**Pharmacology**

**Definitions**

- **Pharmacodynamics**: Study of the mechanisms of action of drugs within the body and how drugs produce their effects in the body.
- **Pharmacokinetics**: Study of drug actions as they move through the body; the way the body absorbs, distributes, metabolizes and excretes drugs; mathematical study of drugs based on time and dose.
- **Pharmacology**: Study of biologically active compounds, how they react in the body and how the body reacts to them.
- **Pharmacist**: Study of harmful or poisonous effects of drugs.
- **Toxicology**: Study of drug reactions in the body that are adverse.

**Pharmacokinetics**

**Routes drugs take to get into the body**
- **Enteral**: Enters the body through the GI tract.
- **Parenteral**: Entrace the body through a different means (i.e., other than the GI tract).
- **Absorption**: At cellular level occurs through passive transport, active transport, pinocytosis and facilitated diffusion.

**Drug Storage Sites**

- **Tissue permeability**: Ability of drug to pass through the membranes rapidly affects the extent to which the drug moves around in the body.
- **Blood flow**: Once in the blood stream, will get to the organs and tissues that are highly perfused.
- **Excretion**: Can have a higher or lower rate of activity than the original drug; if drug can bind to a protein that will render the drug inactive; only an unbound drug can attach to the receptors.
- **Binding to subcellular components**: Binding can cause muscle to store drugs.

**Pharmaceuticals**

- **Trade Name**: Name selected by the pharmaceutical company.
- **Generic Name**: Scientific name, describes the atomic and molecular structure of a drug.
- **Chemical Name**: Name, abbreviation.

**Receptors**

- **Protein molecules with one or more binding sites, located on cell membranes**.
- **Receive a signal from the body’s chemicals: neurotransmitters, hormones, enzymes**.
- **Signal will cause a molecular event on the inside of the cell to occur**.
- **Drugs enhance (agonist), diminish (partial agonist) or block (antagonist) the generation, transmission or receiving of the signal**.
- **Affinity**: Attraction between a drug and a receptor.
- **High affinity Drug will bind easily to the receptor**.
- **Low affinity**: Requires a higher concentration of the drug to get a therapeutic response.

**Drug Potency**

- **Amount of drug required to produce a therapeutic response**.

**Dose Response Curve**

- **Effective Dose (ED)**: Amount of drug that produces a therapeutic response in 50% of the people taking it.
- **Toxic Dose (TD)**: Amount of drug that produces adverse effects in 50% of the people taking it.
- **Therapeutic Index (TI)**: Margin of safety; ratio between the TD and the ED.
- **The higher the TI, the safer the drug is considered to be**; in general, nonprescription drugs have much higher TIs than prescription drugs.

**Characteristics**

- **High abuse potential; not legal; no acceptable medical use**; no prescriptions available on prescription drug-scheduled; not stamped prescription; 30-day supply, no refills.
- **Less abuse potential; low/moderate physical dependence; high psychological dependence**; by prescription only, expires within 6 months; max. 5 refills on one script.
- **Limited use potential; accepted medical use; small amounts of narcotics used as antitussives (cough medicine) or anti-diarrheals; may not need a prescription but must be recorded as a transaction**.

**Examples**

- **C-1 to C-IV**: Heroin, LSD, cocaine, marijuana, methaqualone.
- **C-1 to C-IV**: Opium, morphine, coca, methadone.
- **C-1 to C-IV**: Amphetamines, codeine, barbiturates, Valium, Xanax, anabolic steroids.
- **C-1 to C-IV**: Chloral hydrate, meptobamate, para-phenobarbitol.
**Pharmaceutical Classifications**

**adrenocorticoinds**

Glucocorticoids Regulate carbohydrate, lipid and protein metabolism; block inflammation; regulate body's immune response

- **Indications**: Asthma, advance pulmonary tuberculosis, pericarditis, acute and chronic inflammation, adrenal insufficiency, antenatal use in preterm labor, hypercalcemia, cerebral edema, acute SCI, MS, shock

- **Common drug examples**:
  - Betamethasone Beclomet, QVAR, Vanceri
  - Hydrocortisone Cortet, Hycort
  - Methylprednisone Medrol, Meprolone, Metacort
  - Prednisone Apo-prednisone, Deltasone, Metcort, Orasone, Sterapred
  - Triamcinolone Azmacort, Nasacort

- **Adverse reactions** Primarily a catabolic effect on muscle, bone, ligament, tendon; suppression of hypothalamic-pituitary-adrenal pathway; Cushingoid syndrome with long-term use; other effects include euphoria, insomnia, psychotic behavior, pseudotumor, mental changes, bronchitis, restlessness, heart failure, hypertension, edema, acute tendon ruptures, delayed wound healing

- **Withdrawal symptoms if drugs stopped abruptly**: Fever, myalgias, arthralgias, malaise, nausea, orthostatic hypotension, dizziness, fainting, dyspnea, hypoglycemia

Mineralocorticoids Regulates electrolyte homeostasis

- **Indications**: Adrenal insufficiency, orthostatic hypotension in diabetics

- **Common drug examples**
  - Fludrocortisone acetate Florinef

- **Adverse reactions** Salt and water retention, hypertension, cardiac hypertrophy, edema, heart failure, bruising, diaphoresis, urticaria, allergic rash, hypokalemia

- **Note**: All adrenocorticoi drugs have both glucocorticoid and mineralocorticoid properties to some extent

**adrenergics**

Mimic naturally occurring catecholamines (epinephrine, norepinephrine and dopamine) or stimulate the release of norepinephrine

- **Indications**: Alpha-adrenergic agonists used to treat hypotension

- **Common drug examples**
  - Norepinephrine Lovenophed
  - Pseudephedrine Cenafed, Dimetapp, Sudafed, Traminic DM (OTC used to treat other conditions)

- **Adverse reactions**: Increased blood pressure, AV block; other effects include: nausea, vomiting, sweating, goose bumps, rebound miosis, difficulty in urinating, headache, dilated pupils, photophobia, burning, stinging and blurry eyes

Beta 1 adrenergic antagonists Bradydcardia, low cardiac output, paroxysmal atrial fibrillation or nodal tachycardia, ventricular fibrillation, cardiac output

- **Common drug examples**
  - Dobutamine hydrochloride Dobutrex

- **Adverse reactions** Tachycardia, palpitations and other arrhythmias, premature and ventricular contractions, tachycardrhythmias and myocardial necrosis

Beta 2 adrenergic antagonists Acute and chronic bronchial asthma, emphysema, congestive heart failure and shock

- **Common drug examples**
  - Albuterol sulfate Proventil, Ventolin, Volmax

- **Adverse reactions** Nervousness, tremors, headaches, tachycardia, palpitations, hypertension, nausea, vomiting, cough

Dopamine Improves blood flow to the kidneys; used in acute renal failure, heart failure and shock

- **Common drug examples**
  - Dopamine hydrochloride Intropin

- **Adverse reactions** Headaches, ectopic beats, tachycardia, hypotension, bradycardia, nausea, vomiting, hyperglycemia, asthma attacks, anaphylactic reactions

**aminoglycosides**

- **Indications**: Treat infections resistant to penicillin, septicemia, urinary tract infections, infections of skin, soft tissue and bone, gram-negative bacillary meningitis

- **Common drug examples**
  - Amikacin sulfate Aminik
  - Gentamicin sulfate Cidoycin, Gentosol
  - Neomycin sulfate Myccfadin

- **Adverse reactions** Systemic ototoxicity and nephrotoxicity, skeletal weakness and respiratory distress; oral meds can cause nausea, vomiting, diarrhea; local injections can cause phlebitis and abscess

**angiotensin-converting enzyme inhibitors**

- **Indications**: Treat high blood pressure and heart failure

- **Common drug examples**
  - Benazepril hydrochloride Lotensin
  - Captopril Capoten
  - Enalapril maleate Vasotec
  - Fosinopril sodium Monopril
  - Lisinopril Prinivil, Zestril

- **Adverse reactions** Persistent dry cough, skin rash, loss of taste, weakness, headaches, palpitations, fatigue, proteinuria, hyperkalemia

**angiotensin II receptor antagonists**

- **Indications**: Vasodilates arterioles by blocking the effects of angiotensin II, enhance renal clearance of sodium and water

- **Common drug examples**
  - Candesartan cilexetil Atacand
  - Eprosartan mesylate Teveten
  - Irbesartan Avapro
  - Losartan potassium Cozaar
  - Telmisartan Micardis
  - Valsartan Diovan

- **Adverse reactions** Dizziness, anxiety, confusion, cough, upper respiratory infections, myalgia, insomnia, hypertension, visual changes, GI/GU effects

**anticholinergics**

- **Indications**: Spastic conditions including Parkinson’s disease, muscle dystonia, muscle rigidity and extra-pyramidal disorders

**testosterone**

Testosterone used to promote maturation of male sex organs and development of secondary sex characteristics; promotes retention of calcium, nitrogen, phosphorus, sodium, and potassium; enhances anabolism

- **Indications**: Androgen deficiency resulting from testicular failure or deficiency of pituitary origin, palliative for metastatic breast cancer, postpartum breast engorgement, hereditary angioedema, endometriosis, fibrocystic breast disease

- **Common drug examples**
  - Danazol Cyclomen, Danocrine
  - Fluoxymesterone Halotestin
  - Testosterone Testopel pellets

- **Adverse reactions** Extensions of hormonal action

  - **Males**: Frequent and prolonged erections, bladder irritability, postpartum breast engorgement, hereditary angioedema, endometriosis, fibrocystic breast disease

  - **Females**: Clitoral enlargement, deepening of the voice, facial or body hair growth, unusual hair loss, irregular or absent menses

  - **Metabolic reactions**: Fluid and electrolyte retention, hypercalcemia, decreased blood glucose level, increased serum cholesterol, hepatic dysfunction

  - **Contraindicated**: Men with breast or prostate cancer or symptomatic prostrate hypertrophy, patients with severe cardiac, renal or hepatic disease or with undiagnosed genital bleeding

**alpha-adrenergic blockers**

Lower blood pressure by dilating peripheral blood vessels, reducing peripheral resistance

- **Indications**: Raynaud’s disease, acrocyanosis, frostbite, phlebitis, diabetic gangrene, hypertension, benign prostatic hyperplasia
antiparkinsonians:
- Orgaran
- Temazepam

Antispas, A-spas, Dibent, Dilomine, Dyskinesia:
- Atenolol: Lopressor
- Diphenhydramine syrup
- Propranolol: Heparin Lock Flush, Hep-lock
- Catapres, Dixarit
- Colestipol
- Diphenhydramine hydrochloride
- Lorazepam

Allergies:
- Betoptic, Kerlone
- Confusion
- Zebeta
- Robinul
- Esmolol: ProSom
- Corgard
- Diphenhydramine hydrochloride: Drowsiness, lethargy, vertigo, headaches and CNS depression, hypotension, bradycardia, nausea, constipation, joint pain, physical or psychological dependence
- Dicyclomine hydrochloride: Headache, anxiety, vertigo, dizziness, insomnia, fatigue, syncope, tinnitus, constipation, nausea, vomiting, anemia, muscle and joint pain
- Betaxolol hydrochloride: Lowering cholesterol, blood glucose levels, increased cholesterol and blood glucose levels, bradycardia, depression, hallucinations, sexual dysfunctions, skin hypopigmentation
- Valium, Zetran
- Seizure disorders (tonic-clonic and partial seizures), sedation, hypnosis, preanesthesia sedation, psychiatric use

bicarbonate antacids:
- Omeprazole: Losec, Misoprostol, Clarithromycin
- Lansoprazole: Protonix
- Pantoprazole: Protonix
- Lidocaine
- Diphenhydramine hydrochloride: Drowsiness, lethargy, vertigo, headaches and CNS depression, hypotension, bradycardia, nausea, constipation, joint pain, physical or psychological dependence
- Dicyclomine hydrochloride: Headache, anxiety, vertigo, dizziness, insomnia, fatigue, syncope, tinnitus, constipation, nausea, vomiting, anemia, muscle and joint pain
- Calcium channel blockers
- Relaxes smooth muscle to provide vasodilation and affects cardiac muscle to reduce HR and SV
- Barbiturates
- Seizure disorders (tonic-clonic and partial seizures), sedation, hypnosis, preanesthesia sedation, psychiatric use
Pharmaceutical Classifications (continued)

**Indications** Angina, arrhythmias, hypertension, migraine headaches, peripheral vascular disorders, subarachnoid hemorrhage, esophageal spasm (adjunctive therapy)

**Common drug examples**
- Amlodipine besylate Norvasc
- Bepridil hydrochloride Vascor
- Diltiazem hydrochloride Cardizem, Diltiazem, Tiazac
- Felodipine Plendil
- Isradipine DynaCirc

**Adverse reactions** Bradycardia, hypotension, fluid retention, palpitations, headaches from vasodilatation, flushes, rash, dizziness
- Verapamil can cause constipation
- Nifedipine can cause hypotension, reflex tachycardia, peripheral edema, flushing, light-headedness and headache
- Diltiazem can cause anorexia, nausea, heart block, bradycardia, heart failure and peripheral edema
- Nicardipine Cardene
- Nifedipine Procardal
- Nimodipine Nimotop
- Nisoldipine Sular
- Verapamil hydrochloride Calan, Isoptin, Verelan

**Antibiotics that inhibit bacterial cell wall synthesis, causing bacterial cell death**

**Indications** Serious infections of the lungs, skin, soft tissue, joints, urinary tract, blood (septicemia), abdomen and heart (endocarditis), second and third generation drugs can treat CNS infections (meningitis), Lyme disease

**Common drug examples:**
- First Generation:
  - Cefadroxil: Duricef
  - Cefazolin sodium: Ancef, Zinacef
- Cephalexin monohydrate: Biocef, Kellex, Novo-Lexin
- Cephalexin: Keftab
- Second Generation:
  - Cefaclor: Ceclor
  - Cefamandole nafatate: Mandol
  - Cefotetan disodium: Cefotan
  - Cefprozil: Cefzil
- Third Generation:
  - Cefdinir: Omnicef
  - Cefditoren pivoxil: Spectracef
  - Cefixime: Suprax
  - Cefoperazone sodium: Cefobid
  - Cefotaxime sodium: Claforan
  - Cefpodoxime proxetil: Vantin
  - Cefpirid: Ceptaz, Fortaz, Taxicef, Taxidime
- Fourth Generation:
  - Cefepime hydrochloride: Maxipime

**Adverse reactions** Mild rash, fever, fatal anaphylaxis (hypersensitivity), thrombocytopenia, transient neutropenia, reversible leukopenia; other effects include nausea, vomiting, diarrhea, abdominal pain, glossitis, dyspepsia; local venous pain and irritation are common at injection site

**Fluoroquinolones**

**Indications** Bone and joint infections, bacterial bronchitis, endocardial and urethral chlamydia, bacterial gastroenteritis, endocardial and urethral gonorrhea, intra-abdominal infections, emetic therapy for febrile neutropenia, pelvic inflammatory disease, bacterial pneumonia, bacterial prostatitis, acute sinusitis, skin and soft tissue infections, typhoid fever, bacterial urinary tract infections, chancroid, meningococcal carriers, bacterial septicemia, prophylaxis in prevention of bacterial urinary tract infections

**Common drug examples:**
- Ciprofloxacin: Ciloxan
- Erythromycin: Altheosin
- Gatifloxacin: Tequin
- Levofoxacin: Quixin
- Lomefoxacin: Hydrochloride Maxaquin
- Moxifloxacin: Avelox
- Norfloxacin: Chibroxin
- Ofloxacin: Floxin, Ocuflon
- Sparfloxacin: Zagan
- Trovafloxacin: Trovan

**Adverse reactions** Rarely seen; acute stimulation of the CNS causes acute psychosis, agitation, hallucinations and tremors; hepatotoxicity, tendonitis or tendon rupture; other effects include dizziness, headache, nervousness, drowsiness, insomnia, GI reactions and photosensitivity

**Fluorine-receptor antagonists**

**Indications** Duodenal ulcer, gastric ulcer, hypersecretory states, anal reflux, esophagitis, stress ulcer prophylaxis

**Common drug examples:**
- Cimetidine: Tageson
- Famotidine: Pepcid, Pepcid AC
- Nizatidine: Azaquin

**Adverse reactions** Mild transient diarrhea, neutropenia, dizziness, fatigue, arthralgias, gynecomastia

**HMG-CoA reductase inhibitors**

**Indications** Hyper cholesterol, mixed dyslipidemia, secondary prevention of cardiovascular events (except atorvastatin)

**Common drug examples:**
- Atorvastatin: Lipitor
- Fluvastatin: Lescol, Lescol XL
- Lovastatin: Mevacor

**Adverse reactions** Photosensitivity, hepatotoxicity, GI complaints, myopathy (usually muscle aches and weakness), insomnia

**Leukotrienes receptor blockers**

**Indications** Asthma

**Common drug examples:**
- Montelukast Sodium: Singular
- Zafirlukast: Accolate

**Adverse reactions** Electrolyte and metabolic disturbances, hypochloremic alkalosis, hypomagnesemia, hypotremia, hypercalcemia, hyperuricemia, elevated cholesterol levels, hyperglycemia, lethargy (overdose can progress to coma)

**Estra gens**

**Indications** Menopause, carcinoma of the prostate, cardiovascular risk prevention, prophylaxis of postmenopausal osteoporosis, contraception, some drugs are used in treatment of breast cancer—must be carefully selected patients and drugs

**Common drug examples:**
- Dienelestroprogest vaginal cream
- Estradiol: Alora, Climara, Esclim, Estrace, Estraderm, Estring, Fem Patch, Vivelle
- Estradiol cypionate: Depo-Estradiol Cypionate, DepoGynone, Depo-Gen
- Estradiol valerate: Depo-Estradiol, Gynoden LA 20, Valeren 20, Valeren 40
- Ethinyl estradiol: Estinyl
- Estropipate Ogen, Ortho-Est

**Adverse reactions** Menstrual bleeding, abdominal cramps, swollen feet or ankles, bloated sensation, breast swelling and tenderness, weight gain, nausea, loss of appetite, headaches, photosensitivity and loss of libido; long-term use can cause hypertension, thromboembolic disease

**Diuretics**

**Indications** Edema associated with heart failure, hypertension, renal impairment, hypertensive crisis

**Common drug examples:**
- Bumetanide: Bumex
- Ethacrynic acid: Endocur
- Furosemide: Lasix, Torsemide, Demadex

**Adverse reactions** Metabolic and electrolyte disturbances, hypochloremic alkalosis, hyperglycemia, hyperuricemia, hypomagnesemia, may cause hearing loss and tinnitus

**Potassium-sparing** Less potent than the other types, protects against potassium loss

**Indications** Edema associated with hepatic cirrhosis, nephritic syndrome, and heart failure, hypertension, primary hyperaldosteronism

**Common drug examples:**
- Amiloride hydrochloride: Midamor
- Spironolactone: Aldactone
- Triamterene: Dyrenium

**Adverse reactions** Hyperkalemia leading to arthralgias, nausea, vomiting, headaches, weakness, fatigue, bowel disturbances, cough and dyspepsia

**Hypertension**

**Indications** Edema caused by heart failure and nphritic syndromes, edema caused by pregnancy, hypertension, diabetes insipidus

**Common drug examples:**
- Benazepril hydrochloride: Naturin
- Chlorothiazide: Diuril
- Chlorothiazide: Hydrochlorothiazide: Esidrix, HydroDiuril, Microzide, Oretic
- Hydrochlorothiazide: Esidrix, HydroDiuril, Microzide, Oretic
- Hydroflumethiazide: Diuridil
- Indapamide: Lozol
- Metylclozithiazide: Aquaternsen, Endurion
- Metolazone: Mykro, Zaroxolyn
- Trichlormethiazide: Diurese, Metahydrin, Naqua

**Adverse reactions** Electrolyte and metabolic disturbances, hypochloremic alkalosis, hypomagnesemia, hypotremia, hypercalcemia, hyperuricemia, elevated cholesterol levels, hyperglycemia, lethargy (overdose can progress to coma)
### Nitrates
- **Indications**: Angina pectoris, acute myocardial infarction, hypertensive emergencies, heart failure and pulmonary edema associated with MI.
- **Common drug examples**: Isosorbide dinitrate, Apo-ISDN, Coronex, Isoril, Novosorbide, Sorbitrate.

### Nondaroidal Anti-Inflammatory (NSAIDS)
- **Indications**: Pain, inflammation, and fever; rheumatoid arthritis, juvenile arthritis and osteoarthritis; low-intensity headaches, arthralgia, myalgia, neuralgia and mild to moderate pain from dental or surgical procedures or dysmenorrhea.

### Nucleoside Reverse Transcriptase Inhibitors
- **Indications**: Used in combination with other drugs to treat HIV infections and AIDS; prevention of maternal/fetal HIV transmission, prevention of HIV infection after an occupational exposure.
- **Common drug examples**: Abacavir sulfate, Ziagen, Didanosine Videx, Lamivudine Combivir.

### Opioids (previously called narcotics)
- **Indications**: Analgesic used for moderate to severe pain associated with acute and chronic disorders including MI, postoperative pain or terminal cancer; pulmonary edema, preoperative sedation, anesthesia, cough suppression, diarrhea.
- **Common drug examples**: Codeine phosphate, codeine sulfate, Diphenoxylate hydrochloride, Lofene, Lomotil, Fentanyl citrate, Sublimaze, Fentanyl transdermal system, Duragesic, Meperidine hydrochloride, Demerol, Methadone hydrochloride, Dolphine, Mehadose, Morphine sulfate, Epimorph, Kadian, Statex, Oxycodone hydrochloride, Endocodon, Percodone.

### Opioid Mixed agonist-antagonist
- **Indications**: [See Opioids]
- **Common drug examples**: Buprenorphine hydrochloride, Buprenex, Butorphanol tartrate, Stadol, Nalbuphine hydrochloride, Nubain, Pentazocine hydrochloride, Talwin.

### Penicillin
- **Family of effective antibiotics with low toxicity**
- **Indications**: Natural penicillin infections like streptococcal pneumonia, enterococcal and nonenterococcal group D endocarditis, diphtheria, anthrax, meningitis, tetanus, botulism, actinomycosis, syphilis, and relapsing fever, Lyme disease; prophylaxis against pneumococcal infections, rheumatic fever, bacterial endocarditis.
- **Aminopenicillins**: Septicemia; gynecologic infections; respiratory, GU and GI tract infections, soft tissue, bone and joint infections.
- **Extended-spectrum penicillins**: Hard to treat gram-negative infections; given in combination with aminoglycosides.
- **Penicillinase-resistant penicillins**: Susceptible penicillinase producing staphylococci; much the same as for aminopenicillins.

### Phenothiazines
- **Indications**: Psychoses involving hallucinations, agitation, manic phase of bipolar psychoses; nausea and vomiting induced by CNS dysfunctions; anxiety; severe behavioral problems, abdominal pain associated with porphyria, delirium, neurogenic pain.
- **Common drug examples**: Aliphatic derivatives: Chlorpromazine hydrochloride, Chlorpromazine—20, Largactil, Thorazine, Promethazine hydrochloride, Anergan 50, Phenergan.
- **Piperazine derivatives**: Fluphenazine hydrochloride, Permitil, Prolixin, Perphenazine, Apo-Perphenazine, Trilafon.
- **Prochlorperazine**: Compazine, Stemetil.
- **Trifluoperazine hydrochloride**: Apo-Trifluoperazine, Stelazine.
- **Piperidine derivatives**: Mesoridazine besylate, Serentil.
- **Thoridazine**: Mellari-S.
- **Thiothixene hydrochloride**: Navane.

### Progestins
- **Indications**: Hormonal imbalance in women, endometriosis, carcinoma, contraception.
**Protease inhibitors**

Antiviral medication used with HIV patients

**Indications** HIV infection and AIDS

**Common drug examples:**
-amprenavir Agenerase
-Indinavir Crrixvan
-Lopinavir and ritonavir Kaletra
-Nelfinavir mesylate Viracept

**Adverse reactions** Kidney stones, pancreatitis, diabetes or hyperglycemia, ketoacidosis and pancreatitis all require medical attention; less probable are symptoms of generalized weakness, GI disturbances, headaches, insomnia, taste perversion, dizziness, somnolence

**Selective serotonin reuptake inhibitors**

Enhance serotonergic transmission through blocked reuptake at the synapse

**Indications** Depression, panic and eating disorders, obsessive compulsion, premenstrual dysphoria, posttraumatic stress and bipolar disorders, alcohol dependence, premature ejaculation, diabetic neuropathy

**Common drug examples:**
-Citalopram hydrobromide Celexa
-Fluoxetine Prozac, Sarafem
-Fluvoxamine maleate Effexor
-Paroxetine hydrochloride Paxil

**Adverse reactions** GI complaints, headaches, dizziness, somnolence, sexual dysfunction, tremors; less common reactions include breast tenderness or enlargement, extra-pyramidal effects, dystonia, fever, palpitations, weight gain or loss, rash, hives, itching

**Tetracycline**

Antibiotic

**Indications** Bacterial, antiprotozoal, rickettsial and fungal infections; sclerosing agent for pleural or pericardial effusion

**Common drug examples:**
-Doxycycline hyclate Vibramycin
-Minocycline hydrochloride Dynacin, Minocin, Virectin
-Tetracycline hydrochloride Achromycin, Panmycin, Tetralen

**Adverse reactions** Headache, nausea, vomiting, anorexia, heartburn, weakness and paresthesia

Toxic effects Anxiety, cold sweat, confusion, cool pale skin, difficulty concentrating, drowsiness, excessive hunger, nervousness, rapid heartbeat, weakness, unusual fatigue

**Thrombolytic enzymes**

Developed to reduce a blood clot and prevent permanent ischemic damage

**Indications** Thrombosis, thromboembolism

**Common drug examples:**
-Alteplase Activase, Cathflo Activase
-Anistreplase, reteplase Eminase
-Streptokinase Streptase
-Tenecteplase TNKase
-Urokinase Abbobinase

**Adverse reactions** Anorexia, flatulence, nausea, vomiting, stoll disturbances, epigastric burning, abdominal discomfort, rash

**Skeletal muscle relaxant I**

Polysynaptic inhibitors (inhibit interneuron transmission in the spinal Cord)

**Indications** Muscle spasms caused by acute injuries, supportive therapy for tetanus

**Common drug examples:**
-Carisoprodol Soma
-Chlorzoxazone Paraflex, Parafon Forte
-Cyclobenzaprine hydrochloride Flexeril
-Methocarbamol Carbacot, Robaxin, Skelex
-Orphenadrine citrate Norflex

**Adverse reactions** Drowsiness, vertigo, tremor, headaches, light-headedness, nausea, vomiting, confusion

**Skeletal muscle relaxant II**

Indirect and direct skeletal muscle relaxants

**Indications** Spasticity caused by an upper motor neuron lesion like MS

**Common drug examples:**
-Baclofen Lioresal
-Diazepam Valium
-Dantrolene sodium Danturin

**Adverse reactions** Drowsiness, dizziness, weakness, fatigue, hypertension, paresthesias, confusion, dysarthria, constipation, vomiting, liver dysfunction

**Sulfonamides**

First drugs to treat systemic, bacterial infections

**Indications**
-**Bacterial infections** Effective with staphylococci, streptococci, clostridium tetani, urinary tract infections, nocardiosis, ottis media
-**Parasitic infections** Inflammation, pneumonic plague

**Sulfonylureas**

Lower blood glucose levels by stimulating insulin release from the pancreas

**Indications** Type 2 diabetes mellitus, neurogenic diabetes insipidus

**Common drug examples:**
-**First Generation:**
  -chloropropamide: Diabinese, Novo-propamide
  -tolazamide: Tolinase
  -tolbutamide: Orinase
-**Second Generation:**
  -glimepiride: Amaryl
  -glipizide: Glucotrol
-**Glucosidase:**
  -glyburide: DiaBeta, Glynase Pres Tab, Micronase

**Adverse reactions** Headache, nausea, vomiting, anorexia, heartburn, weakness and paresthesia

**Toxic effects** Anxiolytics, cold sweat, confusion, cool pale skin, difficulty concentrating, drowsiness, excessive hunger, nervousness, rapid heartbeat, weakness, unusual fatigue

**Tricyclic antidepressants**

Enhance adrenergic neurotransmitter transmission through blocked reuptake at the synapse

**Indications** Depression, obsessive compulsive disorder, enuresis, severe chronic pain, phobic disorders, bulimia, short-term treatment of duodenal or gastric ulcers

**Common drug examples:**
-Amitriptyline hydrochloride Elavil, Levate, Novotryptin
-Clomipramine hydrochloride Anafranil
-Desipramine hydrochloride Norpramin
-Doxepin hydrochloride Sinequan, Triadapin
-Imipramine hydrochloride Apo-Imipramine, Impril, Novopramine
-Impiramine pamoate Tofranil-AM
-Nortriptyline hydrochloride Aventyl HCL, Pameler
-Trimipramine maleate Surmontil

**Adverse reactions** Sedation, anticholinergic effects, orthostatic hypotension; specific drugs may cause seizures

**Vitamin K inhibitors**

**Indications** Pulmonary emboli, DVT, MI, atrial arrhythmias

**Common drug examples:**
-Warfin Coumadin

**Adverse reactions** Fever, anorexia, nausea, vomiting, cramps, diarrhea, mouth ulcerations, hemorrhage, jaundice

**Note to Students** Due to its condensed format, please use this QuickStudy™ as a guide, but not as a replacement for assigned classroom study.

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