Common Home Medications

Alpha$_2$-Adrenergic Agonists

Clonidine (Catapres^R Oral, Catapres-TTS^R Transdermal)

Mechanism of Action: Stimulates alpha$_2$-adrenergic receptors in the CNS. Inhibits the cardioacceleration and vasoconstriction center and decreases blood pressure.

Indications: Management of mild to moderate hypertension. Management of opioid withdrawal.

Adverse Reactions and Side Effects:

CNS: Drowsiness, depression, dizziness, nervousness, nightmares

CV: Bradycardia, hypotension, palpitations

GI: Dry mouth, constipation, nausea, vomiting

Miscellaneous: Withdrawal phenomenon: rebound hypertension

GU: Impotence

Dermatologic: Rash, diaphoresis

Drug Interactions: Additive sedation with CNS depressants. Additive hypotension with other antihypertensives, acute alcohol ingestion, and nitrates. Additive bradycardia with myocardial depressants, such as beta-adrenergic blockers. Sympathomimetics may decrease the antihypertensive effects of clonidine. Withdrawal phenomenon may be increased by discontinuation of beta-adrenergic blockers. Increased risk of cardiovascular effects with concurrent verapamil.

Alpha-Adrenergic Blockers

Doxazosin (Cardura^{R})

Prazosin (Minipress^{R})

Terazosin (Hytrin^{R})

Mechanism of Action: Decrease contractions in smooth muscle of the prostatic capsule by binding to alpha$_1$-adrenergic receptors. Decreases the symptoms of prostatic hypertrophy. Dilates arteries and veins by blocking postsynaptic alpha$_1$-adrenergic receptors to lower blood pressure. Decreases cardiac preload and afterload.

Indications: Treatment of mild to moderate hypertension. Management of the symptoms of benign prostatic hypertrophy.

Adverse Reactions and Side Effects:

CNS: Dizziness, headache, weakness, drowsiness, nervousness, parasthesia

Respiratory: Dyspnea

CV: First-dose orthostatic hypotension, arrhythmias, chest pain, palpitations, peripheral edema, tachycardia

GI: Nausea, vomiting, diarrhea, abdominal pain, dry mouth

GU: Impotence, urinary frequency, priapism

Dermatologic: Pruritis, flushing

HEENT: Nasal congestion, blurred vision

Musculoskeletal: Arthralgia, back pain, gout, myalgia

Drug Interactions: Additive hypotension may occur with acute alcohol ingestion, other antihypertensives, or nitrates. NSAIDs, sympathomimetics, or estrogens may decrease the antihypertensive effects of the alpha-adrenergic blockers. Alpha-adrenergic blockers

may decrease the antihypertensive effects of clonidine.

Tamsulosin (Flomax^{R})

Mechanism of Action: Decreases contractions in smooth muscle of the postatic capsule By binding to alpha$_1$-adrenergic receptors. Decreases symptoms of postatic hypertrophy.

Indications: Management of the symptoms of benign prostatic hypertrophy.

Adverse Reactions and Side Effects:

CNS: Dizziness, headache

CV: Orthostatic hypotension

GU: Retrograde/diminished ejaculation

HEENT: Rhinitis

Drug Interactions: Cimetidine may increase blood levels and risk of toxicity. Increased risk of hypotension with other peripherally acting antiadrenergics(doxazosin, prazosin, terazosin). Concurrent use should be avoided.

Analgesics, Narcotics

Acetaminophen and codeine (Phenaphen With Codeine^{R}, Tylenol #1-4^{R})

Aspirin and codeine (Empirin with Codeine^{R})

Butorphanol (Stadol NS^{R})

Demerol (Meperidine^{R}, Mepergan Fortis^{R})

Fentanyl (Duragesic^{R})

Hydrocodone and acetaminophen (Co-Gesic^{R}, Hydrocet^{R}, Hydrogesic^{R}, Lorcet-HD^{R}, Lorcet Plus^{R}, Lortab^{R}, Vicodin^{R}, Vicodin ES^{R}, Vicodin HP^{R})

Hydrocodone and aspirin (Alor 5/500^{R}, Lortab ASA^{R}, Panasol 5/500^{R})

Hydrocodone and ibuprofen (Vicoprofen^{R})

Hydromorphone (Dilaudid^{R})

Methadone (Dolophine^{R})

Morphine (MS Cotin^{R} Oral, MSIR^{R} Oral, Oramorph^{R} SR Oral, RMS^{R} Rectal, Roxanol^{R} Oral, Roxanol^{R} Rescuedose, Roxanol^{R} SR Oral)

Oxycodone (Oxycontin^{R}, Roxicodone^{R})

Oxycodone and acetaminophen (Percocet^{R}, Roxicet^{R} 5/500, Tylox^{R})

Oxycodone and aspirin (Percodan^{R}, Roxiprin^{R})

Pentazocine (Talwin^{R}, Talwin^{R} NX)

Propoxyphene (Darvon^{R}, Darvon^{R}-N)

Propoxyphene and acetaminophen (Darvocet^{R}-N, Darvocet^{R}-N100, Wygesic^{R})

Mechanism of Action: Bind to opiate receptors in the CNS altering the perception of and response to painful stimuli. Produces generalized CNS depression. Suppresses the cough reflex. Decreases GI motility. Morphine causes vasodilation reducing preload and relieves pulmonary edema associated with myocardial infarction.

Indications: Pain relief, cough suppression, antidiarrheal. In addition, morphine relieves pulmonary edema associated with myocardial infarction.

Adverse Reactions and Side Effects:

CNS: Sedation, confusion, dysphoria, hallucinations, euphoria, headache

Respiratory: Respiratory depression

CV: Hypotension, palpitations, bradycardia

GI: Constipation, nausea, vomiting

Miscellaneous: Physical dependence, psychological dependence, tolerance,

withdrawal syndrome may occur with abrupt discontinuation after chronic use.

GU: Urinary retention

Dermatologic: Diaphoresis, itching, rash

HEENT: Blurred vision, double vision, miosis with all except meperidine

Drug Interactions: Monoamine oxidase inhibitors may produce severe unpredicatable reactions, do not use concurrently. Additive CNS depression may occur with alcohol, antihistamines, sedative/hypnotics, or tricyclic antidepressants. Buprenorphine, butorphanol, nalbuphine, or pentazocine may precipitate withdrawal in physically dependent patients.

Analgesic, Nonsteroidal Anti-Inflammatory Drugs

Diclofenac (Cataflam^{R}, Voltaren^{R}, Voltaren^{R}-XR)

Diclofenac and misoprostol (Arthrotec^{R})

Diflunisal (Dolobid^{R})

Etodolac (Lodine^{R}, Lodine^{R} XL)

Flurbiprofen (Ansaid^{R}, Ocufen^{R})

Ibuprofen (Advil^{R}, Bayer Select^{R} Pain Relief Formula, Children's Advil^{R} Oral Suspension, Children's Motrin^{R} Oral Suspension, Genpril^{R}, IBU^{R}, Ibuprin^{R}, Junior Strength Motrin^{R}, Midol^{R} IB, Motrin^{R}, Motrin^{R} IB, Nuprin^{R})

Indomethacin (Indochron^{R} E-R, Indocin^{R}, Indocin^{R} SR)

Ketoprofen (Orudis^{R}, Orudis^{R} KT, Oruvail^{R})

Ketorolac tromethamine (Toradol^{R})

Mefenamic acid (Ponstel^{R})

Nabumetone (Relafen^{R})

Naproxen (Aleve[R], Anaprox[R], Naprelan[R], Naprosyn[R])

Piroxicam (Feldene[R])

Sulindac (Clinoril[R])

Tolmetin (Tolectin[R] 200, Tolectin[R] 400, Tolectin[R] DS)

Mechanism of Action: Inhibits prostaglandin synthesis. Results in relief of pain, inflammation, and fever.

Indications: Mild to moderate pain. Dysmenorrhea. Inflammatory disorders including rheumatoid arthritis and osteoarthritis. Reduction of fever.

Adverse Reactions and Side Effects:

CNS: Dizziness, drowsiness

Respiratory: Bronchospasm, laryngeal edema

CV: CHF, hypertension, fluid retention and peripheral edema

GI: Peptic or duodenal ulceration, GI bleeding, dyspepsia, nausea, vomiting, diarrhea, epigastric pain

Miscellaneous: Hypersensitivity reactions including asthma, acute respiratory distress, shock-like syndrome, angioedema, or anaphylaxis.

GU: Renal toxicity, hematuria

Dermatologic: Pruritis, rash, urticaria, photosensitivity, dermatitis

Hematologic: Thrombocytopenia, bleeding

Fluids and Electrolytes: Fluid retention, hyponatremia

HEENT: Epistaxis, gingival bleeding, tinnitus, retinal hemorrhage. Ophthalmic use: transient stinging and burning, ocular irritation.

Drug Interactions: Concurrent anticoagulant or salicylate use may increase the risk of

bleeding. NSAIDs may decrease the antihypertensive effect of diuretics or antihypertensives due to sodium and fluid retention. NSAIDs may increase the effects of sulfonamides or oral hypoglycemics..

Analgesic, Salicylates

Aspirin (Anacin^{R}, Arthritis Foundation^{R} Pain Reliever, Ascriptin^{R}, Aspergum^{R}, Bayer^{R} Aspirin, Bayer^{R} Buffered Aspirin, Bufferin^{R}, Ecotrin^{R}, Empirin^{R}, St. JosephR Adult Chewable Aspirin^{R}, ZORprin^{R})

Mechanism of Action: Inhibits prostaglandin synthesis to decrease pain and inflammation. Acts on the hypothalamus heat-regulating center to reduce fever. Blocks prostaglandin synthetase to prevent formation of thromboxane A_2 and prevents platelet aggregation.

Indications: Treatment of minor pain or inflammation. Decreases fever. Prophylaxis of myocardial infarction and cerebral vascular accident. Management of rheumatoid arthritis, rheumatic fever, osteoarthritis, and gout.

Adverse Reactions and Side Effects:

GI: GI bleeding, dyspepsia, epigastric distress, heartburn, nausea

Miscellaneous: Allergic reactions including anaphylaxis and laryngeal edema.

Hematologic: Anemia, hemolysis, increased bleeding time

HEENT: Hearing loss, tinnitus

Drug Interactions: Concurrent use with anticoagulants or NSAIDs may increase risk of bleeding. Concurrent use with NSAIDs or corticosteroids increases risk of GI toxicity.

Analgesic, Miscellaneous

Acetaminophen (Acephen®, Arthritis Foundation® Pain Reliever, Aspirin Free Anacin® Maximum Strength, Feverall™, Genapap®, Infants Feverall®, Panadol®, Tylenol®)

Mechanism of Action: Inhibits the synthesis of prostaglandins to relieve pain and reduce fever.

Indications: Treatment of mild pain or fever.

Adverse Reactions and Side Effects:

GI: Hepatotoxicity

GU: Renal failure

Dermatologic: Rash, urticaria

Drug Interactions: Additive hepatotoxicity may occur with hepatotoxic drugs such as alcohol, diflunisal, isoniazid, rifampin, rifabutin, phenytoin, barbiturates, and carbamazepine. Concurrent use with salicylates or NSAIDs increases the risk of renal toxicity.

Tramadol (Ultram®)

Mechanism of Action: Binds to mu opioid receptors in the CNS causing inhibition of pain pathways, altering the perception of and response to pain. Also inhibits the reuptake of serotonin and norepinephrine in the CNS which also alters the pain pathway.

Indications: Treatment of moderate to moderately severe pain.

Adverse Reactions and Side Effects:

CNS: Seizures, dizziness, headache, drowsiness, hypertonia

GI: Constipation, nausea, vomiting

Miscellaneous: Physical dependence, psychological dependence, tolerance

Dermatologic: Pruritis, diaphoresis

HEENT: Visual disturbances

Drug Interactions: Additive CNS depression may occur when used concurrently with other CNS depressants, such as alcohol, antihistamines, sedative/hypnotics, opioids, anesthetics, or psychotropic agents. Increased risk of seizures may occur with concurrent high doses of penicillins, cephalosporins, phenothiazines, antidepressants, or monoamine oxidase inhibitors. Serotonin syndrome may occur with seritoninergic drugs, such as serotonin reuptake receptor inhibitor antidepressants-concurrent use should be avoided.

Angiotensin II Antagonists

Candasartan (Atacand^{R})

Candasartan/hydrochlorothiazide (Atacand^{R})

Eprosartan (Teveten^{R})

Losartan/hydrochlorothiazide (Hyzaar^{R})

Irbesartan (Avapro^{R})

Losartan (Cozaar^{R})

Telmisartan (Micardis^{R})

Valsartan (Diovan^{R})

Mechanism of Action: Blocks the vasoconstrictor and aldosterone-producing effects of angiotensin II at various receptor sites to lower blood pressure. Combined with hydrochlorothiazide: in addition to action of angiotensin II antagonist, hydrochlorothiazide inhibits sodium reabsorption in the distal tubule of the kidney and increases excretion of sodium, water, chloride, potassium, magnesium, bicarbonate, and hydrogen ions. Actions result in lowering of blood pressure and diuresis.

Indications: Management of hypertension.

Adverse Reactions and Side Effects:

CNS: Dizziness, fatigue, headache

CV: Hypotension

GI: Diarrhea, hepatitis

GU: Renal impairment

Fluid and Electrolytes: Hyperkalemia unless combined with hydrochlorothiazide.

Drug Interactions: Additive antihypertensive effects may occur with concurrent use of other antihypertensives or diuretics. NSAIDs may decrease the effectiveness of angiotensin II antagonists due to sodium and water retention.

Angiotensin Converting Enzyme Inhibitors

Benazepril (Lotensin[R])

Captopril (Capoten[R])

Enalapril (Vasotec[R])

Fosinopril (Monopril[R])

Lisinopril (Prinivil[R], Zestril[R])

Moexipril (Univasc[R])

Perindopril (Aceon[R])

Quinapril (Accupril[R])

Ramipril (Altace[R])

Trandolapril (Mavik[R])

Benazepril/hydrochlorothiazide (Lotensin HCT[R])

Captopril/hydrochlorothiazide (Capozide[R])

Enalapril/hydrochlorothiazide (Vaseretic[R])

Lisinopril/hydrochlorothiazide (Prinizide[R])

Lisinopril/hydrochlorothiazide (Zestoretic[R])

Moexipril/hydrochlorothiazide (Uniretic[R])

Quinapril/hydrochlorothiazide (Accuretic[R])

Trandolapril/hydrochlorothiazide (Tarka[R])

Mechanism of Action: Blocks the conversion of angiotensin I to angiotensin II, a potent vasoconstrictor. Also inactivates vasodilators such as bradykinin and other prostaglandins. Increases plasma renin levels and decreases aldosterone levels. These actions result in lowering of blood pressure and decreased afterload in CHF. Combined

with hydrochlorothiazide: In addition to action of angiotensin converting enzyme inhibitor, hydrochlorothiazide inhibits sodium reabsorption in the distal tubule of the kidney causing increased excretion of sodium, water, potassium, and hydrogen ions.

Indications: Management of hypertension and CHF.

Adverse Reactions and Side Effects:

CNS: Dizziness, fatigue, headache, insomnia, weakness

Respiratory: Cough, eosinophilic pneumonitis

CV: Hypotension, angina pectoris, tachycardia

GI: Taste disturbance, anorexia, diarrhea, nausea

Miscellaneous: Angioedema, fever

GU: Proteinuria, impotence, renal failure

Dermatologic: Rash

Fluids and electrolytes: Hyperkalemia except when combined with hydrochlorothiazide.

Drug Interactions: Excessive hypotension may occur with concurrent use of diuretics. Additive hypotension may occur with concurrent use of other antihypertensives, nitrates, phenothiazines, or acute alcohol ingestion. Hyperkalemia may result from concurrent use of potassium-sparing diuretics, potassium supplements, or cyclosporine. NSAIDs or corticosteroids may decrease the antihypertensive effects.

Antianxiety Agents, Benzodiazepines

Alprazolam (Xanax®)

Diazepam (Valium®, Valrelease®, Diazepam Intensol®)

Lorazepam (Ativan®)

Oxazepam (Serax®)

Mechanism of Action: Act at many levels in the CNS to produce an anxiolytic effect. These effects may be mediated by an inhibitory neurotransmitter, gamma-aminobutyric acid. Produces CNS depression.

Indications: Treatment of anxiety.

Adverse Reactions and Side Effects:

CNS: Dizziness, drowsiness, confusion, hangover, impaired memory, mental depression, paradoxical excitation, slurred speech

Respiratory: Respiratory depression

GI: Constipation or diarrhea, hepatitis, nausea, vomiting.

Miscellaneous: Physical dependence, psychological dependence, tolerance

Dermatologic: Rash

HEENT: Blurred vision

Drug Interactions: Additive CNS depression with other CNS depressants (i.e. alcohol, Antihistamines, antidepressants, opioids, sedative/hypnotics).

Antiarrhythmic Agents, Class I-A

Disopyramide (Norpace®, Norpace® CR)

Procainamide (Procanbid™, Pronestyl®, Pronestyl®-SR)

Quinidine (Cardioquin®, Quinaglute® Dura Tabs®, Quinalan®, Quinidex® Extentabs,

Quinora^{R})

Mechanism of Action: Decrease myocardial excitability and conduction velocity. Disopyramide and quinidine posess anticholinergic properties. Disopyramide has a direct negative inotropic effect.

Indications: Procainamide/quinidine are indicated for management of a variety of atrial and ventricular arrhythmias including: atrial premature contractions, premature ventricular contractions, ventricular tachycardia, paroxysmal atrial tachycardia, and maintenance of normal sinus rhythm after conversion from atrial fibrillation or flutter. Disopyramide is indicated for the suppression or prevention of unifocal and multifocal premature ventricular contractions, paired premature ventricular contractions, and ventricular tachycardia, and superventricular tachycardias.

Adverse Reactions and Side Effects:

CNS: Dizziness, fatigue, headache, confusion, syncope, procainamide-seizures

Respiratory: Disopyramide-dyspnea

CV: Arrhythmias, hypotension, disopyramide-CHF

GI: Anorexia, nausea, vomiting, abdominal cramping, quinidine-hepatitis, disopyramide-constipation, procainamide and quinidine-diarrhea.

Miscellaneous: Procainamide-systemic lupus syndrome, procainamide and quinidine-fever, disopyramide-impaired temperature regulation.

GU: Disopyramide-urinary retention and hesitancy.

Dermatologic: Procainamide and quinidine-rash.

Hematologic: Procainamide-agranulocytosis, eosinophilia, leukopenia, thrombocytopenia. Quinidine-hemolytic anemia, thrombocytopenia.

Endorincology: Disopyramide-hypoglycemia.

HEENT: Quinidine-Blurred vision, double vision, mydriasis, tinnitus.

Disopyramide-Blurred vision, dry eyes, dry mouth and throat.

Drug Interactions: Additive anticholinergic effects may occur with agents having anticholinergic properties (i.e. antihistamines, tricyclic antidepressants, phenothiazines). May have additive or antagonistic effects with other antiarrhythmics. Additive hypotension may occur with concurrent use of antihypertensives, nitrates, and acute alohol ingestion. Cimetidine, diltiazem, verapamil or erythromycin may increase blood levels and risk of toxicity. Quinidine may increase serum levels of digoxin and cause toxicity. Amiodarone increases quinidine levels and risk of toxicity. Phenobarbital, phenytoin, or rifampin increase metabolism of these drugs and may decrease their effectiveness. Quinidine and disopyramide potentiate warfarin and increase the risk of bleeding.

Antiarrhythmic Agents, Class I-B

Mexiletine (Mexitil^{R})

Mechanism of Action: Decreases the duration of the action potential and effective refractory period in cardiac conduction tissue by altering transport of sodium across myocardial cell membranes.

Indications: Prophylaxis or treatment of serious ventricular arrhythmias, including ventricular tachycardia and premature ventricular contractions.

Adverse Reactions and Side Effects:

CNS: Dizziness, nervousness, confusion, fatigue, headache, sleep disorders, tremor, coordination difficulties, paresthesia

Respiratory: Dyspnea

CV: Arrhythmias, chest pain, edema, palpitations

GI: Hepatic necrosis, heartburn, nausea, vomiting

Dermatologic: Rash

Hematologic: Blood dyscrasias

HEENT: Blurred vision, tinnitus

Drug Interactions: Phenytoin, rifampin, cigarette smoking, or phenobarbital may increase metabolism and decrease effectiveness. May increase blood levels and risk of toxicity from theophylline. Additive cardiac effects may occur with other antiarrhythmics.

Tocainide (Tonocard^{R})

Mechanism of Action: Suppresses automaticity of conduction tissue and spontaneous depolarization of the ventricles during diastole to suppress arrhythmias.

Indications: Life-threatening ventricular arrhythmias, including multifocal and unifocal premature ventricular contractions and ventricular tachycardia.

Adverse Reactions and Side Effects:

CNS: Seizures, mood changes, drowsiness, hallucinations, headache, tremor, restlessness, coma, dizziness, depression, paranoia, myasthenia gravis, numbness

Respiratory: Pulmonary fibrosis, pneumonia

CV: Sinus arrest, CHF, arrhythmias, bradycardia, hypotension, palpitations, Tachycardia, angina, conduction disturbances, hypertension

GI: anorexia, diarrhea, nausea, vomiting, abdominal discomfort, constipation,

hepatitis, dyspepsia, dysphagia

GU: Urinary retention

Dermatologic: Alopecia, flushing, rash, diaphoresis

Hematologic: Agranulocytosis, leukopenia, neutropenia, thrombocytopenia

HEENT: Blurred vision, thirst, tinnitus

Drug Interactions: Phenobarbital, phenytoin, rifampin decrease blood levels and decrease effectiveness. Cimetidine increases drug levels and may cause toxicity. Increases levels and risk of toxicity of theophylline.

Antiarrhythmic Agents, Class I-C

Flecainide (Tambocor^{R})

Mechanism of Action: Slows conduction in cardiac tissue by altering transport of ions across cell membranes to suppress arrhythmias.

Indications: Treatment of life-threatening ventricular arrhythmias. Treatment of supraventricular tachyarrhythmias including: PSVT and paroxysmal atrial fibrillation.

Adverse Reactions and Side Effects:

CNS: Dizziness, anxiety, fatigue, headache, mental depression, tremor

CV: Arrhythmias, chest pain, CHF

GI: Anorexia, constipation, hepatitis, nausea, vomiting, stomach pain

Dermatologic: Rash

HEENT: Blurred vision, visual disturbances

Drug Interactions: Increased risk of arrhythmias with other antiarrhythmic agents. Disopyramide, beta-adrenergic blockers, or verapamil may have additive myocardial depressant effects. Amiodarone doubles serum flecainide levels. Flecainide increases

digoxin levels by 15-25%.

Moricizine (Ethmozine[R])

Mechanism of Action: Suppresses abnormal automaticity and prolongs PR interval and QRS duration by blocking fast sodium channels in myocardial tissue. Also has membrane stabilizing and local anesthetic properties. Suppresses life-threatening arrhythmias.

Indications: Treatment of life-threatening ventricular arrhythmias.

Adverse Reactions and Side Effects:

CNS: Dizziness, fatigue, headache, nervousness, sleep disorders, weakness, parasthesia

Respiratory: Dyspnea

CV: Arrhythmias, chest pain, CHF, palpitations

GI: Nausea, vomiting, diarrhea, dry mouth, dyspepsia

Miscellaneous: Drug fever

HEENT: Blurred vision

Drug Interactions: Decreases blood levels and effectiveness of theophylline. Cimetidine increases blood levels and toxicity of moricizine.

Propafenone (Rythmol[R])

Mechanism of Action: Slows conduction in cardiac tissue by altering transport of ions across cell membranes to suppress arrythmias.

Indications: Treatment of life-threatening ventricular arrythmias. Prolongs the time to recurrence of symptomatic paroxysmal atrial arrythmias.

Adverse Reactions and Side Effects:

CNS: Dizziness, shaking, weakness

CV: Supraventricular arrhythmia, ventricular arrythmias, conduction disturbances, angina, bradycardia, hypotension

GI: Altered taste, constipation, nausea, vomiting, diarrhea, dry mouth

Dermatologic: Rash

HEENT: Blurred vision

Drug Interactions: Increases serum digoxin levels by 35-85%. Increases blood levels of metoprolol and propranolol. Increases effects of warfarin May increase cyclosporine levels and risk of nephrotoxicity. Rifampin may decrease serum levels and effectiveness of propafenone.

Antiarrythmic Agents, Class II

See beta-adrenergic blockers

Antiarrythmic Agents, Class III

Amiodarone (Cordarone^{R})

Mechanism of Action: Prolongs action potential and refractory period. Inhibits adrenergic stimulation. Slows the sinus rate, increases PR and QT intervals, and decreases peripheral vascular resistance.

Indications: Management and prophylaxis of life-threatening ventricular arrythmias unresponsive to less toxic agents. Management of supraventricular tachyarrhythmias.

Adverse Reactions and Side Effects:

CNS: Dizziness, fatigue, malaise, headache, insomnia, ataxia, tremor

CV: CHF, worsening of arrhythmias, bradycardia, hypotension

GI: Liver function abnormalities, anorexia, constipation, nausea, vomiting, abdominal pain, altered sense of taste

Dermatologic: Toxic epidermal necrolysis, photosensitivity, blue discoloration

Endocrinologic: Hypo-or hyperthyroidism

HEENT: Corneal microdeposits, abnormal sense of smell, dry eyes, optic neuritis, optic neuropathy, photophobia

Neurologic: Involuntary movement, parasthesia, peripheral neuropathy, poor Coordination

Drug Interactions: Increases blood levels and risk of toxicity from digoxin, class I antiarrythmics, cyclosporine, dextromethorphan, methotrexate, phenytoin, theophylline, and warfarin. Amiodarone levels and effectiveness are decreased by phenytoin. Increased risk of bradyarrhythmias, sinus arrest, or heart block with concurrent use of beta-adrenergic blockers or calcium channel blockers.

Dofelilide (Tikosyn^{R})

Mechanism of Action: Blocks cardiac ion channels responsible for the transport of potassium. Increases monophasic action potential duration and effective refractory period.

Indications: Maintenance of normal sinus rhythm. Delays time to recurrence of atrial fibrillation or flutter in patients with atrial fibrillation or flutter of greater than one week duration and who have converted to normal sinus rhythm. Conversion of atrial fibrillation

or flutter to normal sinus rhythm.

Adverse Reactions and Side Effects:

CNS: Dizziness, headache

CV: Ventricular arrhythmias, chest pain, QT interval prolongation

Drug Interactions: Concurrent use with cimetidine, trimethoprim, amiloride, ketoconazole, metformin, megestrol, prochloperazine, verapamil, erythromycin, protease inhibitor antiretrovirals, selective serotonin reuptake inhibitor antidepressants, amiodarone, diltiazem, nefazodone, quinine, zafirlukast, and triamterene increases blood levels, the risk of serious arrhythmias, and is contraindicated. Bepridil, erythromycin, phenothiazines, and tricyclic antidepressants prolong QT interval and should not be used concurrently. Dofelilide should not be used concurrently with class I or III antiarrhythmics due to increased risk of arrhythmias. Hypokalemia or hypomagnesemia from potassium depleting diuretics increases the risk of arrhythmias. Concurrent use of digoxin may increase the risk of arrhythmias.

Antiarrhythmic Agents, Class IV

See calcium channel blockers

Antiarrhythmic Agents, Miscellaneous

Digoxin (Lanoxicaps^{R}, Lanoxin^{R})

Mechanism of Action: Increases the force of myocardial contraction. Prolongs the refractory period of the AV node. Decreases conduction through the SA and AV nodes. Increases cardiac output and decreases heart rate.

Indications: Treatment of CHF. Treatment of tachyarrhythmias, including atrial fibrillation and flutter, acts to slow the ventricular rate. Treatment of paroxysmal atrial tachycardia.

Adverse Reactions and Side Effects:

CNS: Fatigue, headache, weakness

CV: Arrhythmias, bradycardia

GI: Anorexia, nausea, vomiting, diarrhea

Hematologic: Thrombocytopenia

Endocrinologic: Gynecomastia

HEENT: Blurred vision, yellow vision

Drug Interactions: Thiazide and loop diuretics, piperacillin, ticarcillin, amphotericin B, and corticosteroids may cause hypokalemia and increase risk of toxicity. Quinidine, cyclosporine, amiodarone, verapamil, diltiazem, propafenone, and diclofenac increase serum levels and may lead to toxicity. Additive bradycardia may occur with beta-adrenergic blockers and other antiarrhythmic agents. Absorption of digoxin is decreased by concurrent antacids, kaolinpectin, cholestyramine, or colestipol. Thyroid hormones may decrease the therapeutic effect of digoxin.

Antibiotics, Anaerobic

Clindamycin (Cleocin HCl^{R}, Cleocin Pediatric^{R}, CleocinT^{R}, Clinda-Derm^{R} Topical Solution, Clindets^{R} Pledgets, C/T/S^{R} Topical Solution)

Mechanism of Action: Inhibits protein synthesis.

Indications: PO-Treatment of skin and skin structure infections, respiratory tract

infections, gynecologic infections, osteomyelitis, and endocarditis prophylaxis. Topical-severe acne. Vaginal-bacterial vaginosis.

Adverse Reactions and Side Effects:

CNS: Dizziness, headache, vertigo with po use.

CV: Arrhythmias, hypotension with po use.

GI: Pseudomembranous colitis, diarrhea, nausea, vomiting with po use.

Dermatologic: Rash

Drug Interactions: PO-kaolinpectin may decrease absorption. May enhance the neuromuscular blocking effects of neuromuscular blocking agents. Topical: Concurrent use with irritants, abrasives, or desquamating agents may result in additive irritation.

Metronidazole (FlagylR, MetroGel^{R} Topical, MetroGel^{R}-Vaginal)

Mechanism of Action: Disrupts DNA and protein synthesis in susceptible organisms.

Indications: PO-Treatment of the following anaerobic infections: gynecologic, skin and skin structure, lower respiratory tract, bone and joint. Amebicide in the treatment of amebic dysentery, amebic liver abcess, and trichomoniasis. Treatment of peptic ulcer disease caused by Helicobacter pylori. Treatment of giardiasis. Treatment of antibiotic-associated pseudomembranous colitis. Topical-treatment of acne rosacea. Vaginal-management of bacterial vaginosis.

Adverse Reactions and Side Effects:

CNS: Seizures, dizziness, headache with po use.

GI: Abdominal pain, anorexia, nausea, vomiting, diarrhea, dry mouth, furry tongue, glossitis, unpleasant taste with po use.

Miscellaneous: Superinfection

Dermatologic: Rash, urticaria. Topical-burning, mild dryness, skin irritation, transient redness.

Hematologic: leukopenia with po use.

HEENT: Tearing with topical use.

Neurologic: Peripheral neuropathy with po use.

Drug Interactions: Cimetidine may decrease the metabolism of metronidazole and increase risk of toxicity. Phenobarbital increases the metabolism of metronidazole and may decrease effectiveness. Metronidazole increases the effects and risk of bleeding with warfarin. A disulfiram-like reaction may occur with alcohol ingestion. May cause acute psychosis and confusion with disulfiram.

Antibiotic, Aminoglycosides

Gentamicin (Garamycin^{R}, Genoptic^{R}, Ocumycin^{R})

Tobramycin (AKTob^{R} Ophthalmic, Tobrex^{R} Ophthalmic)

Mechanism of Action: Inhibits protein synthesis in bacteria.

Indications: Topical/ophthalmic-treatment of localized infections due to susceptible organisms.

Adverse Reactions and Side Effects:

Miscellaneous: Hypersensitivity reactions

HEENT: Ophthalmic-burning, stinging, blurred vision

Drug Interactions: None.

Antibiotics, Cephalosporins

Cefadroxil (Duricef^{R}) Cefprozil (Cefzil^{R})

Cephalexin (Keflex®, Keftab®)

Cefuroxime (Ceftin®)

Cephradine (Velosef®)

Cefdinir (Omnicef®)

Cefaclor (Ceclor®, Ceclor® CD)

Cefixime (Suprax®)

Cefpodoxime (Vantin®)

Cefibuten (Cedax®)

Mechanism of Action: Binds to bacterial cell wall membrane, causing cell death.

Indications: Treatment of skin and skin structure infections, respiratory tract infections, otitis media, urinary tract infections, bone and joint infections, and gynecologic infections.

Adverse Reactions and Side Effects:

CNS: Seizures

GI: Pseudomembranous colitis, diarrhea, nausea, vomiting, abdominal cramps

Miscellaneous: Allergic reactions, including anaphylaxis and serum sickness, superinfection

Dermatologic: Rash, urticaria

Hematologic: Bleeding, blood dyscrasias, hemolytic anemia

Drug Interactions: Concurrent use of large doses of cephalosporins and NSAIDs may increase the risk of bleeding. Concurrent use of loop diuretics or nephrotoxic drugs may increase the risk of nephrotoxicity.

Antibiotics, Macrolides

Azithromycin (Zithromax®, Zithromax Z-Pak®)

Clarithromycin (Biaxin®)

Erythromycin (E.E.S.®, E-Mycin®, EryC®, EryPed®, Ery-Tab®, Erythrocin®, Ilosone®, PCE®)

Erythromycin and benzoyl peroxide (Benzamycin^{R})

Mechanism of Action: Inhibits protein synthesis in bacteria.

Indications: PO-Treatment of the following infections caused by susceptible organisms: upper and lower respiratory infections, otitis media, skin and skin structure, pertussis, diphtheria, erythrasma, intestinal amebiasis, pelvic inflammatory disease, non-gonococcal urethritis, syphilis, legionnaire's disease, rheumatic fever. Useful in situations in which penicillin is the most appropriate drug but cannot be used because of previous hypersensitivity reactions, including: streptococcal infections, syphilis, or gonorrhea. Topical-treatment of acne. Ophthalmic-Treatment of susceptible infections.

Adverse Reactions and Side Effects:

GI: Nausea, vomiting, diarrhea, abdominal pain, abdominal cramps, hepatitis, pseudomembranous colitis

Miscellaneous: Allergic reactions, superinfection

GU: Nephritis, vaginitis

Dermatologic: Rash, photosensitivity

Drug Interactions: Aluminum- and magnesium-containing antacids decrease serum levels and effectiveness of azithromycin. The macrolides may increase serum levels and risk of toxicity from pimozide, theophylline, digoxin, or carbamazepine. Erythromycin may increase the effects and risk of bleeding from warfarin. Erythromycin or clarithromycin increases the risk of serious arrhythmias when used concurrently with cisapride, pimozide, or sparfloxacin. Concurrent use of erythromycin with rifabutin or rifampin may decrease the effectiveness of erythromycin and increase the risk of GI adverse effects. Concurrent use of erythromycin with HMG CoA-reductase inhibitors increases

the risk of serious myopathy or rhabdomyolysis. Topical-concurrent use with irritants, abrasives, or desquamating agents may result in increased irritation.

Antibiotics, Miscellaneous

Bacitracin and Polymyxin B (Polysporin[R] Ophthalmic, Polysporin[R] Topical)

Bacitracin, Neomycin, and Polymyxin B (Mycitracin[R] Topical, Neosporin[R] Ophthalmic Ointment, Neosporin[R] Topical Ointment, Triple Antibiotic[R] Topical)

Neomycin, Polymyxin B, and Gramicidin (Neosporin[R] Ophthalmic Solution)

Mechanism of Action: Bacitracin-Inhibits bacterial wall synthesis by preventing transfer of mucopeptides into the growing cell wall.

Polymyxin B-Binds to phospholipids, alters permeability, and damages the bacterial cytoplasmic membrane permitting leakage of intracellular constituents.

Neomycin and gramicidin-interferes with bacterial protein synthesis.

Indications: Treatment of superficial ocular infections. Treatment or prevention of infection in minor cuts, scrapes, and burns.

Adverse Reactions and Side Effects:

Dermatologic: Urticaria, rash, allergic contact dermatitis

Ocular: conjunctivitis, burning

Drug Interactions: None

Nitrofurantoin (Furadantin[R], Macrobid[R], Macrodantin[R])

Mechanism of Action: Interferes with bacterial enzymes.

Indications: Urinary tract infections caused by susceptible organisms. Chronic Suppressive therapy of urinary tract infections.

Adverse Reactions and Side Effects:

CNS: Dizziness, drowsiness, headache

Respiratory: Pneumonitis

CV: Chest pain

GI: Pseudomembranous colitis, anorexia, nausea, vomiting, diarrhea, abdominal pain, hepatitis

Miscellaneous: Hypersensitivity reactions

GU: Discoloration of urine

Dermatologic: Photosensitivity

Hematologic: Blood dyscrasias, hemolytic anemia

HEENT: Nystagmus

Neurologic: Peripheral neuropathy

Drug Interactions: Antacids may decrease absorption. Increased risk of neurotoxicity with neurotoxic drugs. Increased risk of hepatotoxicity with hepatotoxic drugs. Increased risk of pneumonitis with drugs having pulmonary toxicity.

Mupirocin (Bactroban^{R}, Bactroban^{R} Nasal)

Mechanism of Action: Binds to bacterial isoleucyl transfer-RNA synthetase resulting in the inhibition of protein and RNA synthesis.

Indications: Topical treatment or prevention of infections due to *Staphylococcus aureus*,

beta-hemolytic *Streptococcus*, and *Streptococcus pyogenes*.

Adverse Reactions and Side Effects:

Dermatologic: Pruritis, rash, erythema, dry skin

Local: Burning, stinging, tenderness, edema, pain

Drug Interactions: None

Antibiotics, Penicillins

Amoxicillin (Amoxil^{R}, Polymox^{R}, Trimox^{R}, Wymox^{R})

Amoxicillin and clavulanate potassium (Augmentin^{R})

Ampicillin (Omnipen^{R}, Polycillin^{R}, Amcill^{R}, Principen^{R}, Totacillin^{R})

Oxacillin (Bactocill^{R}, Prostaphlin^{R})

Penicillin V Potassium (Beepen-VK^{R}, Betapen^{R}-VK, Pen Vee^{R} K, Veetids^{R})

Mechanism of Action: Binds to bacterial cell wall, resulting in cell death.

Indications: Treatment of the following infections: skin and skin structure, soft tissue, otitis media, sinusitis, respiratory tract, genitourinary, endocarditis prophylaxis.

Adverse Reactions and Side Effects:

CNS: Seizures

GI: Pseudomembranous colitis, diarrhea, nausea, vomiting

Miscellaneous: Allergic reactions including anaphylaxis and serum sickness, superinfection

Dermatologic: Rash, urticaria

Hematologic: Blood dyscrasias

Drug Interactions: Large doses may increase the risk of bleeding with warfarin. May

decrease the effectiveness of oral contraceptives.

Antibiotics, Quinolones

Ciprofloxacin (Ciloxan™ Ophthalmic, Cipro™)

Grepafloxacin (Raxar®)

Gatifloxacin (Tequin®)

Levofloxacin (Levaquin™)

Moxifloxacin (Avelox®)

Lomefloxacin (Maxaquin®)

Ofloxacin (Floxin®, Ocuflox™)

Sparfloxacin (Zagam®)

Mechanism of Action: Inhibits bacterial DNA synthesis by inhibiting DNA gyrase.

Indications: PO-Treatment of urinary tract infections and gynecologic infections. Treatment of respiratory tract infections including sinusitis and community-acquired pneumonia caused by penicillin-resistant strains of *Streptococcus pneumonia*. Ophthalmic-Treatment of bacterial conjunctivitis caused by suspectible organisms and corneal ulcers.

Adverse Reactions and Side Effects:

CNS: Seizures, dizziness, acute psychoses, agitation, confusion, hallucinations, light-headedness, tremors

GI: Pseudomembranous colitis, abdominal pain, nausea, diarrhea

Miscellaneous: Hypersensitivity reactions including anaphylaxis and Stevens-Johnson syndrome

GU: Interstitial nephritis, vaginitis

Dermatologic: Photesensitivity, rash

Musculoskeletal: Tendinitis, tendon rupture

Ocular: Superinfection, photophobia, tearing, dry eyes, stinging

Drug Interactions: The quinolones may increase serum theophylline levels and toxicity. Administration with antacids, iron salts, bismuth subsalicylate, sucralfate, and zinc salts decreases absorption of the quinolones. Concurrent use with warfarin may increase the risk of bleeding.

Antibiotics, Sulfonamide Derivatives

Sulfamethoxazole and trimethoprim (Co-Trimoxazole^{R}, Bactrim^{TM}, Bactrim^{TM} DS, Cotrim^{R}, Cotrim^{R} DS, Septra^{R}, Septra^{R} DS, Sulfatrim^{R})

Sulfacetamide sodium (Bleph^{R}-10 Ophthalmic, Sodium Sulamyd^{R} Ophthalmic)

Mechanism of Action: Interferes with bacterial folic acid synthesis.

Indication: PO-Treatment of urinary tract infections, nocardiosis, toxoplasmosis, and malaria. Ophthalmic-Treatment and prophylaxis of conjunctivitis due to susceptible organisms. Treatment of corneal ulcers. Topical-Treatment of scaling dermatitis and bacterial infections of the skin.

Adverse Reactions and Side Effects:

CNS: Ataxia, confusion, dizziness, mental depression

GI: Nausea, vomiting, diarrhea, hepatitis

Miscellaneous: Hypersensitivity reactions including Stevens-Johnson syndrome and serum sickness, fever, superinfection

GU: Crystalluria

Dermatologic: Rash, exfoliative dermatitis, photosensitivity

Hematologic: Agranulocytosis, aplastic anemia, eosinophilia

Neurologic: Peripheral neuropathy

Ocular: Ophthalmic-Blurred vision, burning

Drug Interactions: May enhance the action of and risk of toxicity from oral hypoglycemic agents, phenytoin, methotrexate, warfarin, or zidovudine. Increased risk of hepatitis when used concurrently with other hepatotoxic drugs.

Antibiotics, Tetracyclines

Doxycycline (Bio-Tab^{R} Oral, Vibramycin^{R} Oral, Vibra-Tabs^{R})

Minocycline (Dynacin^{R} Oral, Monocin^{R} Oral, Vectrin^{R})

Oxytetracycline (Terramycin^{R} Oral)

Tetracycline (Achromycin^{R} Ophthalmic, Sumycin^{R} Oral, Topicycline^{R} Topical)

Mechanism of Action: Inhibits bacterial protein synthesis.

Indications: PO-Treatment of various infections due to unusual organisms, including: *Mycoplasma*, *Chlamydia*, *Rickettsia*, and *Borrelia burgorferi*. Treatment of gonorrhea and syphilis in penicillin-allergic patients. Prevention of exacerbations of chronic bronchitis. Treatment of acne.

Ophthalmic-Treatment of bacterial conjunctivitis.

Adverse Reactions and Side Effects:

CNS: Benign intracranial hypertension, dizziness

GI: Diarrhea, nausea, vomiting, esophagitis, hepatotoxicity, pancreatitis

Miscellaneous: Hypersensitivity reactions, superinfection

Dermatologic: Photosensitivity, rash, pigmentation of skin and mucus membranes

Hematologic: Blood dyscrasias

HEENT: Vestibular reactions

Drug Interactions: May enhance the effects of warfarin and increase the risk of bleeding. May decrease the effectiveness of oral contraceptives. Antacids, calcium salts, iron salts, and magnesium salts form insoluble compounds and decrease the absorption of tetracyclines. Sucralfate may bind tetracycline and prevent absorption. Cholestyramine or colestipol decrease absorption of the tetracyclines. Adsorbent antidiarrheals, or activated charcoal decrease absorption of the tetracyclines.

Anticoagulants

Warfarin (Coumadin^{R})

Mechanism of Action: Interferes with the synthesis of vitamin K-dependent clotting factors.

Indications: Prophylaxis and treatment of venous thrombosis, pulmonary embolism, and embolization associated with atrial fibrillation. Management of myocardial infarction to reduce the risk of death, decrease risk of recurrent myocardial infarction, and decrease the risk of future thromboembolic events. Prevention of thrombus formation and embolization after prosthetic valve placement.

Adverse Reactions and Side Effects:

Dermatologic: Dermal necrosis

Hematologic: Bleeding, ecchymosis

Drug Interactions: Abciximab, amiodarone, androgens, cefamandole, cefoperazone, cefotetan, chloral hydrate, chloramphenicol, clopidogrel, disulfiram, fluconazole, fluoroquinolones, itraconazole, metronidazole, plicamycin, thrombolytic agents,

eptifibatide, tirofiban, ticlopidine, sulfonamides, quinidine, quinine, NSAIDs, valproates, and aspirin may increase the response to warfarin and increase the risk of bleeding. Alcohol, barbiturates, phenytoin, oral contraceptives, estrogens, and vitamin K may decrease the response to warfarin.

Anticonvulsants, Barbiturates

Phenobarbital (Barbita[R], Luminal[R], Solfoton[R])

Primidone (Myidone[R], Mysoline[R])

Mechanism of Action: Produces generalized CNS depression, decreases motor activity. Inhibits transmission in the nervous system and raises the seizure threshold.

Indications: Treatment and prevention of tonic-clonic, partial, and febrile seizures.

Adverse Reactions and Side Effects:

CNS: Hangover, delirium, depression, drowsiness, paradoxical excitation, lethargy, vertigo

Respiratory: Respiratory depression

GI: Constipation, diarrhea, nausea, vomiting

Miscellaneous: Hypersensitivity reactions including angioedema and serum sickness. Physical and psychological dependence.

Dermatologic: Photosensitivity, rash, urticaria

Musculoskeletal: Arthralgia, myalgia, neuralgia

Drug Interactions: Additive CNS depression may occur with other CNS depressants (i.e. alcohol, antihistamines, opioids, sedative/hypnotics). May increase the metabolism and decrease the effectiveness of: oral contraceptives, warfarin, chloramphenicol,

cyclosporine, dacarbazine, corticosteroids, tricyclic antidepressants, and quinidine. May increase the risk of hepatotoxicity of acetaminophen. Monoamine oxidase inhibitors and valproate may decrease the metabolism of the barbiturates and increase the risk of toxicity. May increase the risk of hematologic toxicity with cyclophosphamide.

Anticonvulsants, Benzodiazepines

Clonazepam (Klonopin[R])

Diazepam (D-Val[R], Valium[R], Valrelease[R])

Mechanism of Action: Produces sedative effects in the CNS, probably by stimulating inhibitory gamma-animobutyric acid receptors. Anticonvulsant effects may be due to presynapatic inhibition.

Indications: Prophylaxis of petit mal, petit mal variant, akinetic and myoclonic seizures.

Adverse Reactions and Side Effects:

CNS: Behavioral changes, drowsiness, dizziness, confusion, ataxia

Respiratory: Increased secretions, respiratory depression

CV: Palpitations

GI: Constipation, diarrhea, hepatitis

Miscellaneous: Physical or psychological dependence, tolerance

GU: Dysuria, nocturia, urinary retention
HEENT: Double vision, nystagmus

Drug Interactions: Additive CNS depression may occur with other CNS depressants. Cimetidine, oral contraceptives, disulfiram, fluoxetine, isoniazid, ketoconazole, metoprolol, propoxyphene, propranolol, or valproates may decrease the metabolism and increase the risk of adverse effects of the benzodiazepines. Rifampin, phenytoin, or

barbiturates may increase the metabolism and decrease the effectiveness of benzodiazepines. May increase serum phenytoin levels and increase the risk of toxicity.

Anticonvulsants, Hydantoins

Phenytoin (Dilantin^{R})

Mechanism of Action: Limits seizure propagation by altering ion transport. May also decrease synaptic transmission.

Indications: Treatment and/or prevention of tonic-clonic seizures and complex partial seizures.

Adverse Reactions and Side Effects:

CNS: Ataxia, agitation, cerebral edema, coma, dizziness, drowsiness, dyskinesia, extrapyramidal syndrome, headache, nervousness, weakness

CV: Hypotension, tachycardia

GI: Nausea, vomiting, altered taste, anorexia, constipation, hepatitis, dry mouth

Miscellaneous: Allergic reactions including Stevens-Johnson syndrome, fever, lymphadenopathy

GU: Discoloration of urine

Dermatologic: Excessive hair growth, rash, exfoliative dermatitis, pruritis

Hematologic: Agranulocytosis, aplastic anemia, leukopenia, megaloblastic anemia, thrombocytopenia

Fluids and Electrolytes: Hypocalcemia

HEENT: Gingival hyperplasia, double vision, nystagmus, tinnitus

Musculoskeletal: Osteomalacia

Drug Interactions: The following drugs may increase phenytoin blood levels and risk of

toxicity: phenylbutazone, disulfiram, acute alcohol ingestion, amiodarone, isoniazid, chloramphenicol, influenza vaccine, sulfonamides, fluoxetine, benzodiazepines, omeprazole, ketoconazole, fluconazole, miconazole, estrogens, ethosuximide, methylphenidate, phenothiazines, salicylates, oral hypoglycemics, trazodone, felbamate, cimetidine, and NSAIDs. The following drugs may decrease phenytoin levels and decrease effectiveness: Barbiturates, carbamazepine, reserpine, chronic alcohol ingestion, and warfarin. Phenytoin may alter the effects of digoxin, warfarin, felbamate, theophylline, corticosteroids, doxycycline, rifampin, quinidine, methadone, cyclosporine, and estrogens by increasing metabolism and possibly decreasing effectiveness. Additive CNS depression may occur with other CNS depressants (antihistamines, phenothiazines, opioids, sedative/hypnotics, alcohol). Additive cardiac depression may occur with propranolol or lidocaine. Antacids, calcium salts, or sucralfate decreases the absorption of phenytoin.

Anticonvulsants, Miscellaneous

Carbamazepine (Tegretol^{R}, Tegretol^{R}-XR)

Oxcarbazepine (Trileptal^{R})

Mechanism of Action: Decreases synaptic transmission in the CNS by affecting sodium channels in neurons.

Indications: Prevention of tonic-clonic seizures, mixed-and complex-partial seizures. Management of pain in trigeminal neuralgia and other forms of neurogenic pain.

Adverse Reactions and Side Effects:

CNS: Ataxia, drowsiness, fatigue, psychosis, vertigo, syncope

Respiratory: Pneumonitis

CV: CHF, hyper-or hypotension

GI: Hepatitis

GU: Urinary retention

Dermatologic: Photosensitivity, rash, urticaria

Hematologic: Agranulocytosis, aplastic anemia, thrombocytopenia, eosinophilia, Leucopenia

Endocrinologic: Syndrome of inappropriate antidiuretic hormone secretion

HEENT: Blurred vision, corneal opacities

Drug Interactions: Decreases levels and effectiveness of the following drugs: corticosteroids, doxycycline, felbamate, quinidine, warfarin, oral contraceptives, barbiturates, cyclosporine, benzodiazepines, theophylline, lamotrigine, valproic acid, bupropion, and haloperidol. Do not use concurrently or within two weeks of monoamine oxidase inhibitors because of the risk of hyperpyrexia, hypertension, seizures, and death. The following drugs increase levels of carbamazepine and oxcarbazepine and may increase the risk of toxicity: verapamil, diltiazem, propoxyphene, erythromycin, clarithromycin, serotonin selective reuptake inhibitors, or cimetidine. May increase the risk of hepatotoxicity from isoniazid or acetaminophen. May increase the risk of CNS toxicity from lithium.

Ethosuximide (Zarontin^{R})

Mechanism of Action: Elevates the seizure threshold. Suppresses abnormal wave and spike activity associated with absence seizures.

Indications: Preventions of absence and partial myoclonic seizures.

Adverse Reactions and Side Effects:

CNS: Increased frequency of tonic-clonic seizures, dizziness, drowsiness, euphoria, headache, hyperactivity, irritability, psychiatric disturbances, ataxia

GI: Anorexia, abdominal cramping, diarrhea, GI upset, nausea, vomiting, weight loss, hiccups

Miscellaneous: Allergic reactions including Stevens-Johnson syndrome

GU: Discoloration of urine, vaginal bleeding

Dermatologic: Excessive hair growth, rash, urticaria

Hematologic: Aplastic anemia, agranulocytosis, eosinophila, leukopenia

HEENT: Blurred vision

Drug Interactions: Seizure threshold may be lowered by phenothiazines, antidepressants, or monoamine oxidase inhibitors. Additive CNS depression may occur with other CNS depressants (alcohol, antihistamines, phenothiazines, sedative/hypnotics, opioids). Phenytoin may increase metabolism and decrease the effectiveness of ethosuximide.

Gabapentin (Neurontin^{R})

Mechanism of Action: Unknown. May affect transport of amino acids across neuronal membranes.

Indications: Adjunctive treatment of adults with partial seizures with and without secondary generalization. Treatment of chronic pain.

Adverse Reactions and Side Effects:

CNS: Drowsiness, anxiety, dizziness, hostility, malaise, vertigo, weakness, ataxia, altered reflexes, hyperkinesias, paresthesias

CV: Hypertension

GI: Anorexia

HEENT: Gingivitis, abnormal vision, nystagmus, facial edema

Musculoskeletal: Arthralgia

Drug Interactions: Antacids may decrease absorption. Additive CNS depression may occur with CNS depressants (alcohol, antihistamines, antidepressants, sedatives/hypnotics, opioids).

Lamotrigine (Lamictal^{R})

Mechanism of Action: Stabilizes neuronal membranes by inhibiting sodium transport.

Indications: Adjunct treatment of partial seizures in adults. Treatment of adults and children with Lennox-Gastaut syndrome.

Adverse Reactions and Side Effects:

CNS: Ataxia, dizziness, headache, behavior changes, depression, drowsiness, insomnia, tremor

GI: nausea, vomiting

Miscellaneous: Allergic reactions including Stevens-Johnson syndrome

GU: Vaginitis

Dermatologic: Photosensitivity, rash

HEENT: Blurred vision, double vision, rhinitis

Musculoskeletal: Arthralgia

Drug Interactions: Concurrent use with carbamazepine may result in decreased levels of lamotrigine and increased levels of an active metabolite of carbamazepine. Lamotrigine levels and effectiveness are decreased by concurrent use of phenobarbital, phenytoin, or

primidone. Concurrent use with valproic acid results in a twofold increase in lamotrigine levels and a decrease in valproic acid levels.

Topiramate (Topamax^{R})

Mechanism of Action: Blocks sodium channels in neurons. Enhancement of gamma-aminobutyate and prevention of activation of excitatory receptors.

Indications: Adjunctive therapy of partial-onset seizures and primary generalized tonic-clonic seizures.

Adverse Reactions and Side Effects:

CNS: Increased incidence of seizures, dizziness, drowsiness, fatigue, impaired concentration/memory, nervousness, psychomotor slowing, speech problems, aggressive reactions, agitation, anxiety, confusion, depression, malaise, mood changes, ataxia paresthesia, tremor

GI: Nausea, abdominal pain, anorexia, constipation, dry mouth, weight loss

GU: Kidney stones

Hematologic: Leukopenia

HEENT: abnormal vision, double vision, nystagmus

Drug Interactions: Blood levels and effects of topiramate may be decreased by concurrent use of phenytoin, carbamazepine, or valproic acid. Topiramate may increase blood levels and risk of toxicity of phenytoin. Topiramate may decrease blood levels and effectiveness of oral contraceptives or valproic acid. Additive CNS depression may occur with other CNS depressants (alcohol, antihistamines, antidepressants, sedative/hypnotics, opioids).

Levetiracetam (Keppra^{R})

Mechanism of Action: May act in synaptic plasma membranes in the CNS to inhibit burst firing without affecting normal neuronal excitability. May selectively prevent hypersynchronization of epileptiform burst firing and propagation of seizure activity.

Indications: Adjunctive treatment of partial onset seizures in adults.

Adverse Reactions and Side Effects:

CNS: Somnolence, dizziness, depression, nervousness, ataxia, vertigo, amnesia, Anxiety, hostility, paresthesia, emotional lability, psychotic symptoms

Respiratory: Pharyngitis, rhinitis, sinusitis, cough

GI: Abdominal pain, constipation, diarrhea, dyspepsia, nausea, vomiting, anorexia

HEENT: Double vision, gingivitis

Drug Interactions: Additive CNS depression may occur with other CNS depressants (alcohol, opioids, antihistamines, antidepressants, phenothiazines, sedative/hypnotics).

Tigabine (Gabatri^{R})

Mechanism of Action: Enhances the activity of gamma-aminobutyric acid and decreases the frequency of seizures.

Indications: Adjunctive treatment of partial seizures.

Adverse Reactions and Side Effects:

CNS: Dizziness, drowsiness, nervousness, weakness, cognitive impairment, confusion, hallucinations, ataxia, tremors, headache, mental depression, personality disorder, syncope

CV: Chest pain, edema, hypertension, palpitations, tachycardia

GI: Abdominal pain, nausea, stomatitis, weight gain or loss

Miscellaneous: Allergic reactions

GU: Urinary incontinence, dysuria, dysmenorrheal

Dermatologic: Alopecia, dry skin, rash, diaphoresis

HEENT: Gingivitis, epistaxis

Musculoskeletal: Arthralgia

Drug Interactions: Carbamazepine, phenytoin, primidone, or Phenobarbital may decrease blood levels and effectiveness.

Anticonvulsants, Valproates

Divalproex sodium (Depakote^{R})

Valproate sodium (Depacon^{R})

Valproic acid (Depakene^{R})

Mechanism of Action: Increase levels of gamma-aminobutyric acid, and inhibitory neurotransmitter in the CNS.

Indications: Prevention of simple and complex absence seizures and partial seizures with complex symptomology. Divalproex- in addition to above; manic episodes associated with bipolar disorder and prevention of migraine headache.

Adverse Reactions and Side Effects:

CNS: Confusion, dizziness, headache, sedation, ataxia, paresthesia

GI: Hepatotoxicity, nausea, vomiting, indigestion, anorexia, constipation, diarrhea, hypersalivation, increased appetite, pancreatitis

Dermatologic: Rash

Hematologic: Leukopenia, prolonged bleeding time, thrombocytopenia

HEENT: Visual disturbances

Drug Interactions: Decreases the effectiveness of the following drugs: phenytoin, carbamazepine, lamotrigine, clonazepam. Aspirin may increase the effects and toxicity of the valproates and the valproates may increase toxicity of aspirin. Additive CNS depression may occur with other CNS depressants (alcohol, antihistamines, antidepressants, phenothiazines, sedative/hypnotics, opioids).

Antidepressants, Miscellaneous

Bupropion (Wellbutrin^{R}, Zyban^{R})

Mechanism of Action: Decreases neuronal uptake of dopamine, serotonin, and norepinephrine.

Indications: Treatment of depression. Zyban^{R} –to assist with smoking cessation, to decrease cravings.

Adverse Reactions and Side Effects:

CNS: Seizures, agitation, headache, insomnia, mania, psychoses, tremor

GI: Dry mouth, nausea, vomiting, changes in appetite, weight gain or loss

Dermatologic: Photosensitivity

Endocrinologic: Hyper-or hypoglycemia, syndrome of inappropriate antidiuretic hormone secretion

Drug Interactions: Increase risk of adverse effects when used with levodopa or monoamine oxidase inhibitors. Increased risk of seizures with phenothiazines, other antidepressants, theophylline, corticosteroids, CNS stimulants, or cessation of acohol or benzodiazepines.

Lithium (Cibalith-S^{R}, Eskalith^{R}, Eskalith^{R}-CR, Lithane^{R}, Lithonate^{R}, Lithotabs^{R})

Mechanism of Action: Alters reuptake of neurotransmitters and alters cation transport in nerve and muscle.

Indications: Treatment of a variety of psychiatric disorders, particularly bipolar disorders. Used in the treatment of depression associated with bipolar disorders.

Adverse Reactions and Side Effect:

CNS: Seizures, fatigue, headache, impaired memory, ataxia, confusion, dizziness, drowsiness, tremors

CV: Arrhythmias, edema, hypotension

GI: Abdominal pain, anorexia, bloating, diarrhea, nausea, dry mouth

GU: Polyuria, glycosuria, nephrogenic diabetes insipidus, renal toxicity

Dermatologic: Acneiform eruption folliculitis, hair loss, pruritis

Hematologic: Leukocytosis

Endocrinologic: Weight gain, hypo-or hyperthyroidism, goiter, hyperglycemia

Fluids and Electrolytes: Hyponatremia

HEENT: Blurred vision, tinnitus

Musculoskeletal: Muscle weakness, rigidity

Drug Interactions: May prolong the action of neuromuscular blocking agents. Neurologic toxicity may occur with haloperidol or molindone. Diuretics, methyldopa, probenecid, fluoxetine, or NSAIDs may increase the risk of toxicity of lithium. Blood levels and toxicity of lithium may be increased by angiotensin converting enzyme inhibitors. Lithium may decrease the effects of chlorpromazine. Chlorpromazine may mask early signs of lithium toxicity. Hypothyroid effects may be additive with potassium iodide or antithyroid agents. Theophylline, phenothiazines, or drugs containing large amounts of

sodium increase the renal elimination of lithium and may decrease the effectiveness.

Nefazodone (Serzone^{R})

Mechanism of Action: Inhibits the reuptake of serotonin and norepinephrine by neurons. Also antagonizes alpha$_1$-adrenergic receptors.

Indications: Treatment of depression

Adverse Reactions and Side Effects:

CNS: Dizziness, insomnia, somnolence, agitation, confusion, weakness

Respiratory: Dyspnea

CV: Bradycardia, hypotension

GI: Constipation, dry mouth, nausea

GU: Impotence

Dermatologic: Rash

HEENT: Abnormal vision, blurred vision, tinnitus

Drug Interactions: Concurrent use with astemizole or cisapride may result in serious potentially fatal cardiovascular reactions. Serious potentially fatal reactions may occur with concurrent use of monoamine oxidase inhibitors; should not be used within two weeks of each other. Additive CNS depression may occur with other CNS depressants (alcohol, antihistamines, other antidepressants, phenothiazines, opioids, sedative/hypnotics). Additive hypotension may occur with antihypertensive agents, nitrates, or acute alcohol ingestion. May increase the risk of myopathy with HMG-CoA reductase inhibitors.

Trazodone (Desyrel^{R}, Trialodine^{R}, Trazon^{R})

Mechanism of Action: Alters the effects of serotonin in the CNS.

Indications: Treatment of depression. Management of chronic pain syndromes.

Adverse Reactions and Side Effects:

CNS: Drowsiness, confusion, dizziness, fatigue, hallucinations, headache, nightmares, slurred speech, syncope, weakness, tremor

CV: Hypotension, arrhythmias, chest pain, hypertension, palpitations, tachycardia

GI: Dry mouth, altered taste, constipation, diarrhea, excess salivation, nausea, Vomiting

GU: Hematuria, impotence, priapism, urinary frequency

Dermatologic: Rash

HEENT: Blurred vision, tinnitus

Drug Interactions: Serious potentially fatal reactions may occur with concurrent or within two weeks use of monoamine oxidase inhibitors. Additive CNS depression may occur with other CNS depressants (alcohol, antihistamines, phenothiazines, opioids, other antidepressants, sedative/hypnotics).

Antidepressants, Selective Serotonin Reuptake Inhibitors (SSRIs)

Citalopram (Celexa^{R})

Fluoxetine (Prozac^{R}, Sarafem^{R})

Fluvoxamine (Luvox^{R})

Paroxetine (Paxil^{R})

Sertraline (Zoloft^{R})

Venlafaxine (Effexor^{R}, Effexor^{R} XR)

Mechanism of Action: Inhibits neuronal reuptake of serotonin in the CNS, potentiating the activity of serotonin.

Indications: Treatment of depression. Fluoxetine-also treatment of obsessive-compulsive Disorder, bulimia nervosa, anorexia nervosa, attention-deficit hyperactivity disorder, diabetic neuropathy, fibromyalgia, obesity, panic attacks, premenstrual syndrome, and Raynaud's phenomenon. Fluvoxamine-also obsessive-compulsive disorder. Paroxetine-also panic disorder, obsessive-compulsive disorder, and social anxiety disorder. Sertraline- also panic disorder, obsessive-compulsive disorder, and post-traumatic stress disorder. Effexor^{R}-XR- also generalized anxiety disorder.

Adverse Reactions and Side Effects:

CNS: Seizures, abnormal dreams, anxiety, dizziness, headache, nervousness, drowsiness, paresthesia, manic reactions, weakness, insomnia

CV: postural hypotension, palpitations

GI: Anorexia, constipation, diarrhea, nausea, vomiting, dry mouth, weight loss or Gain

GU: Sexual dysfunction, urinary frequency or retention

Dermatologic: Itching, photosensitivity, rash, excessive sweating

HEENT: Rhinitis, visual disturbances

Musculoskeletal: Muscle twitching

Drug Interactions: Serious, potentially fatal reactions (hyperpyrexia, hypertension, seizures, confusion, agitation) may occur with monoamine oxidase inhibitors. Additive CNS depression may occur with other CNS depressants (alcohol, other antidepressants, antihistamines, sedative/hypnotics, phenothiazines, opioids). Concurrent use with

tricyclic antidepressants may increase blood levels and risk of adverse effects of the SSRIs. SSRIs may decrease metabolism and increase effects of beta-adrenergic blockers, diazepam, carbamazepine, lithium, theophylline, oral hypoglycemics, clozapine or warfarin. Blood levels and risk of toxicity of the SSRIs may be increased by ketoconazole, itraconazole, erythromycin, omeprazole, or cimetidine. Serotoninergic effects of the SSRIs may be potentiated by lithium, tramadol or dextromethorphan. Phenobarbital, phenytoin, or rifampin may decrease blood levels and decrease the effectiveness of SSRIs.

Antidepressants, Tricyclics and Tetracyclics (TCAs)

Amitriptyline (Elavil^{R})

Clomipramine (Anafranil^{R})

Doxepin (Adapin^{R} Oral, Sinequan^{R} Oral)

Imipramine (Tofranil^{R}, Tofranil^{R}-PM)

Mirtazapine(Remeron^{R})

Nortriptyline (Aventyl^{R} Hydrochloride, Pamelor^{R})

Protripyline (Vivactil^{R})

Mechanism of Action: Potentiates the effects of serotonin and norepinephrine in the CNS. Possess anticholinergic properties.

Indications: Treatment of depression. Amitriptyline-also treatment of chronic pain. Clomipramine-also treatment of obsessive-compulsive disorder. Doxepine-also treatment of chronic pain, anxiety, and management of puruitis. Imipramine-also treatment of chronic pain, enuresis in children, incontinence in adults, and prevention of vascular and cluster headache. Nortriptyline-also treatment of neurogenic pain.

Adverse Reactions and Side Effects:

CNS: Lethargy, sedation, dizziness, abnormal dreams

CV: Arrhythmias, hypotension

GI: Constipation, hepatitis, increased appetite, weight gain

Dermatologic: Photosensitivity

Hematologic: Blood dyscrasias

Endocrinologic: Gynecomastia

HEENT: Blurred vision, dry eyes, dry mouth

Musculoskeletal: Muscle twitching

Drug Interactions: Serotonin syndrome may occur when used with monoamine oxidase Inhibitors; should not be used within 14 days of each other. Additive CNS depression may occur with other CNS depressants (alcohol, other antidepressants, antihistamines, sedative/hypnotics, opioids, phenothiazines). The following drugs may affect the metabolism and effectiveness of the TCAs: phenothiazines, carbamazepine, antiarrhythmics, cimetidine, amiodarone, ritonavir, rifampin, Phenobarbital, phenytoin. Concurrent use with the SSRI antidepressants may increase the risk of toxicity. Concurrent use with clonidine may result in hypertensive crisis. Additive adrenergic or anticholinergic side effects may be increased when used concurrently with other drugs possessing these properties. Concurrent use with sparfloxacin may increase the risk of cardiovascular adverse effects.

Antifungal Agents

Clotrimazole (Femizole-7^{R}, Gyne-Lotrimin^{R}, Lotrimin^{R}, Lotrimin^{R} AF Cream, Lotrimin^{R} AF

Lotion, Lotrimin[R] AF Solution, Mycelex[R], Mycelex[R]-7, Mycelex[R]-G)

Nystatin (Mycostatin[R], Nilstat[R], Nystex[R])

Fluconazole (Diflucan[R])

Itraconazole (Sporanox[R])

Ketoconazole (Nizoral[R])

Miconazole (Lotrimin[R] AF Powder, Lotrimin[R] AF Spray Liquid, Lotrimin[R] AF Spray Powder, Micatin[R] Topical, Monistat-Derm[TM] Topical, Monistat[TM] Vaginal, M-Zole[R] 7 Dual Pack)

Terconazole (Terazole[R], Terazole[R] 7)

Mechanism of Action: Inhibits enzymes necessary for the integrity of the fungal cell wall.
Indications: Clotrimazole topical-treatment of a variety of cutaneous fungal infections including candidiasis, athlete's foot, jock itch, ringworm, and other tinea infections. Clotrimazole vaginal-treatment of vulvovaginal candidiasis. Clotrimazole oral-treatment of various tinea infections. Fluconazole-treatment of fungal infections caused by susceptible organisms including oropharyngeal or esophageal candidiasis, urinary tract infections, or a single-dose oral treatment of vaginal candidiasis.
Itraconazole-treatment of Histoplasmosis,Blastomycosis, Aspergillosis, onychomycosis of the fingernails or toenails, or oropharyngeal candidiasis.
Adverse Reactions and Side Effects:

CNS: Headache, dizziness, fatigue with po use

GI: Hepatotoxicity, abdominal discomfort, diarrhea, nausea, vomiting with po use

Dermatologic: Exfoliative skin disorders including Stevens-Johnson syndrome, pruritis, rash with po use

HEENT: Tinnitus with po use

Local: Burning, itching, hypersensitivity reactions, redness, stinging with topical use

Drug Interactions: May increase the risk of myopathy with the HMG CoA reductase inhibitors. May increase blood levels and risk of toxicity from the following drugs: warfarin, antiretrovirals, vinca alkaloids, busulfan, diazepam, angiotensin converting enzyme inhibitors, cyclosporine, tacrolimus, methylprednisolone, digoxin, phenytoin, oral hypoglycemics, or quinidine. Absorption of antifungals may be decreased by antacids, histamine H_2 blockers, sucralfate, proton pump inhibitors, or other drugs that increase gastric pH. The following drugs decrease the blood levels and possibly effectiveness of antifungals: phenytoin, phenobarbital, isoniazid, rifampin, rifabutin, or carbamazepine. The following drugs increase blood levels and possible toxicity of antifungals: clarithromycin, erythromycin, ritonavir, indinavir.

Antihistamine, H_1 Blocker

Brompheniramine (Bromphen^R, Chlorphed^R, Cophene-B^R, Dimetane^R Extentabs^R, Nasahist-B^R)

Clorpheniramine (Aller-Chlor^R, Chlor-Pro^R, Chlor-Trimeton^R, Teldrin^R)

Clemastine (Antihist-1®, Tavist®, Tavist®-1)

Dimenhydrinate (Dimetabs® Oral, Dramamine® Oral, Triptone® Caplets®)

Diphenhydramine (Benadryl® Oral, Benadryl® Topical, Benylin® Cough Syrup, Compoz® Gel Caps, Diphen® Cough, Diphenhist®, Genahist® Oral, Sominex® Oral, Tysstat® Syrup, Uni-Bent® Cough Syrup)

Hydroxyzine (Atarax®, Hyzine-50®, Vistacon®, Vistquel®)

Meclizine (Antivert®, Dizmiss®, Dramamine® II, Marezine®, Vergon®)

Olopatadine (Patanol®)

Promethazine (Anergan®, Phenazine®, Phenergan®)

Mechanism of Action: Antagonizes the effects of histamine at H-receptor sites to decrease symptoms of histamine excess, such as sneezing, rhinorrhea, nasal and ocular pruruitis, ocular tearing and redness.

Indications: Relief of allergic symptoms caused by histamine release, including nasal allergies, allergic dermatoses. Management of severe allergic or hypersensitivity reactions. Prevention of motion sickness. Treatment of vertigo. Treatment of insomnia.

Adverse Reactions and Side Effects:

CNS: Drowsiness, dizziness, paradoxical excitation

CV: Hypertension, arrhythmias, hypotension, palpitations

GI: Dry mouth, constipation

GU: Urinary retention, hesitancy

HEENT: Blurred vision

Ocular: Burning, stinging, blurred vision with olopatadine.

Drug Interactions: Additive CNS depression with CNS depressants (alcohol, opioids, sedative/hypnotics, antidepressants, phenothiazines). Monoamine oxidase inhibitors intensify and prolong the anticholinergic effects of antihistamines. Additive anticholinergic effects with antidepressants, atropine, haloperidol, phenothiazines, quinidine, and disopyramide.

Antihistamines, H_1 Blocker and Opioid

Chlorpheniramine and hydrocodone (Tussionex^R)

Mechanism of Action: Antagonizes the effects of histamine at H-receptor sites to decrease symptoms of histamine excess, including: sneezing, rhinorrhea, nasal and ocular pruritis, ocular tearing and redness. Hydrocodone binds to opiate receptors in the CNS to suppress the cough reflex via a direct central action.

Indications: Antitussive. Relief of allergic symptoms caused by histamine release.

Adverse Reactions and Side Effects:

CNS: Drowsiness, dizziness, paradoxical excitation, confusion, dysphoria, euphoria, floating feeling, hallucinations, unusual dreams, headache

Respiratory: Respiratory depression

CV: Hypertension, hypotension, arrhythmias, palpitations, bradycardia

GI: Dry mouth, constipation, nausea, vomiting

Miscellaneous: Physical dependence, psychological dependence, tolerance

GU: Urinary retention or hesitancy

HEENT: Blurred vision, double vision

Drug Interactions: Concurrent use with monoamine oxidase inhibitors may produce severe unpredictable reactions and prolongs the anticholinergic effects. Additive CNS depression may occur with other CNS depressants (alcohol, sedative/hypnotics, antidepressants, phenothiazines). Administration of partial antagonist opioids may preciptitate opioid withdrawal in physically dependent patients. Additive anticholinergic effects may occur with antidepressants, atropine, haloperidol, phenothiazines, quinidine, or disopyramide.

Antihistamines, H_1 Blocker, Nonsedating

Loratadine (Claritin^R, Claritin Reditabs^R)

Cetirizine (Zrytec^R)

Fexofenadine (Allegra^R)

With Decongestant

Loratadine and pseudoephredrine (Claritin-D^R, Claritin-D^R 24 Hour Extended Release)

Fexofenadine and pseudoephedrine (Allegra-D^R)

Mechanism of Action: Antagonizes the effects of histamine at peripheral histamine-1 (H) receptors released during allergic reactions. Also has a drying effect on the nasal mucosa. Results in decreased sneezing, rhinorrhea, itchy eyes, nose, and throat. With decongestant-also directly stimulates alpha-adrenergic receptors of respiratory mucosa causing vasoconstriction to promote nasal or sinus drainage.

Adverse Reactions and Side Effects:

CNS: Drowsiness, fatigue, dizziness. With decongestant-Nervousness, insomnia, headache, tremor

CV: With decongestant-Tachycardia, palpitations, arrhythmias, hypertension

GI: Dyspepsia

Dermatologic: Photosensitivity

HEENT: Dry mouth, pharyngitis

Drug Interactions: Additive CNS depression with other CNS depressants (other antihistamines, alcohol, opioids, sedative/hypnotics, phenothiazines). With decongestant-may decrease effectiveness of antihypertensives. Concurrent use with monoamine oxidase inhibitors may result in hypertensive crisis. Propranolol and sympathomimetics may increase toxicity.

Antihyperglycemic Agents, Alpha-Glucosidase Inhibitors

Miglitol (Glyset^{R})

Acarbose (Precose^{R})

Mechanism of Action: Lower blood sugar by inhibiting the enzyme alpha-glucosidase in the GI tract, resulting in delayed and reduced glucose absorption.

Indications: Management of type 2 diabetes mellitus in conjunction with dietary therapy. May be used with sulfonylurea oral hypoglycemic agents, insulin, or metformin.

Adverse Reactions and Side Effets:

GI: Abdominal pain, diarrhea, flatulence, increased liver function tests

Drug Interactions: The following drugs may increase glucose levels in diabetic patients and cause loss of control of blood sugar: diuretics, corticosteroids, phenothiazines, thyroid agents, estrogens, conjugated progestins, oral contraceptives, phenytoin, niacin, sympathomimetics, calcium channel blockers, or isoniazid. Effects of the alpha-glucosidase inhibitors are decreased by concurrent use of intestinal adsorbents, including

activated charcoal, antidiarrheals, and digestive enzyme preparations. Potentiate the effects of sulfonylurea oral hypoglycemic agents.

Antihyperglycemic Agents, Biguanides

Metformin (Glucophage^{R})

Mechanism of Action: Decreases hepatic production of glucose. Decreases intestinal absorption of glucose. Increases sensitivity to insulin. These actions result in maintenance of blood sugar.

Indications: Adjunctive management of type 2 diabetes mellitus. May be used with diet and/or sulfonylurea oral hypoglycemic agents.

Adverse Reactions and Side Effects:

GI: Abdominal bloating, diarrhea, nausea, vomiting, metallic taste

Endocrinologic: Hypoglycemia

Fluids and Electrolytes: Lactic acidosis

Drug Interactions: Acute or chronic alcohol ingestion or iodinated contrast media increases the risk of lactic acidosis. The following drugs may compete with elimination pathways with metformin and alter responses: amiloride, digoxin, morphine, procainamide, quinidine, $H\text{-}_2$ blockers, trimaterene, trimethoprim, and calcium channel blockers.

Antihyperglycemic Agents, Insulins

Insulin Aspart (Novo Log^{R})

Insulin Glargine (Lantus^{R})

Insulin Lispro (Humalog^{R})

Regular Insulin (Humulin R®, Novolin R®, NovolinR PenFill®, Regular Iletin® I, Regular Pork Iletin® II, Regular Purified Pork Insulin®, Velosulin® Human, Regular (Concentrated) Iletin® II U-500)

Extended Insulin Zinc Suspension (Human U Ultralente®, Novolin U®, Ultralente U®)

Insulin Zinc Suspension (Humulin L®, Lente Iletin® I, Lente Iletin® II, Lente® L, Novolin® L)

Isophane Insulin Suspension, NPH/Regular Insulin Mixture (Humulin® 50/50, Humulin® 70/30, Novolin® 70/30, Novolin® 70/30 PenFill®)

NPH Insulin, Isophane (Humulin® N, NPH Iletin® I, NPH-NR, Novolin® N, Novolin® N PenFill®, Pork NPH Iletin® II)

Prompt Zinc Insulin Suspension (PZI®)

Mechanism of Action: Lowers blood glucose by increasing transport into cells and promoting conversion of glucose to glycogen. Promotes the conversion of amino acids to proteins in muscle and stimulates triglyceride formation. Inhibits the release of free fatty acids.

Indications: Treatment of type1 diabetes mellitus. Management of type 2 diabetes mellitus unresponsive to treatment with diet and/or oral hypoglycemic agents.

Adverse Reactions and Side Effects:

Miscellaneous: Allergic reactions including anaphylaxis

Dermatologic: Urticaria

Local: Lipodystrophy, itching, lipohypertrophy, redness, swelling

Endocrinologic: Hypoglycemia, rebound hyperglycemia

Drug Interactions: Beta-adrenergic blockers may mask signs and symptoms of

hypoglycemia and delay recovery from hypoglycemia. The following drugs may increase insulin requirements: diuretics, corticosteroids, thyroid agents, estrogens, nicotine, protease inhibitor antiretrovirals, rifampin, anabolic steroids, alcohol, monoamine oxidase inhibitors, NSAIDs, oral hypoglycemic agents, or warfarin.

Antihyperglycemic Agents, Nonsulfonylurea

Repaglinide (Prandin^{R})

Nateglinide (Starlix^{R})

Mechanism of Action: Stimulate the release of insulin from pancreatic beta cells by closing potassium channels, which results in the opening of calcium channels in beta cells. This is followed by release of insulin. Results in lowering of blood glucose levels.

Indications: Management of type 2 diabetes mellitus in conjunction with diet and exercise. May be used with metformin.

Adverse Reactions and Side Effects:

CV: Angina, chest pain

Endocrinologic: Hypoglycemia

Drug Interactions: Ketoconazole, miconazole, NSAIDs, sulfonamides, warfarin, monoamine oxidase inhibitors, beta-adrenergic blockers, or erythromycin may increase the risk of hypoglycemia. Corticosteroids, phenothiazines, thyroid agents, estrogens, oral contraceptives, phenytoin, sympathomimetics, isoniazid, or calcium channel blockers may decrease the effectiveness of the nonsulfonylureas and result in hyperglycemia.

Antihyperglycemic Agents, Sulfonylureas

Acetohexamide (Dymelor^{R})

Chlorpropamide (Diabinese^{R})

Glimepiride (Amaryl^{R})

Glipizide (Glucotrol^{R}, Glucotrol^{R} XL)

Glyburide (DiaBeta^{R}, Glynase^{TM} PresTab, Micronase^{R})

Tolazamide (Tolinase^{R})

Tolbutamide (Orinase^{R})

Mechanism of Action: Lower blood sugar by stimulating the release of insulin from the pancreas and increasing the sensitivity to insulin at receptor sites. May also increase hepatic glucose production.

Indications: Controls blood sugar in type 2 diabetes mellitus when diet therapy fails.

Adverse Reactions and Side Effets:

CNS: Dizziness, drowsiness, headache, weakness

GI: Constipation, abdominal cramps, diarrhea, hepatitis, nausea, vomiting

Dermatologic: Photosensitivity, rash

Hematologic: Aplastic anemia, agranulocytosis, leukopenia, pancytopenia, Thrombocytopenia

Endocrinologic: Hypoglycemia

Fluids and Electrolytes: Hyponatremia

Drug Interactions: Ingestion of alcohol may result in disulfiram-like reaction. Effectiveness of sulfonylureas may be decreased by concurrent use of the following drugs: diuretics, corticosteroids, phenothiazines, oral contraceptives, estrogens, thyroid agents, phenytoin, sympathomimetics, or isoniazid. The following drugs may increase the risk of hypoglycemia: alcohol, androgens, clofibrate, monoamine oxidase inhibitors,

NSAIDs, salicylates, sulfonamides, or warfarin. Sulfonylureas may increase the risk of bleeding with warfarin. Beta-adrenergic blockers may alter the response to sulfonylureas.

Antihyperglycemics, Thiazolidinediones

Pioglitazone (Actos^{R})

Rosiglitazone (Avandia^{R})

Mechanism of Action: Improves sensitivity to insulin by acting as an agonist at receptor sites involved in insulin responsiveness and subsequent glucose production and utilization. Requires insulin for activity.

Indications: Used as an adjunct to diet and exercise in the management of type 2 diabetes mellitus. May also be used with metformin when the combination of diet, exercise, and metformin does not achieve glycemic control.

Adverse Reactions and Side Effects:

CV: Edema

Hematologic: Anemia

Metabolic: Increased total cholesterol, LDL, and HDL, weight gain

Drug Interactions: None.

Antilipemic Agents, HMG-CoA Reductase Inhibitors

Atorvastatin (Lipitor^{R})

Fluvastatin (Lescol^{R})

Lovastatin (Mevacor^{R})

Pravastatin (Pravachol^{R})

Simvastatin (Zocor^{R})

Mechanism of Action: Inhibits the enzyme, 3-hydroxy-3-methylglutaryl-coenzyme A (HMG-CoA) reductase, which is responsible for catalyzing an early step in the synthesis of cholesterol. Results in a decrease of total and LDL cholesterol. Slightly increases HDL and decreases VLDL cholesterol and triglycerides. Reduces the risk of myocardial infarction and cerebrovascular accident. Slows progression of coronary artery disease.

Indications: Adjunct to dietary therapy in the management of primary Hypercholesterolemia and mixed dyslipidemias, including hypertriglyceridemia.

Adverse Reactions and Side Effects:

CNS: Dizziness, headache, insomnia, weakness

Respiratory: Bronchitis

CV: Chest pain, peripheral edema

GI: Abdominal cramps, constipation, diarrhea, flatulence, hepatitis, dyspepsia, elevated liver function tests, nausea, pancreatitis

Miscellaneous: Hypersensitivity reactions including angioneurotic edema

GU: Impotence

Dermatologic: Rash

Musculoskeletal: Rhabdomyolysis, myalgia, myositis

Drug Interactions: Cholesterol-lowering effect may be additive with bile acid sequestrants. Absorption may be decreased by bile acid sequestrants. Risk of myopathy is increased by concurrent cyclosporine, gemfibrozil, clofibrate, erythromycin, large doses of niacin, or antifungals. May increase risk of bleeding with warfarin. May increase digoxin levels and risk of toxicity.

Antimigraine Agents, Triptans, Serotonin Agonists

Naratriptan (Amerge^{R})

Rizatriptan (Maxalt^{R}, Maxalt^{R}-MLT)

Sumatriptan (Imitrex^{R})

Zolmitriptan (Zomig^{R})

Mechanism of Action: Act as a selective agonist at specific vascular serotonin receptor sites, causing vasoconstriction in large intracranial arteries. This results in relief of acute attacks of migraine.

Indications: Acute treatment of migraine attacks and cluster headache episodes.

Adverse Reactions and Side Effects:

CNS: Dizziness, vertigo, anxiety, drowsiness, fatigue, feeling of heaviness or tightness, tight feeling in head, weakness, strange feeling, numbness

CV: Myocardial infarction, angina, chest pressure, chest tightness, coronary vasospasm, ECG changes, transient hypertension

GI: Abdominal discomfort, dysphagia

Dermatologic: Tingling, warm and burning sensation, cool sensation, flushing

Local: Injection site reaction with SC

HEENT: alterations in vision, nasal sinus discomfort, throat discomfort

Musculoskeletal: Jaw discomfort, muscle cramps, myalgia, neck pain and stiffness

Drug Interactions: The risk of vasospastic reactions may be increased by concurrent use of ergotamine. Serotonin syndrome may occur with concurrent use of lithium,

monoamine oxidase inhibitors, or SSRI antidepressants.

Antiplatelet Agents

Aspirin and dipyridamole extended release (Aggrenox^{R})

Dipyridamole (Persantine^{R})

Mechnism of Action: Dipyridamole decreases platelet aggregation by inhibiting the enzyme phosphodiesterase. Aspirin blocks prostaglandin synthetase action which prevents formation of the platelet-aggregating substance thromboxane A_2.

Indications: Dipyridamole prevents thromboembolism in combination with warfarin in patients with prosthetic heart valves. Dipyridamole and aspirin maintains patency after surgical grafting procedures.

Adverse Reactions and Side Effets:

CNS: Dizziness, headache, syncope

GI: Nausea, diarrhea, GI upset, vomiting

Miscellaneous: Allergic reactions

Dermatologic: Rash

Drug Interactions: Risk of bleeding may be increased when used with anticoagulants, thrombolytic agents, NSAIDs, cephalosporins, sulfonamides, sulfonylureas, or valproic acid. Increased risk of hypotension with alcohol ingestion.

Cilostazol (Pletal^{R})

Mechanism of Action: Decreases platelet aggregation by inhibiting the enzyme phosphodiesterase.

Indications: Reduces symptoms of intermittent claudication.

Adverse Reactions and Side Effects:

CNS: Headache, dizziness

CV: Palpitations, tachycardia

GI: Diarrhea

Drug Interactions: The following drugs may decrease the metabolism of cilostazol and increase levels and effects: antifungals, SSRI antidepressants, nefazodone, or proton pump inhibitors.

Clopidogrel (Plavix^{R})

Mechanism of Action: Inhibits platelet aggregation by irreversibly inhibiting the binding of adenosine triphosphate to platelet receptors.

Indications: Reduction of myocardial infarction, cerebrovascular accident, or vascular death in patients at risk for atherosclerotic events.

Adverse Reactions and Side Effects:

CNS: Depression, dizziness, fatigue, headache

Respiratory: Cough, dyspnea

CV: Chest pain, edema, hypertension

GI: GI bleeding, abdominal pain, diarrhea, dyspepsia, gastritis

Dermatologic: Pruritis, purpura, rash

Hematologic: Bleeding, neutropenia

Endocrinologic: Hypercholesterolemia

Drug Interactions: Concurrent use of the following drugs may increase the risk of bleeding: abciximab, eptifibatide, aspirin, NSAIDs, ticlopidine, thrombolytic agents, or

anticoagulants. Clopidogrel may inhibit the metabolism and increase the effects of phenytoin, sulfonylureas, tamoxifen, warfarin, torsemide, fluvastatin, or NSAIDs.

Ticlopidine (Ticlid^{R})

Mechanism of Action: Inhibits platelet aggregation by altering the function of platelet membranes. Prolongs bleeding time.

Indications: Prevention of cerebrovascular accident in patients who have had an ischemic stroke or transient ischemic attacks and are unable to tolerate aspirin. Prevention of early restenosis in intracoronary events.

Adverse Reactions and Side Effects:

CNS: Dizziness, headache, weakness, intracerebral bleeding

GI: Diarrhea, elevated liver function tests, anorexia, GI pain, nausea, vomiting

GU: Hematuria

Dermatologic: Rash, ecchymoses, pruritis, urticaria

Hematologic: Agranulocytosis, neutropenia, bleeding, thrombocytopenia

Endocrinologic: Hypercholesterolemia, hypertriglyceridemia

HEENT: Epistaxis, tinnitus

Drug Interactions: Aspirin potentiates the effets on platelets. Increased risk of bleeding may occur with concurrent use of the following drugs: anticoagulants, tirofiban, eptifibatide, clopidogrel, thrombolytic agents, or cimetidine. Ticlopidine decreases the metabolism of theophylline and may increase the risk of toxicity.

Antipsychotic Agents, Atypical

Risperidone (Risperdal^{R})

Mechanism of Action: Blocks dopamine and serotonin receptors in the CNS to decrease symptoms of psychoses.

Indications: Management of psyhosis.

Adverse Reactions and Side Effects:

CNS: Neuroleptic malignant syndrome, aggressive behavior, dizziness, extrapyramidal syndrome, headache, increased dreams, increased sleep duration, insomnia, sedation, fatigue, impaired temperature regulation.

CV: Arrythmias, orthostatic hypotension, tachycardia

GI: Constipation, diarrhea, nausea, abdominal pain, anorexia, dyspepsia, vomiting

Miscellaneous: Weight gain or loss, polydipsia

GU: Decrease libido, dysmenorrheal, menorrhagia, difficulty urinating, polyuria

Dermatologic: Itching, rash, dry skin, diaphoresis, photosensitivity

Endocrinologic: Galactorrhea

HEENT: Dry mouth, visual disturbances, pharyngitis, rhinitis

Drug Interactions: May decrease the effectiveness of dopamine agonitsts. Additive CNS depression may occur with other CNS depressants. Clozapine decreases the metabolism and increases effects. Carbamazepine increases the metabolism and may decrease the effects.

Antipsychotics, Butyrophenones

Haloperidol (Haldol^{R})

Mechanism of Action: Blocks dopamine receptors. Possesses anticholinergic and alpha-adrenergic blocking activity. Decreases signs and symptoms of psychoses. Improves behavior in children with Tourette's syndrome or other behavioral problems.

Indications: Acute and chronic psychoses. Tourette's syndrome and severe behavioral problems in children. Treatment of nausea and vomiting from cancer chemotherapy.

Adverse Reactions and Side Effects:

CNS: Neuroleptic malignant syndrome, seizures, extrapyramidal symptoms, confusion, drowsiness, restlessness, tardive dyskinesias

Respiratory: Respiratory depression

CV: Hypotension, tachycardia

GI: Constipation, anorexia, hepatitis

Miscellaneous: Allergic reactions
GU: Urinary retention

Dermatologic: Photosensitivity, rash

Hematologic: Anemia, leukopenia

Endocrinologic: Galactorrhea

HEENT: Dry mouth, blurred vision, dry eyes

Drug Interactions: Additive hypotension may occur with antihypertensives, nitrates, or acute alcohol ingestion. Additive anticholinergic effects occur with phenothiazines, antihistamines, tricyclic antidepressants, atropine, or disopyramide. Additive CNS depressant effects occur with other CNS depressants (alcohol, antihistamines, antidepressants, phenothiazines, opioids, sedative/hypnotics). Concurrent use with epinephrine may result in severe hypertension and tachycardia. Decreases the effects of dopamine agonists (levodopa, pramipexole, pergolide).

Antipsychotics, Miscellaneous

Clozapine (Clozaril^{R})

Mechanism of Action: Blocks dopaminergic receptors in the CNS. Also has anti-cholinergic and alpha-adrenergic blocking activity. Results in diminished schizophrenic behavior.

Indications: Treatment of schizophrenic patients unresponsive to or intolerant of standard antipsychotic therapy.

Adverse Reactions and Side Effects:

CNS: Neuroleptic malignant syndrome, seizures, dizziness, sedation, extrapyramidal reactions

CV: Hypotension, tachycardia, ECG changes

GI: Constipation, abdominal discomfort, nausea, vomiting

Miscellaneous: Fever, weight gain

GU: Urinary retention

Dermatologic: Rash, diaphoresis

Hematologic: Agranulocytosis, leukopenia

Endocrinologic: Hyperglycemia

HEENT: Visual disturbances, dry mouth

Drug Interactions: Additive anticholinergic effects occur with antihistamines, quinidine, phenothiazines, disopyramide, or antidepressants. Concurrent use with SSRI antidepressants increase blood levels of clozapine and risk of toxicity. Additive CNS depression may occur with alcohol, antidepressants, antihistamines, opioids, or sedative/hypnotics. Additive hypotension may occur with antihypertensives, nitrates, or acute alcohol ingestion. Increased risk of bone marrow suppression with

antihypertensives or radiation therapy. Use with lithium may increase the risk of adverse CNS reactions.

Quetiapine (Seroquel^{R})

Mechanism of Action: Blocks dopaminergic and serotoninergic receptors in the CNS. Also antagonizes histamine H_1 receptors and alpha$_1$-adrenergic receptors. Results in decreased manifestations of psychoses.

Indications: Management of symptoms of psychotic disorders.

Adverse Reactions and Side Effects:

CNS: Neuroleptic malignant syndrome, seizures, dizziness, cognitive impairment, extrapyramidal symptoms, sedation, tardive dyskinesias

Respiratory: Cough, dyspnea, pharyngitis

CV: Palpitations, peripheral edema, postural hypotension

GI: Anorexia, constipation, dyspepsia

Miscellaneous: Flu-like syndrome

GU: Urinary retention

Dermatologic: Diaphoresis

Hematologic: Leukopenia

HEENT: Dry mouth, rhinitis

Metabolic: Weight gain

Drug Interactions: Additive CNS depression may occur with other CNS depressants (alcohol, antihistamine, phenothiazines, antidepressants, sedative/hypnotics, opioids). Increased risk of hypotension with acute alcohol ingestion, nitrates, or antihypertensives. The following drugs increase the metabolism and may decrease the effectiveness of

quetiapine: phenytoin, thioridazine, carbamazepine, barbiturates, rifampin, or corticosteroids. The following drugs may decrease the metabolism and increase the risk of toxicity from quetiapine: ketoconazole, itraconazole, fluconazole, or erythromycin.

Antipsychotics, Phenothiazines

Chlorpromazine (Thorazine[R])

Fluphenazine (Prolixin[R])

Mesoridazine (Serentil[R])

Perphenazine (Trilafon[R])

Prochlorperazine (Compazine[R])

Promazine (Sparine[R])

Thioridazine (Mellaril[R], Mellaril[R]-S)

Thiothixene (Navane[R])

Trifluoperazine (Stelazine[R])

Mechanism of Action: Block dopaminergic receptors in the CNS. Possess significant anticholinergic and alpha-adrenergic blocking activity. Results in diminished signs and symptoms of psychosis. Depresses the chemoreceptor trigger zone in the CNS to relieve nausea and vomiting.

Indications: Acute and chronic psychoses, Chlorpromazine and perphenazine-also to relieve nausea and vomiting, treatment of intractable hiccups, treatment of acute intermittent prophyria, and treatment of vascular headaches. Trifluoperazine-also to treat anxiety disorder. Thioridazine-also management of depression and anxiety in geriatric patients, or severe behavioral problems in children. Prochlorperazine-also for the treatment of nausea and vomiting, or treatment of anxiety.

Adverse Reactions and Side Effects:

CNS: Neuroleptic malignant syndrome, sedation, extrapyramidal reactions, tardive dyskinesias

CV: Hypotension, tachycardia

GI: Constipation, dry mouth, anorexia, hepatitis

Miscellaneous: Allergic reactions

GU: Urinary retention

Dermatologic: Photosensitivity, rash

Hematologic: Agranulocytosis, leukopenia

Endocrinologic: Galactorrhea

HEENT: Blurred vision, dry eyes

Drug Interactions: Concurrent use with pimozide increases the risk of potentially serious cardiovascular reactions. May alter serum phenyoin levels. Decreases pressor effects of catecholamines. May decrease elimination and increase risk of toxicity from valproic acid. May decrease the effects of amphetamines. Decreases the effectiveness of dopamine agonists (pergolide, levodopa, pramipexole). May increase blood levels and risk of toxicity from tricyclic antidepressants. Increased risk of anticholinergic effects with antihistamines, tricyclic antidepressants, quinidine, disopyramide. Phenytoin, rifampin, barbiturates increase the metabolism of the phenothiazines and may decrease the effectiveness. Additive hypotension may occur with antihypertensives, nitrates, or acute alcohol ingestion. Additive CNS depression may occur with alcohol, antidepressants, antihistamines, monoamine oxidase inhibitors, opioids, sedative/hypnotics, or general anesthetics. Concurrent use with lithium may produce disorientation, unconsciousness, or extrapyramidal symptoms. Concurrent use with meperidine may produce excessive sedation and hypotension. Concurrent use with beta-adrenergic blockers increases blood levels and potential toxicity of both.

Antipsychotics, Thienobenzodiazepines

Olanzapine (Zyprexa™)

Mechanism of Action: Antagonizes dopamine and serotonin receptors in the CNS. Has anticholinergic, antihistaminic, and anti-alpha$_1$-adrenergic effects. Decreases the manifestations of psychoses.

Indications: Management of psychotic disorders.

Adverse Reactions and Side Effects:

CNS: Neuroleptic malignant syndrome, seizures, agitation, dizziness, headache, restlessness, sedation, weakness, dystonia, insomnia, mood changes, personality disorders, speech impairment, tardive dyskinesias, tremor

Respiratory: Cough, dyspnea

CV: Orthostatic hypotension, tachycardia, chest pain

GI: Constipation, abdominal pain, increased appetite, nausea

Miscellaneous: Fever, flu-like syndrome

GU: Decreased libido, urinary incontinence

Dermatologic: Photosensitivity

Endocrinologic: Diabetes mellitus, goiter

Fluids and Electrolytes: Increased thirst

HEENT: Dry mouth, amblyopia, rhinitis, pharyngitis

Musculoskeletal: Hypertonia, joint pain

Drug Interactions: Effects may be decreased by concurrent use of carbamazepine, proton pump inhibitors, rifampin, barbiturates, or phenytoin. Additive hypotension may occur with antihypertensives, nitrates, or acute alcohol ingestion. Additive CNS depression may

occur with phenothiazines, antihistamines, sedative/hypnotics, antidepressants, or opioids. Antagonizes the effects of dopamine agonists (levodopa, pergolide, pramipexole, or bromocriptine).

Antiviral Agents

Acyclovir (Zovirax^{R})

Valacyclovir (Valtrex^{R})

Mechanism of Action: Interferes with viral DNA synthesis. Inhibits viral replicaton and viral shedding and decreases the time to healing of lesions.

Indications: Treatment of herpes zoster in immunocompetent patients. Initial treatment and suppression of recurrent genital herpes in patients who are immunocompetent.

Adverse Reactions and Side Effects:

CNS: Headache, dizziness, weakness

GI: Nausea, diarrhea, abdominal pain, anorexia, constipation

Drug Interactions: Concurrent use of nephrotoxic drugs increases the risk of adverse renal effects. Zidovudine may increase the risk of CNS side effects.

Beta$_2$-Adrenergic Agonists

Albuterol (Proventil^{R}, Proventil^{R} HFA, Ventolin^{R}, Ventolin^{R} Rotacaps^{R})
Metaproterenol (Alupent^{R}, Dey-Dose^{R} Metaproterenol, Metaprel^{R})

Ritodrine (Yutopar^{R})

Salmetrol (Serevent^{R})

Terbutaline (Brethaire^{R}, Brethine^{R}, Bricanyl^{R})

Mechanism of Action: Bind to beta$_2$-adrenergic receptors in airway smooth muscle

leading to activation of adenylcyclase and increases levels of cyclic-3',5'-adenosine monophosphate (cAMP). Increases in cAMP activate kinases, which inhibit the phosphorylation of myosin and decreases intracellular calcium resulting in relaxation of smooth muscle in airways and bronchodilation. Ritodrine/terbutaline- stimulate $beta_2$-adrenergic receptors in the uterus, resulting in uterine relaxation and the intensity and frequency of premature uterine contractions.

Indications:Management of reversible airway disease due to asthma or COPD. Ritodrine/terbutaline-Prevention and treatment of premature labor in pregnancy of greater than 20 weeks duration.

Adverse Reactions and Side Effects:

CNS: Nervousness, restlessness, tremor, headache, insomnia

CV: Chest pain, palpitations, angina, arrhythmias, hypertension, tachycardia

GI: Nausea, vomiting

Endocrinologic: Hyperglycemia

Fluids and Electrolytes: Hypokalemia

Drug Interactions:Corticosteroids may increase the risk of hyperglycemia or fluid retention. Additive adrenergic effects may occur with sympathomimetics or other adrenergic agents. Beta-adrenergic blockers may antagonize the effects. Use with monoamine oxidase inhibitors may lead to hypertensive crisis. Risk of hypokalemia may be increased by concurrent use of diuretics. Hypokalemia increases the risk of digoxin toxicity.

Beta-Adrenergic Blockers

Acebutolol (Sectral^R) Metoprolol (Lopressor^R, Toprol^R XL)

Atenolol (Tenormin®)

Betaxolol (Betoptic®, Betoptic® S, Kerlone®)

Bisoprolol (Zebeta®)

Carteolol (Cartrol®, Ocupress®)

Carvedilol (Coreg®)

Labetolol (Normodyne®, Trandate®)

Levobunolol (AK Beta®, Betagan®)

Metipranolol (OptiPranolol®)

Nadolol (Corgard®)

Penbutolol (Levatol®)

Pindolol (Visken®)

Propranolol (Betachron® E-R, Inderal®, Inderal® LA)

Sotalol (Betapace®)

Timolol (Blocadren® Oral, Timoptic® Ophthalmic)

Mechanism of Action: Block stimulation of $beta_1$(myocardial) and $beta_2$ (pulmonary, vascular, and uterine)-adrenergic receptor sites. Decreases heart rate and blood pressure. Carvedilol-also has $alpha_1$-adrenergic blocking activity which may result in orthostatic hypotension. Ophthalmic-reduces intraocular pressure by reducing aqueous humor production or outflow. Indications: Management of hypertension. Management of mild to moderate CHF in combination with digoxin, diuretics, and angiotensin converting enzyme inhibitors. Management of angina pectoris. Management of arrhythmias. Prevention and management of myocardial infarction. Prevention of migraine headaches. Management of thyrotoxicosis. Management of pheochromocytoma. Treatment of essential tremors. Ophthalmic-Treatment of glaucoma.

Adverse Reactions and Side Effects:

CNS: Dizziness, fatigue, weakness, anxiety, depression, drowsiness, insomnia, memory loss, nightmares, parasthesias

Respiratory: Bronchospasm, wheezing

CV: Bradycardia, CHF, pulmonary edema, orthostatic hypotension, peripheral vasoconstriction

GI: Diarrhea, nausea

Miscellaneous: Drug-induced lupus syndrome

GU: Impotence, decreased libido

Dermatologic: Itching, rash

Endocrinologic: Hyperglycemia

Ocular: Ophthalmic use-burning, stinging

Drug Interactions: May alter effectiveness of insulin or oral hypoglycemics. May decrease effectiveness of beta-adrenergic bronchodilators or theophylline. May decrease the beneficial beta cardiovascular effects of dopamine or dobutamine. Hypertension may occur with concurrent use of monoamine oxidase inhibitors. NSAIDs or corticosteroids may decrese the antihypertensive effects. Additive hypotension may occur with other antihypertensives, acute alcohol ingestion, or nitrates. Concurrent use with CNS stimulants (cocaine, amphetamines, ephedrine, epinephrine, norepinephrine, phenylephrine, or pseudoephedrine) may result in unopposed alpha-adrenergic stimulation and excessive hypertension and bradycardia.Thyroid agents, antihistamines, or anticholinergic agents may decrease the effectives of beta-adrenergic blockers. Phenytoin or verapamil may cause additive myocardial depression. Additive bradycardia may occur with digoxin.

Bisphosphonates

Alendronate (Fosamax^{R})

Etidronate disodium (Didronel^{R})

Risedronate (Actonel^{R})

Mechanism of Action: Inhibit the resorption of bone by inhibiting osteoclast activity. Reverses the progression of osteoporosis with decreased fractures and decreases progression of Paget's disease.

Indications: Treatment and prevention of osteoporosis in postmenopausal women. Treatment of Paget's disease of the bone. Treatment of corticosteroid-induced osteoporosis in patients who are receiving greater than 7.5 mg of prednisone daily or its equivalent and have evidence of decreased bone mineral density.

Adverse Reactions and Side Effects:

CNS: Headache

GI: Abdominal distention and pain, acid regurgitation, constipation, diarrhea, dyspepsia, dysphagia, esophageal ulcer, flatulence, gastritis, nausea, vomiting

Dermatologic: Erythema, photosensitivity, rash

Musculoskeletal: musculoskeletal pain

Drug Interactions: Calcium salts, or antacids decrease the absorption and effectiveness of the bisphosphonates. Increased risk of GI adverse effects when used with NSAIDs.

Bronchodilators, Anticholinergic

Ipratropium (Atrovent^{R})

Mechanism of Action: Inhibits cholinergic receptors in bronchial smooth muscle, resulting in decreased concentrations of cyclic guanosine monophosphate (cGMP). This produces bronchodilation.

Indications: Bronchodilator in maintenance therapy of reversible airway obstruction due to COPD. Adjunctive management of bronchospasm caused by asthma.

Adverse Reactions and Side Effects:

CNS: Dizziness, headache, nervousness

Respiratory: Bronchospasm, cough

CV: Hypotension, palpitations

GI: GI irritation, nausea

Miscellaneous: Allergic reactions

Dermatologic: Rash

HEENT: Blurred vision, sore throat, dry mouth

Drug Interactions: Potential fluorocarbon toxicity when used with other inhalation Bronchodilators having a fluorocarbon propellant. Additive anticholinergic effects with antihistamines, phenothiazines, disopyramide, or tricyclic antidepressants.

Bronchodilators, Anticholinergic and Beta-Adrenergic Agonist

Ipratropium and albuterol (Combivent^{R})

See bronchodilators, anticholinergic agents and beta$_2$-adrenergic agonists.

Bronchodilators, Beta$_2$-Adrenergic Agonists

See beta$_2$-adrenergic agonists.

Bronchodilators, Leukotriene Receptor Antagonists

Montelukast (Singulair^{R})

Zafirlukast (Accolate^{R})

Mechanism of Action: Antagonize the effects of leukotrienes, which mediate the following: airway edema, smooth muscle constriction, altered cellular activity. Results in decreased inflammation and decreased frequency and severity of acute asthma attacks.

Indications: Long-term management of asthma.

Adverse Reactions and Side Effects:

CNS: Fatigue, headache, weakness

Respiratory: Cough

GI: Abdominal pain, diarrhea, dyspepsia, nausea, elevated liver function tests

Miscellaneous: Eosinophilia, fever

Dermatologic: Rash

HEENT: Nasal congestion, otitis, sinusitis

Drug Interactions: Blood levels and risk of toxicity increased by aspirin, erythromycin, or theophylline. Increased risk of bleeding with warfarin.

Bronchodilators, Phosphodiesterase Inhibitors, Xathines

Theophylline (Elixophyllin^{R}, Quibron^{R}-T, Respbid^{R}, Slo-Phyllin^{R}, Theochron^{R}, Theoclar^{R}, Theo-Dur^{R}, Theolair^{R}, Theo-24R, Uniphyl^{R})

Mechanism of Action: Inhibits phosphodiesterase producing increased tissue concentrations of cyclic adenosine monophosphate (cAMP). This results in: bronchodilation, CNS stimulation, positive inotropic and chronotropic effects, diuresis, gastric acid secretion.

Indications: Used as a bronchodilator in long-term control of reversible airway obstruction caused by asthma or COPD. Stimulant in apnea of infancy.

Adverse Effects and Side Effects:

CNS: Seizures, anxiety, headache, insomnia, tremor

CV: Arrythmias, tachycardia, angina, palpitations

GI: Nausea, vomiting, anorexia, abdominal cramps

Drug Interactions: Additive cardiovascular and CNS side effects with sympathomimetic

agents. May decrease the therapeutic effect of lithium. The following drugs may increase the metabolism and decrease the effectiveness of theophylline: nicotine, adrenergic agents, barbiturates, phenytoin, ketoconazole, or rifampin. The following drugs may decrease the metabolism and toxicity of theophylline: erythromycin, clarithromycin, beta-adrenergic blockers, cimetidine, influenza vaccine, oral contraceptives, disulfiram, SSRI antidepressants, interferons, mexiletine, thiabendazole, fluoroquinolones, or allopurinol.

Calcium Channel Blockers

Amlodipine (Norvasc^{R})

Bepridil (Vascor^{R})

Diltiazem (Cardizem^{R} CD, Cardizem^{R} SR, Cardizem^{R} Tablets, Dilacor^{TM} XR, Tiazac^{R})

Felodipine (Plendil^{R})

Isradipine (DynaCirc^{R})

Nicardipine (Cardene^{R}, Cardene^{R} SR)

Nifedipine (Adalat^{R}, Adalat^{R} CC, Procardia^{R}, Procardia^{R} XL)

Nimodipine (Nimotop^{R})

Nisoldipine (Sular^{R})

Verapamil (Calan^{R}, Calan^{R} SR, Covera^{R}-HS, Isoptin^{R}, Isoptin^{R} SR, Verelan^{R})

Mechanism of Action: Inhibit the transport of calcium into myocardial and vascular smooth muscle cells, resulting in inhibition of excitation-contraction coupling and subsequent contraction. Systemic and coronary vasodilation results in decreased blood pressure and decreased frequency and severity of anginal attacks. Verapamil-decreases SA and AV

conduction and prolongs AV node refractory period in conduction tissue. Suppresses ventricular tachyarrhythmias.

Indications: Management of hypertension, angina pectoris, and vasospastic (Prinzmetal's) angina. Verapamil-also management of supraventricular arrythymias and rapid ventricular rates in atrial fibrillation or flutter, prevention of migraine headaches, and management of cardiomyopathy or CHF. Diltiazem-also management of supraventricular arrythmias, rapid ventricular rate in atrial fibrillation or flutter, and management of Raynaud's syndrome. Nifedipine-also prevention of migraine headaches, and management of cardiomyopathy and CHF. Amlodipine and nicardipine-also management of cardiomyopathy and CHF. Nimodipine-prevention of vascular spasm after subarachnoid hemorrhage to decrease neurologic impairment.

Adverse Reactions and Side Effects:

CNS: Headache, dizziness, lightheadedness, syncope

Respiratory: Cough, dyspnea, shortness of breath

CV: peripheral edema, chest pain, hypotension, palpitations, arrythmias, CHF, bradycardia, tachycardia

GI: Nausea, vomiting

Miscellaneous: Stevens-Johnson syndrome

Dermatologic: Rash, diaphoresis, photosensitivity, flushing, pruritis

Endocrinologic: Gynecomastia

Drug Interactions: Additive hypotension may occur when use concurrently with opioids, other antihypertensive agents, nitrates, acute alcohol ingestion, or quinidine. Antihypertensive effects may be decreased by NSAIDs or corticosteroids. May increase risk

of toxicity from digoxin. Concurrent use of the following drugs may result in bradycardia, conduction defects, or CHF: beta-adrenergic blockers, digoxin, disopyramide, or phenytoin.

Calcium Phosphorus Regulating Hormone

Calcitonin, Salmon (Calcimar[R], Miacalcin[R])

Mechanism of Action: Decreases serum calcium by a direct effect on bone, kidney, and GI tract. Promotes renal excretion of calcium. Results in a decreased rate of bone turnover.

Indications: Management of postmenopausal osteoporosis.

Adverse Reactions and Side Effects:

GI: Nausea, vomiting, diarrhea

Miscellaneous: Allergic reactions including anaphylaxis, facial flushing, swelling

GU: Urinary frequency

Dermatologic: Rash

Local: Injection site reactions with IM or SC administration

HEENT: Nasal spray-epistaxis, nasal irritation, rhinitis

Musculoskeletal: Arthralgia, back pain

Drug Interactions:Previous bisphosphonate therapy may decrease the response to calcitonin.

Central Nervous System Stimulants

Amphetamine sulfate (Adderall[R])(C-II)

Methylphenidate (Ritalin[R], Ritalin[R]-SR) (C-II)

Mechanism of Action: Causes release of norepinephrine from nerve endings. Produces CNS and respiratory stimulation. Increases attention span in attention deficit hyperactivity disorder. Increases motor activity, mental alertness, and diminished fatigue in narcolepsy.

Indications: Adjunct in the treatment of attention deficit hyperactivity disorder. Symptomatic

treatment of narcolepsy.

Adverse Reactions and Side Effects:

CNS: Hyperactivity, insomnia, restlessness, tremor, dizziness, headache, irritabilitiy, akathisia, dyskinesia

CV: Hypertension, palpitations, tachycardia

GI: Anorexia, constipation, abdominal cramps, diarrhea, dry mouth, nausea, vomiting

Miscellaneous: Hypersensitivity reactions, physical dependence, psychological dependence, tolerance, weight loss

Drug Interactions: Additive sympathomimetic effects with other sympathomimetics, such as vasopressors, decongestants, or thyroid agents. Use with monoamine oxidase inhibitors, meperidine, or vasopressors may result in hypertensive crisis. May decrease the effectiveness of antihypertensives. Increases the risk of hypertension and bradycardia with beta-adrenergic blockers. Increases the riskof arrhythmias with digoxin. Tricyclic antidepressants may increase the risk of arrythmias, hypertension or hyperpyrexia.

Corticosteroids

Beclomethasone (Beclovent^{R}, Beconase^{R}, BeconaseR AQ, Vancenase^{R}, Vancenase^{R} AQ, Vanceril^{R})

Betamethasone (Beta-Val^{R}, Celestone^{R}, Diprolene^{R}, Diprosone^{R}, Valisone^{R})

Budesonide (Pulmicort^{R}, Turbuhaler^{TM}, Rhinocort^{TM})

Cortisone acetate (Cortone^{R} Acetate)

Dexamethasone (AK-Dex^{R}, Decaderm^{R}, Decadron^{R}, Decadron^{R} Turbinaie^{R}, Decadron^{R}-LA, Decaspray^{R}, Dekasol-L.A.^{R}, Maxidex^{R}, Ocu-Dex^{R})

Hydrocortisone (Anusol-HC® Suppository, Caldecort®, Cortef®, Cortifoam®, Hycort®, Hydrocort®, Hydrocortone® Acetate, Hydrocortone® Phosphate, Orabase® HCA)

Methylprednisolone (Medrol®)

Prednisolone (AK-Pred®, Pediapred®, Pred-Forte®, Prelone®)

Prednisone (Deltasone®, Liquid Pred®, Orasone®)

Flunisolide (AeroBid® Oral Aerosol Inhaler, Nasalide® Nasal Aerosol)

Fluticasone (Flonase®, Flovent™)

Triamcinolone (Amcort®, Aristocort®, Azmacort™, Kenalog®, Nasacort®)

Mometasone furoate (Elocon®)

Fluocinonide (Fluonex®, Lidex®, Lidex-E®)

Mechanism of Action: PO-Suppresses inflammation and the normal immune response. Replaces endogenous cortisol in deficiency states. Nasal/oral inhalants/topical-Locally acting anti-inflammatory and immune modifier to decrease symptoms of allergic rhinitis, decrease the frequency and severity of asthma attacks and prevention of pulmonary damage associated with chronic asthma, and suppression of dermatologic inflammatory and immune processes.

Indications: Topical-Management of various allergic/immunologic skin problems. Nasal-Seasonal allergic rhinitis and other chronic nasal inflammatory conditions. Inhalation/systemic- Maintenance and prophylactic treatment of asthma. Used systemically and locally in a wide variety of chronic diseases including: inflammatory, allergic, hematologic, neoplastic, and autoimmune disorders. Replacement therapy in adrenal insufficiency. Adjunctive management of nausea and vomiting from cancer chemotherapy.

Adverse Reactions and Side Effects:

CNS: Depression, euphoria, increased intracranial pressure in children, personality

changes, psychoses, restlessness, insomnia

CV: Hypertension, edema

GI: Peptic ulceration, increased appetite, nausea, vomiting, abdominal pain

Miscellaneous: Cushingoid appearance, increased susceptibility to infection

Dermatologic: Acne, decreased wound healing, ecchymoses, fragility of skin, excessive hair growth, petechiae

Hematologic: Thromboembolism, thrombophlebitis

Dermatologic: Topical-Allergic contact dermatitis, atrophy, burning, dryness, \ hypersensitivity reactions, hypopigmentation, irritation

Endocrinologic: Adrenal suppression, hyperglycemia

Fluid and Electrolytes: Fluid retention, hypokalemia, alkalosis

HEENT: Cataracts, increased intraocular pressure, Nasal-burning and irritation, sneezing attacks, nasal bleeding

Musculoskeletal: Muscle wasting, osteoporosis, aseptic necrosis of joints

Metabolic: Weight gain

Drug Interactions: Additive hypokalemia with diuretics, amphotericin B, piperacillin, or ticarcillin. Hypokalemia increases the risk of toxicity from digoxin. May increase requirements for insulins or oral hypoglycemic agents. Phenytoin, Phenobarbital, or rifampin may decrease the metabolism of corticosteroids and decrease the effectiveness. Oral contraceptives may decrease the metabolism of corticosteroids and increase the risk of adverse effects. Concurrent use of NSAIDs increases the risk of adverse GI effects. May decrease the antibody response to and increase the risk of adverse effects from live virus vaccines. May increase the risk of tendon rupture from fluoroquinolones.

Corticosteroids and Antibiotic/Antifungal Combinations

Bacitracin, neomycin, polymyxin B, and hydrocortisone (Cortisporin[R] Ophthalmic Ointment, Cortisporin[R] Topical Ointment)

Neomycin, polymyxin B, and hydrocortisone (Cortisporin[R] Ophthalmic Suspension, Cortisporin[R] Otic, Cortisporin[R] Topical Cream, PediOtic[R] Otic, UAD Otic[R])

Sulfacetamide sodium and prednisolone (Blephamide[R] Ophthalmic Cetapred[R] Ophthalmic)

Tobramycin and dexamethasone (TobraDex[R])

Nystatin and triamcinolone (Mycogen[R] II Topical, Mycolog[R]-II Topical)

Betamethasone and clotrimazole (Lotrisone[R] Topical)

See Corticosteroids and Antifungals.

COX-II Inhibitors (Nonsteroidal Anti-Inflammatory Agents)

Celecoxib (Celebrex[R])

Rofecoxib (Vioxx[R])

Mechanism of Action: Inhibit the enzyme cyclooxygenase-2, which is required for the synthesis of prostaglandins. Possess analgesic, antipyretic, and anti-inflammatory properties. Dose not inhibit cyclooxygenase-1 and may produce less GI damage than other NSAIDs.

Indications: Relief of the signs and symptoms of osteoarthritis. Management of acute pain in adults. Treatment of primary dysmenorrhea.

Adverse Reactions and Side Effects:

CV: Hypertension, lower extremitiy edema

GI: GI bleeding, nausea

Miscellaneous: Allergic reactions including anaphylaxis

Hematologic: Anemia

Drug Interactions: May decrease the effectiveness of diuretics or antihypertensives. Concurrent use of aspirin may increase the risk of GI bleeding. May increase the risk of bleeding with warfarin.

Diuretics, Loops

Bumetanide (Bumex^{R})

Furosemide (Lasix^{R})

Torsemide (Demadex^{R})

Mechanism of Action: Inhibit the reabsorption of sodium and chloride from the loop of Henle and distal renal tubule, increases renal excretion of water, sodium, chloride, magnesium, hydrogen, and calcium. May have renal and peripheral vasodilatory effects. Results in diuresis and mobilization of excess fluid, and lowers blood pressure.

Indications: Management of edema secondary to CHF or hepatic or renal disease. Treatment of hypertension.

Adverse Reactions and Side Effects:

CNS: Dizziness, encephalopathy, headache

CV: Hypotension

GI: Dyspepsia, nausea, vomiting

GU: Excessive urination

Dermatologic: Photosensitivity, rash

Hematologic: Blood dyscrasias

Endocrinologic: Hyperglycemia

Fluids and Electrolytes: Dehydration, hypochloremia, hypokalemia,

hypomagnesemia, hyponatremia, hypovolemia, metabolic alkalosis

HEENT: Hearing loss, tinnitus

Musculoskeletal: Arthralgia, muscle cramps, myalgia

Drug Interactions: Additive hypotension may occur with antihypertensive agents, nitrates, or acute alcohol ingestion. Additive hypokalemia may occur with other diuretics, piperacillin, amphotericin B, or corticosteroids. Hypokalemia may increase digoxin toxicity. Decreases lithium excretion and may cause toxicity. Incresed risk of ototoxicity with aminoglycosides. Effectiveness may be decreased by NSAIDs or corticosteroids.

Diuretics, Thiazides

Chlorothiazide (Diuril^{R})

Hydrochlorothiazide (Esidrix^{R}, HydroDIURIL^{R}, Microzide^{R})

Mechanism of Action: Increases excretion of sodium and water by inhibiting sodium reasorption in the distal tubule. Promotes excretion of chloride, potassium, magnesium, and bicarbonate. Lowers blood pressure and causes diuresis with mobilization of edema.

Indications: Management of hypertension. Treatment of edema associated with CHF, renal dysfunction, cirrhosis, corticosteroid therapy, or estrogen therapy.

Adverse Reactions and Side Effects:

CNS: Dizziness, lethargy, weakness

CV: Hypotension

GI: Anorexia, abdominal cramping, hepatitis, nausea, vomiting, pancreatitis

Dermatologic: Photosensitivity, rash

Hematologic: Blood dyscrasias

Endocrinologic: Hyperuricemia, hyperlipidemia

Fluids and Electrolytes: Hypokalemia, dehydration, hypercalcemia, hypochloremic acidosis, hypomagnesemia, hyponatremia, hypovolemia

Musculoskeletal: Muscle cramps

Drug Interactions: Additive hypotension may occur with antihypertensive agents, nitrates, or acute alcohol ingestion. Additive hypokalemia may occur with corticosteroids, amphotericin B, piperacillin, or ticarcillin. Decreases the excretion of lithium and may cause toxicity. Hypokalemia increases the risk of digoxin toxicity. NSAIDs or corticosteroids may decrease effectiveness.

Estrogens

Estrogens, conjugated (Premarin®)

Estrogens, esterified (Estratab®, Menest®)

Estropipate (Ogen®, Ortho-Est®)

Estradiol (Alora® Transdermal, Climara® Transdermal, Estrace® Oral, Estraderm® Transdermal, Estring®, Vivelle™ Transdermal)

Mechanism of Action: Estrogens promote the growth and development of female sex organs and the maintenance of secondary sex characteristics in women. Metabolic effects include decreased cholesterol, protein synthesis, and sodium and water retention. Restores hormonal balance in various deficiency states.

Indications: PO/Transdermal-As part of hormone replacement therapy in the treatment of moderate to severe vasomotor symptoms of menopause. Various estrogen deficiency states, including: female hypogonadism, ovariectomy, or primary ovarian failure. Adjunctive therapy of post-menopausal osteoporosis. Adjunctive therapy of advanced inoperable

metastatic breast and prostatic carcinoma. Vaginal-Management of atrophic vaginitis.

Adverse Reactions and Side Effects:

CNS: Headache, dizziness, lethargy, mental depression

CV: Myocardial infarction, thromboembolism, edema, hypertension

GI: Nausea, vomiting, weight changes, increased appetite, jaundice

Miscellaneous: Breast tenderness

GU: Women-amenorrhea, breakthrough bleeding, dysmenorrhe, cervical erosion, loss of libido, vaginal candidiasis. Men-Impotence, testicular atrophy.

Dermatologic: Acne, oily skin, pigmentation, urticaria

Endocrinologic: Gynecomastia, hyperglycemia

Fluids and Electrolytes: Hypercalcemia, sodium and water retention

HEENT: Intolerance to contact lenses, worsening of myopia or astigmatism

Musculoskeletal: Leg cramps

Drug Interactions: May alter the requirement for warfarin, oral hypoglycemic agents, or insulin. Barbiturates, phenytoin, or rifampin may decrease the effectiveness. Cigarette smoking increases the risk of cardiovascular adverse reactions.

Estrogen and Progestin Derivatives

Estrogens, conjugated and medroxyprogesterone (Prempro^{R}, Premphase^{R})

Ethinyl estradiol and ethynodiol diacetate (Demulen^{R}, Zovia^{R})

Ethinyl estradiol and levonorgestrol (Alesse^{TM}, Levlen^{R}, Levora^{R}, Nordette^{R}, Tri-Levlin^{R}, Triphasil^{R}, Ortho Tri-Cyclen^{R})

Ethinyl estradiol and norethindrone (Norinyl^{R} 1+35, Ortho-Novum^{R} 1/35, Ortho-Novum^{R}

7/7/7, Ortho-Novum[R] 10/11, Ovcon[R] 35, Ovcon[R] 50, Tri-Norinyl[R])

Ethinyl estradiol and norgestrel (Lo-Ovral[R], Ovral[R])

Mestranol and norethindrone (Norinyl[R] 1+50, Ortho-Novum[R] 1/50)

Mechanism of Action: Inhibits ovulation by suppression of follicle-stimulating hormone and luteinizing hormone. May alter cervical mucus and the endometrial environment, preventing penetration by sperm and implantation of the egg to prevent pregnancy.

Prempro[R]/Premphase[R]-See estrogens and progestins.

Indications: Prevention of pregnancy. Regulation of menstrual cycle. Emergency contraception. Management of acne in women greater then 14 years old who desire contraception, have no health problems, and have failed topical treatment.

Prempro[R]/Premphase[R]-Moderate to severe vasomotor symptoms associated with menopause in women with an intact uterus. Vulvular and vaginal atrophy. Prevention of osteoporosis.

Adverse Reactions and Side Effects:

CNS: Depression, migraine headaches

CV: Cerebral hemorrhage, cerebral thrombosis, coronary thrombosis, pulmonary embolism, edema, hypertension, Raynaud's phenomenon, thromboembolic phenomenon, thrombophlebitis

GI: Abdominal cramps, bloating, cholestatic jaundice, gallbladder disease, nausea, vomiting

Miscellaneous: Weight gain

GU: Amenorrhea, breakthrough bleeding, dysmenorrheal

Dermatologic: Melasma, rash

Endocrinologic: Hyperglycemia

HEENT: Contact lens intolerance, optic neuritis, retinal thrombosis

Drug Interactions: Oral contraceptive efficacy may be decreased by penicillins, chloramphenicol, dihydroergotamine, mineral oil, oral neomycin, sulfonamides, barbiturates, chronic alcohol use, carbamazepine, corticosteroids, griseofulvin, sulfonylureas, phenytoin, rifampin, or tetracyclines. Oral contraceptives may increase the risk of toxicity from tricyclic antidepressants, benzodiazepines, beta-adrenergic blockers, caffeine, corticosteroids, or theophylline. Smoking increases the risk of thromboembolic events.

Histamine-2 Antagonists

Cimetidine (Tagamet^{R}, Tagamet-HB^{R})

Famotidine (Pepcid^{R}, Pepcid^{R} AC Acid Controller)

Nizatidine (Axid^{R}, Axid^{R} AR)

Ranitidine bismuth citrate (Tritec^{R})

Ranitidine hydrochloride (Zantac^{R}, Zantac^{R}-75)

Mechanism of Action: Inhibit the action of histamine at the histamine receptor site located in gastric parietal cells, resulting in inhibition of gastric acid secretion. Ranitidine bismuth citrate-in addition to above, has some antibacterial action against *Helicobacter pylori*.

Indications: Short-term treatment of active duodenal ulcers and benign gastric ulcers. Prophylaxis of duodenal ulcers. Management of gastroesphogeal reflux disease. Treatment of heartburn, acid indigestion, and sour stomach. Management of gastric hypersecretory states such as Zollinger-Ellison syndrome. Management of GI symptoms associated with the use of NSAIDs. Prevention of acid inactivation of supplemental pancreatic enzymes in patients with pancreatic insufficiency. Management of urticaria. Ranitidine bismuth citrate-In combination with clarithromycin to eradicate *Helicobacter pylori* in the treatment of duodenal ulcers.

Adverse Reactions and Side Effects:

CNS: Confusion, dizziness, hallucinations

CV: Arrythmias

GI: Ranitidine bismuth citrate-abdominal pain, black stool, black tongue

Hematologic: Anemia, thrombocytopenia

Endocrinologic: Gynecomastia

Drug Interactions: Decrease the absorption of drugs that require an acidic pH (ketoconazole, itraconazole, iron salts, ampicillin).

Impotence Agent

Sildenafil (Viagra^{R})

Mechanism of Action: Enhances the effects of nitric oxide released during sexual stimulation. Nitric oxide activates guanylate cyclase, which produces increased levels of cyclic guanosine monophosphate (cGMP). cGMP produces smooth muscle relaxation of the corpus cavernosum, which promotes increased blood flow and subsequent erection. Also inhibits phophodiesterase type 5, which inactivates cGMP.

Adverse Reactions and Side Effects:

CNS: Headache

CV: Flushing

Drug Interactions: Concurrent use of nitrates is contraindicated because of the risk of serious and potentially fatal hypotension. Increased risk of hypotension with antihypertensives. Blood levels and risk of adverse effects may be increased by the following drugs: cimetidine, erythromycin, ketoconazole, itraconazole, or antiretrovirals.

Nitrates

Isosorbide dinitrate (Dilatrate^{R}-SR, Isordil^{R}, Sorbitrate^{R})

Isosorbide mononitrate (Imdur^{R}, ISMO^{R}, Monoket^{R})

Nitroglycerin (Deponit^{R}, Minitron^{R}, Nitro-Bid^{R} Ointment, Nitrodisc^{R}, Nitro-Dur^{R}, Nitrogard^{R}, Nitrol^{R}, Nitrolingual^{R}, Nitrostat^{R}, Transdermal-NTG^{R}, Transderm-Nitro^{R})

Mechanism of Action: Produces vasodilation to decrease left ventricular end-diatolic pressure and left ventricular end-diastolic volume. This results in a reduction of myocardial oxygen comsumption. Also increases coronary blood flow by dilating coronary arteries and improving collateral flow to ischemic regions. These effects relieve anginal attacks and increase cardiac output.

Indications: Nitrostat^{R}/Nitrolingual^{R}-Acute treatment of anginal attacks.

Long-term prophylactic management of angina pectoris. Treatment of chronic CHF.

Adverse Reactions and Side Effects:

CNS: Dizziness, headache, apprehension, weakness, syncope

CV: Hypotension, tachycardia, paradoxical bradycardia

GI: Abdominal pain, nausea, vomiting

Miscellaneous: Cross-tolerance

Dermatologic: Contact dermatitis, flushing

Drug Interactions: Concurrent use of sildanafil may result in significant and potentially fatal hypotension. Additive hypotension may occur with antihypertensive agents, acute ingestion of alcohol, or phenothiazines. Drugs with anticholinergic properties may decrease absorption of lingual, sublingual, or buccal nitroglycerin.

Potassium Salts

Potassium acid phosphate (K-Phos® Original)

Potassium bicarbonate and potassium citrate, effervescent (Effer-K™, Klor-Con®/EF, K-Lyte®, K-Vescent®)

Potassium chloride (Kaochlor®, Kaon-Cl®, Kaon-Cl-10®, K-Dur®10, K-Dur® 20, K-Lor®, Klor-Con®, Klor-Con® 8, Klor-Con®10, Klor-Con-25®, Klovess®, Klotrix®, K-Lyte®/Cl, K-Tab®, Micro-K® 10, Micro-K® Extencaps, Micro-K® LS, Potasalan®, Rum-K®, Slow-K®, Ten-K®)

Potassium gluconate (Kaon®, K-G®)

Potassium phosphate (Neutra-Phos®-K)

Potassium phosphate and sodium phosphate (K-Phos® Neutral, Neutra-Phos®)

Mechanism of Action: Forms containing phosphorus: phosphate is present in bone and is involved in energy transfer and carbohydrate metabolism. Serves as a buffer for the excretion of hydrogen ions by the kidneys. Results in urinary acidification which increases the solubility of calcium, decreasing calcium stone formation. Potassium maintains acid-base balance, isotonicity, and electrophysiologic balance of the cell. Serves as an activator in many enzymatic reactions which are essential to the transmission of nerve impulses, contraction of cardiac, skeletal, and smooth muscle, gastric secretion, renal fuction, tissue synthesis, and carbohydrate metabolism.

Indications: Treatment or prevention of potassium depletion. Phosphorus preparations- Treatment and prevention of phosphate depletion in patients who are unable to ingest adequate dietary potassium or phosphate. Prevention of calcium urinary stones. Treatment of hypokalemia with metabolic acidosis and coexisting phosphorus deficiency.

Adverse Reactions and Side Effects:

CV: Arrythmias, cardiac arrest, edema

GI: Diarrhea, abdominal pain, nausea, vomiting

Fluids and electrolytes: Hyperkalemia, hypernatremia, hyperphosphatemia, hypocalcemia, hypomagnesemia

Musculoskeletal: Muscle cramps, tremors

Neurologic: Flaccid paralysis, heaviness of legs, paresthesias

Drug Interactions: Concurrent use of potassium-sparing diuretics or angiotensin converting enzyme inhibitors may result in hyperkalemia. Concurrent use of corticosteroids with sodium phosphate may result in hypernatremia. Concurrent administration of calcium, magnesium, or aluminum containing drugs decreases absorption of phosphates by formation of insoluble complexes. Vitamin D enhances the absorption of phosphorus.

Progestin Derivatives

Levonorgestrel (Norplant^{R})

Medroxyprogesterone acetate (Provera^{R})

Megestrol acetate (Megace^{R})

Norgestrel (Ovrette^{R})

Progesterone (Crinone^{R} Vaginal Gel, Progestasert^{R})

Mechanism of Action: Combined with estrogen hormonal replacement therapy to decrease the risk of endometrial cancer. Contraceptive-Mechanism not clearly understood. May alter cervical mucus and the endometrial environment, preventing penetration by sperm and implantation of the egg. Ovulation may also be suppressed. Progesterone-Produces secretory changes in the endometrium, increases in basal body temperature, histologic changes in

vaginal epithelium, relaxation of uterine smooth muscle, mammary alveolar tissue growth, pituitary inhibition, withdrawal bleeding in the presence of estrogen. Restores hormonal balance with control of uterine bleeding and to provide a successful outcome in assisted reproduction technology. Megestrol-Antineoplastic effect may result from inhibition of pituitary function. Results in regression of tumor. Increases appetite and weight gain in patients with AIDS.

Indications: Norgestrel/levonorgestrel-prevention of pregnancy. Regulation of menstrual cycle. Emergency contraception. Management of acne in women greater than 14 years who desire contraception, have no health problems, and have failed topical treatment.

Medroxyprogesterone-To decrease endometria hyperplasia in postmenopausal women receiving concurrent estrogen. Treatment of secondary amenorrhea and abnormal uterine bleeding caused by hormonal imbalance. Treatment of obesity-hypoventilation syndrome, sleep apnea, and hypersomnolence. Megesterol-Pallative treatment of endometrial and breast carcinoma. Treatment of anorexia, weight loss, and cachexia associated with AIDS.

Adverse Reactions and Drug Interactions: See Estrogen and Progestin Derivatives.

Drug Interactions: See Estrogen and Progestin Derivatives.

Prostaglandin, Ophthalmic

Latanoprost (Xalatan^{R})

Mechanism of Action:Reduces intraocular pressure by increasing outflow of the aqueous humor.

Indications: Reduction of elevated intraocular pressure in patients with open-angle glaucoma

and ocular hypertension who are intolerant of other intraocular pressure lowering medications or insufficiently responsive.

Adverse Reactions and Side Effects:

Ocular: Blurred vision, burning and stinging, conjunctival hyperemia, foreign body sensation, itching

Drug Interactions: None

Proton Pump Inhibitors

Lansoprazole (Prevacid^{R})

Omeprazole (Prilosec^{R})

Esomeprazole (Nexium^{R})

Mechanism of Action: Suppresses gastric acid secretion by inhibition of the hydrogen-potassium-ATPase system located at the secretory surface of the parietal cells in the stomach. Blocks the final step in acid production.

Indications: Treatment of erosive esophagitis. Management of duodenal ulcers. Treatment of active benign gastric ulcer. Short-term treatment of symptomatic gastroesophogeal reflux disease. Treatment of pathologic hypersecretory conditions, including Zollinger-Ellison syndrome.

Adverse Reactions and Side Effects:

CNS: Dizziness, headache

GI: Diarrhea, abdominal pain, nausea

Dermatologic: Rash

Drug Interactions: May decrease absorption of drugs requiring an acidic pH (ketoconazole, itraconazole, iron salts, or ampicillin).

Sedative/Hypnotics, Benzodiazepines

Chlorodiazepoxide (Libritabs[R])

Chlorazepate (Tranxene[R])

Diazepam (Valium[R])

Estazolam (ProSom[R])

Flurazepam (Dalmane[R])

Lorazepam (Ativan[R])

Quazepam (Doral[R])

Temazepam (Restoril[R])

Triazolam (Halcion[R])

Mechanism of Action: Acts at many levels in the CNS, producing generalized depression.

Effects may be mediated by gamma-aminobutyric acid.
Indications: Short-term management of insomnia.

Adverse Reactions and Side Effects:

CNS: Dizziness, excessive sedation, hangover, amnesia, confusion, lethargy, mental depression, paradoxical excitation

Miscellaneous: Physical dependence, psychological dependence, tolerance

Dermatologic: Rash

Drug Interactions: Additive CNS depression occurs with other CNS depressants.

Sedative/Hypnotics, Miscellaneous

Zaleplon (Sonata[R])

Zolpidem (Ambien[R])

Mechanism of Action: Produces CNS depression by binding to gamma-aminobutyric acid receptors in the CNS. Causes sedation and induction of sleep.

Indications: Short-term treatment of insomnia.

Adverse Reactions and Side Effects:

CNS: Amnesia, depersonalization, dizziness, drowsiness, hallucinations, impaired psychomotor function, vertigo, weakness

GI: Nausea, vomiting

Miscellaneous: Hypersensitivity reactions, physical dependence, psychological dependence, tolerance

Dermatologic: Photosensitivity

HEENT: Abnormal vision

Drug Interactions: Additive CNS depression occurs with other CNS depressants.

Selective Estrogen Receptor Modulator

Raloxifene (Evista^{R})

Mechanism of Action: Binds to estrogen receptors, producing estrogen-like effects on bone, resulting in reduced resorption of bone and decreasing bone turnover.

Indications: Treatment and prevention of postmenopausal osteoporosis.

Adverse Reactions and Side Effects:

Miscellaneous: Hot flashes

Musculoskeletal: Leg cramps

Drug Interactions: Cholestryamine decreases absorption. May alter the effects of warfarin.

Skeletal Muscle Relaxants

Cyclobenzaprine (Flexeril^{R})

Metaxolone (Skelaxin^{R})

Mechanism of Action: Skeletal muscle relaxation probably due to CNS depression.

Indications: Adjunct to rest and physical therapy in the treatment of muscle spasm associated

with acute painful musculoskeletal conditions.

Adverse Reactions and Side Effects:

CNS: Dizziness, drowsiness, ataxia

Drug Interactions: Additive CNS depression with other CNS depressants.

Systemic Retinoid

Isotretinoin (Accutane^{R})

Mechanism of Action: A metabolite of vitamin A; reduces sebaceous gland size and differentiation. Results in diminution and resolution of severe acne. May also prevent abnormal keratinization.

Indications: Management of cystic acne resistant to more conventional therapy.

Adverse Reactions and Side Effects:

CNS: Depression, psudotumor cerebri, psychosis

CV: Edema

GI: Cheilitis, dry mouth, nausea, vomiting, abdominal pain, anorexia, hepatitis,

Dermatologic: Pruritis, palmar desquamation, photosensitivity, skin infections, thinning of hair

Hematologic: Anemia

HEENT: Conjunctivitis, epistaxis, blurred vision, decreased night vision, dry eyes

Musculoskeletal: Arthralgia, bone pain, hyperostosis

Metabolic: Decreased HDL cholesterol, hypercholesterolemia, hypertriglyceridemia, hyperglycemia, hyperuricemia

Drug Interactions: Additive toxicity with vitamin A and drugs having anticholinergic

properties. Increased risk of pseudotumor cerebri with tetracycline or minocycline. Concurrent use with alcohol increases hypertriglyceridemia. Drying effects are increased by concurrent use of benzoyl peroxide, sulfur, tretinoin, or other topical agents.

Thyroid Hormone

Levothyroxine (Levothroid[R], Levoxyl[R], Synthroid[R])

Mechanism of Action: Primary effect is to increase the metabolic rate of body tissues. Promotes gluconeogenesis. Increases utilization and mobilization of glycogen stores. Stimulates protein synthesis. Promotes cell growth and differentiation. Aids in the development of the brain and CNS.

Indications: Replacement or substitution therapy in diminished or absent thyroid function. Treatment of some types of thyroid cancer.

Adverse Reactions and Side Effects:

CNS: Insomnia, irritability, nervousness, headache

CV: Cardiovascular collapse, arrythmias, tachycardia, angina pectoris, hypotension, hypertension, increased cardiac output

GI: Abdominal cramps, diarrhea, vomiting

Dermatologic: Diaphoresis

Endocrinologic: Hyperthyroidism, menstrual irregularities

Metabolic: Weight loss, heat intolerance

Drug Interactions: Cholestyramine or colestipol decreases absorption and effectiveness of orally administered levothyroxine. May alter the effectiveness of warfarin. May cause an increase in the requirement for insulin or oral hypoglycemic agents in diabetics. Additive cardiovascular effects may occur with sympathomimetics. May decrease response to beta-

adrenergic blockers.

Urinary Antispasmodics, Anticholinergics

Tolterodine (Detrol^{R})

Oxybutynin (Ditropan^{R})

Mechanism of Action: Acts as a competitive muscarinic receptor antagonist resulting in cholinergically mediated bladder contraction. Decreases urinary frequency, urgency, and urge incontinence.

Indications: Treatment of overactive bladder function that results in urinary frequency, urgency, or urge incontinence.

Adverse Reactions and Side Effects:

CNS: Headache, dizziness, drowsiness

CV: Palpitations, tachycardia

GI: Dry mouth, constipation, dyspepsia

GU: Impotence

HEENT: Blurred vision, dry eyes, increased intraocular pressure, mydriasis

Dermatologic: Diaphoresis

Drug Interactions: Additive anticholinergic effects with other drugs having anticholinergic properties. Additive CNS depression with other CNS depressants. Monoamine oxidase inhibitors intensify and prolong the anticholinergic effect.