhea, dizziness, headache, and anorexia.

Dental Considerations: Determine why patient is taking drug. Monitor vital signs at every appointment.

Use precaution if sedation or general anesthesia is required; risk of hypotensive episode. May have increased risk of infection, increased bleeding and poor healing.

Generic Name: Scopolamine

Brand Names: Transderm-Scop (topical patch)

Uses: preventing nausea and vomiting associated with motion sickness

Mechanism of action: an anticholinergic that reduces excitability of labyrinthine receptors, depressing conduction in the vestibular cerebellar pathway.

Usual Dose: 1 system q72h.

Side Effects: dry mouth, somnolence, and blurred vision.

Dental Considerations: Avoid dental light in patient's eyes; offer darker glasses for patient comfort.

Caution patients about driving or performing other tasks requiring mental alertness.

Generic Name: Scopolamine

Brand Names: Scopace, Maldemar, Transderm Scop

Uses: Treat certain muscle problems, certain stomach or intestinal problems, and prevent nausea or vomiting associated with motion sickness

Mechanism of Action: Anticholinergic agent, decreases transmission of certain nerve impulses to muscles and in vomiting center of brain

Usual Dose: .4 to .9 mg as needed

Side Effects: Blurred vision, dizziness, dry mouth, drowsiness, mood or mental changes

Dental Considerations: Xerostomia is very common. Xerophthalmia may sensitize patient to dental lights; offer dark glasses for patient comfort.

Generic Name: Tacrine

Brand Names: Cognex

Uses: Slows the progression of Alzheimer's disease.

Mechanism of action: A cholinesterase inhibitor that inhibits the enzyme acetylcholinesterase, thus increasing the concentration of acetylcholine at cholinergic synapses and enhancing cholinergic function in the CNS.

Usual Doses: Initially, 10 mg 4 times daily for 6 weeks, then 20 mg 4 times daily for 6 weeks, then 30 mg 4 times daily for 12 weeks.

Side Effects: Headache, nausea, vomiting, diarrhea, dizziness.

Dental Considerations:

Side Effects: Enhanced SLUD response, dizziness, headache, confusion, anxiety, skin rash, increased sweating, rhinitis, nausea, vomiting, diarrhea, abdominal pain, constipation, urinary incontinence, myalgia.

Dental Considerations: Increased salivation, unpredictable effect on blood pressure

Generic Name: Testosterone

Common Brand Names: Androderm (topical patch), Depo-testosterone (injection)

Uses: Testosterone supplement for men

Mechanism of Action: Promotes growth and development of male reproductive organs, maintains secondary sex characteristics, increases protein anabolism

Usual Dose: 2.5mg to 5mg via topical patch; 50mg to 400mg every two to four weeks (injection)

Side Effects: Acne, bitter taste, change in sex drive, fatigue, gum irritation and pain, hair loss, headache, personality changes and increase in aggression

Dental Considerations: Gum or mouth irritation, gum pain, tenderness, or swelling

Generic Name: Tetracycline

Brand Names: Achromycin V, Sumycin.

Use: bacteriostatic antibiotic

Mechanism of Action: Inhibits bacterial protein synthesis.

Usual Dose: 250-500mg four times daily, on an empty stomach.

Side Effects: Photosensitivity, diarrhea, nausea, vomiting, stomatitis, black hairy tongue, staining of teeth during formation.

Dental Considerations: Stomatitis, black hairy tongue, permanent discoloration of teeth may be caused during tooth development. Enamel hypoplasia has also been reported.

Generic Name: Thalidomide

Brand Names: Thalomid

Uses: Treating skin inflammation in patients with erythema nodosum leprosum and patients with certain types of cancers

Mechanism of Action: Possesses immunomodulatory, anti-inflammatory properties; action not fully understood. In cancer patients, it appears to increase certain natural substances (necrotic factors) that help to kill cancer cells.

Usual Dose: 50mg to 400mg per day after evening meal

Side Effects: Constipation, diarrhea, dizziness, headache, nausea, trouble sleeping, weakness; birth defects among children of either parent using thalidomide

Dental Considerations: Fluorides may increase patient nausea; immunocompromised patients are more prone to oral herpes infections, xerostomia, parotid gland enlargement

Generic Name: Thyroid

Brand Names: Armour Thyroid, Thyroid Strong

Use: thyroid supplement to treat hypothyroidism

Mechanism of action: a natural hormone derived from animal sources, usually beef or pork, that is involved in normal metabolism, growth, and development. Possesses catabolic and anabolic effects.

Provides both levothyroxine and liothyronine hormones (these are available as synthetic derivatives on their own)

Usual Dose: 30-120mg daily (dissicated thyroid)

Side Effects: allergic reaction; nervousness; headache; insomnia; changed in appetite; leg cramps; fever

Dental Considerations: increased nervousness, excitability, sweating, or tachycardia may indicate uncontrolled hyperthyroidism or a dose of medication that is too high. Uncontrolled patients should be referred for medical treatment.

Generic Name: Valproic acid

Brand Names: Depakene, Depakene, Depakote, Depakote ER.

Mechanism of Action: Believed to work by increasing brain levels of gamma-aminobutyric acid (GABA)

Usual Dose: 250-500mg three to four times daily

Use: Initially for seizure disorders, now additionally used for migraine headaches and bipolar disorders

Side Effects: Tremor, somnolence, dizziness, insomnia, blurred vision, taste change, nausea, vomiting, diarrhea, glossitis, periodontal abscess, dry mouth, stomatitis, tooth disorders.

Dental Considerations: Some gingival hyperplasia possible. Coagulation changes may increase gingival bleeding. Taste change, xerostomia, and stomatitis possible.

Generic Name: Warfarin

Brand Names: Coumadin

Uses: Treating or preventing blood clots, reduce the risk of heart attack or stroke

Mechanism of Action: Interferes with hepatic synthesis of vitamin K-dependent clotting factors, resulting in depletion of clotting factors II, VII, IX, and X.

Usual Dose: 1mg to 10mg daily

Side Effects: Bloody stools, blood in urine, shortness of breath, unusual bleeding gums, vision problems

Dental Considerations: Consider local hemostasis measures to prevent excessive bleeding. Increase in bleeding with IM injections may occur.

Generic Name: Zanamivir

Brand Name: Relenza.

Mechanism of Action: antiviral drug that appears to inhibit the influenza virus enzyme neuraminidase, which is essential for viral replication.

Usual Dose: two inhalations twice a day (one 5 mg blister per inhalation) for 5 days

Side Effects: allergy; headache; dizziness; nausea; vomiting; ear, nose, or throat infection, cough, or respiratory problems especially in people with asthma

Dental Considerations: acute influenza patients are unlikely to be seen in the dental office except for dental emergencies, some patients may exhibit rare signs of facial edema

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