Drug Classifications

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Drug Classes

- Drug classes are group names for drugs that have similar activities or are used for the same type of diseases and disorders.
- A drug is assigned to a class when the manufacturer makes an application to the United States Adopted Names council (USAN).
- USAN and manufacturer agree to a pharmacological or therapeutic classification.
- This is not an official brand or generic name, it may be listed in different classifications by different sources.

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Drug Classes

- There are common stems or syllables that are used to identify the different drug classes.
- USAN approves the stems and syllables and recommends using them in making new nonproprietary names.
- The list is ever changing.

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Common Stems and Syllables

Stem	Drug Class
-lol	Beta blockers
-andr-	Androgens
-setron	Serotonin receptor antagonists
-arabine	Selected Antineoplastics
-ase	Enzymes
-azepam	Antianxiety Agents
-zosin	Alpha blockers

Stem	Drug Class
-bactam	Beta-lactamase inhibitors
-bamate	Tranquilizers/antiepileptics
-barb	Barbituric acid derivatives
-butazone	Anti-inflammatory analgesics
-caine	Local anesthetics
-cef or ceph	Cephalosporins
-cillin	Penicillins
-conazole	Anti-fungals
-cort	Cortisone derivatives
-curium	Neuromuscular blocking agents
-cycline	Tetracycline antibiotics

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Common Stems and Syllables

Stem	Drug Class
-dralazine	Select Antihypertensives
-erg-	Ergot alkaloid derivatives
-estr-	Estrogens
-fibrate	Select Antihyperlipidemics
-flurane	Inhalation anesthetics
-gest-	Progestins
-irudin	Anticoagulants
-leukin	Interleukin-2 derivatives (block inflam. response)
-lukast	Leukotriene antagonists
-mab	Monoclonal antibodies (immune system)

Stem	Drug Class
-mustine	Select Antineoplastics
-mycin	Antibiotics
-poetin	Erythropoietins
-olone	Steroids
-oxacin	Fluoroquinolone antibiotics
-thiazide	Select Diuretics
-pamil	Coronary vasodilators
-parin	Heparin derivatives
-peridol	Select Antipsychotics

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Common Stems and Syllables

Stem	Drug Class
-pred	Prednisolone derivatives
-pril	Antihypertensives(ACE inhibitors)
-profen	Anti-inflamatories/analgesics
-rubicin	Select Antineoplastics
-artan	Angiotensin II receptor antagonists (ARB's)
-setron	Serotonin receptor antagonists
-sulfa	Sulfanomide antibiotics
-terol	Bronchodlators
-thiazide	Diuretics
-ipine	Calcium channel blockers

Stem	Drug Class
-tocin	Oxytocin derivatives
-trexate	Select Antimetabolites
-triptyline or ipramine	Select Antidepressants
-statin	Select Antihyperlipidemics

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Classification Schemes

There are various systems for classifying drugs:

- By disorder
- By body system affected
- Type of receptor acted on
- Type of action

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Classification Schemes

- A number of classifications are based on whether they influence the parasympathetic or sympathetic nervous system.
- Most organs in the body are influenced by both of these two nervous systems.
  - ❖They stimulate opposing responses, which balances their effects and results in a normal state of homeostasis (state of equilibrium in the body).
- Drugs that act on the parasympathetic system are called cholinergic because acetylcholine is the neurotransmitter of this system.
- Drugs that act on the sympathetic nervous system are called adrenergic, because the neurotransmitters for this system (norepinephrine and epinephrine) are secreted from the adrenal glands.

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Classification Schemes

- Many classifications are also named for the type of interaction with the receptor.
  - ❖Agonist or antagonist interaction is the primary basis for classification (i.e., cholinergic antagonist, etc.) but drugs may be classified on specific receptor characteristics.
  - ❖Example: adrenergic receptor responses may be categorized as alpha (α) or beta (β)

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Classification Schemes

- Classification schemes have grown significantly as different types of receptors have been discovered.
  - ❖ Each new type of receptor has been found to be responsible for a specific pharmacological effect.
  - ❖ As drugs designed to interact with these receptors are developed, the complexity of classification increases.

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Classification Schemes

- Other factors that complicate classification schemes:
- A factor for drugs that affect the autonomic nervous system is the use of prefixes and suffixes.
  - ❖ blocker, -lytic, or anti- to mean antagonist, and mimetic to mean agonist.
- Another factor is the presence of neurotransmitters other than acetylcholine, norepinephrine, and epinephrine.
  - ❖ Serotonin, dopamine, histamine, gamma-amino butyric acid (GABA), etc.
  - ❖ Each has sub-types and each has agonists and antagonists that act by a variety of mechanisms.

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Drug Classifications-Analgesics

- Analgesic drugs create a state in which the pain from a painful medical condition is not felt……or is a "dulled response"

Several types of analgesics:

- Two groups are used for mild to moderate pain-the non-steroidal anti-inflammatory drugs (NSAIDs) and the salicylates.
- Opiate-type narcotic analgesics are used for severe pain
  - ❖ Morphine and codeine-naturally occurring opiates
  - ❖ Meperidine and propoxyphene-synthetic opiates
  - ❖ All called narcotic analgesics and have an abuse potential.

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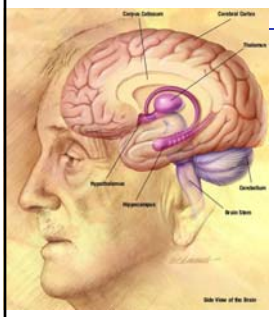
Drug Classifications-Analgesics



Transmission of Pain
Nerve fibers carry pain impulses from the body's receptor sites through the spinal cord and up to the thalamus and cerebral cortex. **Analgesics** are thought to depress the thalamus and interfere with the transmission of pain impulses. In addition, the brain's interpretation of pain may be altered with the use of these drugs.

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Anesthetic Agents

- Anesthetics cause an absence of sensation or pain

Two groups: Local and General

- **Local anesthetics** block pain conduction from the peripheral nerves to the CNS without causing a loss of consciousness.
- Locals indicated for dental work, childbirth pain, sunburn, hemorrhoids and skin irritations.
- Locals grouped by chemical structure:
  - ❖Esters- metabolized by enzymes found in the blood or skin. Short to moderate duration of effectiveness- procaine, benzocaine
  - ❖Amides- metabolized in the liver and therefore longer acting- lidocaine, procainamide
  - ❖Others – agents suitable for patients with allergies to esthers and amides-dyclonine, pramoxine

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Anesthetic Agents

General anesthetics depress the CNS to the level of unconsciousness.

Classified according to their route of administration: inhalation or intravenous

There are 4 stages of general anesthesia:

Stage 1- analgesia-euphoria with loss of pain and consciousness

Stage 2- excitement-increase in sympathetic nervous system effects such as blood pressure, heart and respiratory rate

Stage 3 –the stage at which surgery can safely be conducted.

Stage 4 – medullary paralyses- an overdose of anesthesia can compromise the respiratory and heart centers of the brain's medulla and cause death

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Anti-infectives, Antimicrobials (Antibacterials, Antivirals, Antifungals)

- Anti-infectives treat disease produced by microorganisms such as bacteria, viruses, fungi, protozoa, and parasites
- Large number of naturally occurring, semi-synthetic and synthetic drugs and vaccines available for treatment of infectious diseases.

Specialized forms of anti-infectives include:

- Antimycobaterials -agents that treat tuberculosis, leprosy and the MAC complex in AIDS)
- Antiprotozoals-agents that treat malaria, vaginitis, and sleeping sickness
- Anthelminthics- agents that treat parasitic worms (init. In GI)

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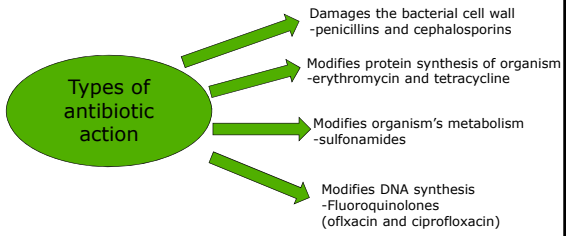
Antibacterials, Antivirals, Antifungals



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Antibacterials, Antivirals, Antifungals

Antibiotics (antimicrobials) are chemicals which suppress the growth of microorganisms. Antimicrobials can be either **bacteriostatic** (inhibiting bacterial growth) or **bacteriocidal** (bacteria killing).

Antivirals inhibit the replication of viruses (**virustatic**). The viral microorganisms will invade the host cell and proliferate using the cell's DNA and RNA. To effectively treat viral infections, the drug needs to stop the viral replication without destroying the patient's healthy cells. Mutations and resistance are common challenges. Antibacterials are not effective with viral infections, but may be used in cases of accompanying secondary bacterial infection. **Protease inhibitors** (e.g., saquinavar, indinavir) have been successful in blocking the enzyme responsible for viral replication.

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Antibacterials, Antivirals, Antifungals

Antifungals are used to treat fungal infections. Fungi are plant-like micro-organisms commonly found as molds and yeasts. The drugs chosen to treat these mycosis or mycotic infections are usually **fungicidal**. The fungal cell is destroyed as the drug prevents cell permeability and nutrition. Common fungal infections include candidiasis (vaginal yeast infection), ringworm, and athlete's foot. Nystatin and fluconazole are common antifungals.

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Antineoplastics

Antineoplastics inhibit the new growth of cancer cells or neoplasms.

Cancer cells are abnormal in structure and growth rate and offer no usual function, have unusual genetic content and often reproduce quickly and uncontrollably.

Side effects caused by many of these drugs are uncomfortable and serious-immunosuppression (compromising one's own immune system), anemia, hair loss, GI ulceration, and dehydration/weight loss caused by nausea and vomiting.

Due to toxicity of many antineoplastics, normal healthy cells are destroyed along with the cancerous cells.

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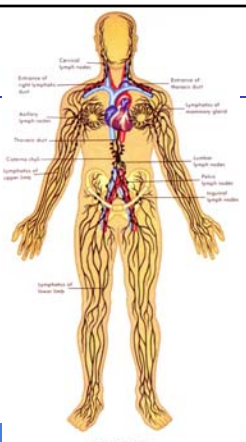
Antineoplastics

The lymphatic system is the center of the body's immune system. It filters fluid from around cells. When people refer to swollen glands in the neck, they are usually referring to swollen lymph nodes. Common areas where lymph nodes can be easily felt, especially if they are enlarged, are: the groin, armpits, above the clavicle, in the neck, and the back of the head just above hairline.

Antineoplastics target rapidly growing cells which not only includes cancer cells but GI tract, hair follicles, and bone marrow as well. Because they depress the immune system, patients are often susceptible to infections.



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Antineoplastics

Antimetabolites- classified in accordance with the substances they interfere with, these drugs inhibit cell growth and replication by mimicking natural metabolites and taking their place within the cells. These fake metabolites inhibit the synthesis of important cellular enzymes, including DNA.

Alkyating Agents – these drugs interfere with mitosis or cell division by binding with DNA and preventing cellular replication. Although these agents will afect all cells, those that are growing at a more rapid rate (presumably cancerous) will be more affected. Nitrosureas, a type of alkylating agent are lipid soluble and pass easily into the brain where they have some activity in treating brain cancers.

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Cardiovascular Agents

▪**Some of the most widely used medications available are used to treat cardiovascular diseases and conditions.**

Cardiovascular agents include:

▪**Antianginals**-used to treat cardiac related chest pain (angina) resulting from ischemic heart disease(an inadequate supply of blood to a part of the body, caused by partial or total blockage of an artery).
▪Patients suffer a lack of oxygen and blood flow to the myocardium. Nitrates, beta-blockers, and calcium channel blockers are examples of antianginals.

Normal heart rhythm

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Cardiovascular Agents

▪**Antiarrythmias**- used to treat irregular heart rhythms. They regulate the conduction activity of the heart by inhibiting the abnormal pacemeaker cells or recurring abnormal impulses and restoring a normal rhythm. Antiarrythmics include beta blockers and drugs that block sodium channels, potassium ion channels, and calcium ion channels.

▪**Antihypertensives**- used to reduce a sustained elevation in blood pressure. Factors affecting blood pressure include stress, blood volume, arterial narrowing, age, gender, and general condition of health. Common antihypertensives include beta-blockers to reduce cardiac output, diuretics to decrease fluid volume, ACE inhibitors to reduce salt/water retention and inhibit vascular constriction, and calcium channel blockers to relax blood vessels.

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Cardiovascular Agents

- **Vasopressors**- act to **increase** blood pressure. If a patient is in a state of shock due to decreased blood volume, inadequate cardiac output or severe infection, fluids may be introduced to provide adequate blood volume. In addition to fluid replacement, vasopressors may be used to help supply blood to the brain and kidney.
- **Antihyperlipidemics-** used to lower high levels of cholesterol that can lead top blocked blood vessels. Cholesterol is a lipid normally present in the body that is essential for healthy cell function. Cholesterol levels are measured as total cholesterol, LDL (low density lipoprotein), and HDL (high density lipoprotein). Excessive amounts of LDL can lead to blocked blood vessels and cardiovascular problems. HMG-CoA Reductase inhibitors("statins") are used to treat high LDL levels.

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Cardiovascular Agents

- **Thrombolytics / Anticoagulants-** thrombolytics are used to dissolve blood clots and anticoagulants are used to prevent their formation. Thrombolytics can be dangerous since blood clotting can be disturbed, resulting in profuse bleeding and even fatal bleeding. However, in cases of impending myocardial infarction or stroke, a traveling blood clot (embolus) can be dissolved and the stroke prevented. There has been much success with this group of drugs in recent years. A common thrombolytic agent is alteplase. Common anticoagulants are warfarin and heparin.

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Dermatologicals

- **Dermatologicals** are used to treat a condition or disease related to the skin.
- Skin is the largest organ and protects the other organs against microorganisms, trauma, extreme temperature, and other harmful elements.
- Common dermatological agents include steroids, antihistamines and anti-infectives.
- Examples: hydrocortisone cream, diphenhydramine, silver sulfadiazine cream, doxycycline hyclate, and ofloxacin.
  - The drying agent zinc oxide is often seen in a combination product with the local anesthetic camphor, moisture absorbing agent kaolin, and an anti-infective such as triclosan when treating diaper rash.

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Electrolyte Agents

- Electrolytes are water soluble minerals that are contained in our body fluids **as salts.**
- They form electrically charged particles called ions which attract water. They have both positive and negative charges and are responsible for fluid movement in and out of our cells. Changes in the body's normal electrolyte count affect fluid movement and balance and consequently various body functions.
- Water is the primary element in the body, accounting for more than half of body weight.

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Electrolyte Agents

- Electrolytes are water soluble minerals that are contained in our body fluids as salts.
- They form electrically charged particles called ions which attract water. They have both positive and negative charges and are responsible for fluid movement in and out of our cells. Changes in the body's normal electrolyte count affect fluid movement and balance and consequently various body functions.
- Functions these electrolytes affect include blood pressure, blood coagulation, muscle contractions, myocardial conduction, energy levels and enzyme production.
- Water is the primary element in the body, accounting for more than half of body weight.

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Electrolyte Agents

- Common electrolytes include sodium (Na^+), potassium (K^+), calcium (Ca^{++}), chloride (Cl^-) and magnesium (Mg^{++}).

❖The plus and minus signs indicate their electrical charges.

<u>Opposites Attract:</u>

- Water molecules (H_2O) are polarized (they have negatively and positively charged sides). For this reason, many compounds dissociate (come apart) in water to form ions and the ions in turn associate with water molecules.

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Immunobiologic Agents

A vaccine is a suspension containing infectious agents used to boost the body's immune system response.

Two forms of vaccine presently exist:

One allows **passive immunity** by giving an individual the antibody. This form offers a shorter period of protection.

The other form stimulates the patient's immune system to produce an antibody. This **active immunity**, is a longer lasting type of immunity.

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Immunobiologic Agents

Current Vaccines:

Smallpox

DPT-Diptheria, pertusses, and tetanus)

MMR- measles, mumps and rubbella)

Polio Typhoid

Rabies

Hepatitis A and B

BCG-antitubercular agent

Haemophilus Influenza Type B(HIB)

Chicken Pox

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Gastrointestinal Agents

- **Gastrointestinal agents** are used to treat disorders of the stomach and/or intestines.
- Drugs include enzymes, antidiarheals, antiemetics (anti-vomiting) antiulcer agents, laxatives and stool softeners.
- **Enzymes**-**Pepsin** is a normal gastric enzyme that breaks down proteins. However, in the absence of pepsin, it is still possible for the digestive system to break down protein molecules into amino acids using proteolytic enzymes found in the small intestine. If a patient's condition warrants using therapy (as with cystic fibrosis and chronic pancreatitis) products that contain **pancreatin**, an agent prepared from pork pancreas, or **pancrealipase** may be indicated. Malabsorption conditions such as steatorrhea, where fat is inadequately digested and is excreted in large amounts in feces, may be treated with pancrealipase.

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Gastrointestinal Agents

- **Antidiarrheals-** diarrhea is a condition of frequent watery stools which results from microorganism invasion, drug or stress reaction, chronic GI inflammation and/or other circumstances causing a decrease in intestinal absorption of water, an increased secretion of electrolytes into the intestines or an excessive amount of mucus production. **Antiperistaltics-** drugs slow the movement of the intestinal contents to allow for greater water and electrolyte absorption. Loperamide is a common antiperistalsis agent and diphenoxylate plus atropine is another popular antidiarrheal agent. *Bismuth subsalicylate* (Pepto-Bismol) is a **secretory inhibitor** that acts to prevent organisms from attaching to the intestinal mucosa and may deactivate certain toxins as well. In cases of infectious diarrhea, antibiotics such as oral metronidazole or vancomycin may also be indicated. Some antibiotics can kill normal bacterial flora or facilitate regrowth of resistant microorganisms, and so lead to diarrhea.

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Gastrointestinal Agents

- **Antiemetics**- this class of drugs treats the condition of nausea and vomiting. There are many causes of this condition which is usually a symptom or side effect of as opposed to being the actual condition itself: food or drug reaction or allergy, pregnancy, anxiety, exhaustion, dehydration, and a large number of diseases or illnesses such as cancer, or a micro-organism related infection such as otitis media. Often these agents are ordered in conjunction with other drug therapies used to treat underlying conditions.

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Gastrointestinal Agents

- **Antacid/antiulcer agents-** generally composed of inorganic salts such as calcium carbonate, aluminum hydroxide, and magnesium hydroxide which are popular agents used to neutralize existing acid, as opposed to inhibiting its production. Cimetidine, Ranitidine, Famotidine are (H-1) histamine receptor antagonists that inhibit the secretion of gastric acid by blocking its effects.
- **Laxatives and Stool Softeners-** these agents are commonly prescribed to treat constipation, the condition of dehydrated stool causing bowel movements which are infrequent, hard, and often painful. Laxatives promote defecation without stress or pain and are often suggested for use prior to use for certain medical procedures related to the bowel (barium enema), for constipation, and for patients with hemorrhoids, recent hernia surgery or heart attack where straining is to be avoided

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Gastrointestinal Agents

Types of laxatives:

- Bulk forming laxatives swell as they mix with intestinal contents
- Stimulants irritate the lining and nerves of the intestine
- Saline/Osmotics promotes watery stool by drawing water into the intestine-may cause cramping.
- Stool softeners /Surfactants promote the mixing of fat and water with intestinal contents to soften the stool and ease the evacuation of feces.

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Hematological Agents

- **Phytonadione** (Vitamin K_1) A drug that stimulates the liver to produce several clotting factors and mimics the action of Vitamin K (a natural clotting promotor).
- **Hematopeietics** are drugs that treat various forms of anemias by stimulating or helping to stimulate blood cells.
- **Hemostatic** drugs are used to treat or prevent excessive bleeding. These systemic agents include aminocaproic acid and aprotinin. Their primary action is to inhibit the activation of plasminogen.
- **Topical hemostatics** are used when minor bleeding of small blood vessels occur when sutures are not required- thrombin powder, oxidized cellulose.

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Hematological Agents

Clotting Cascade
The main stages of natural clot formation and dissolution are:

Thromboplastin is formed from blood and tissue (**platelet aggregation**) at tissue injury site.

↓

Thrombin is formed from prothrombin and thromboplastin

↓

The fiber fibrin is formed from thrombin acting on fibrinogen (clot formation).

↓

Fibrinolysin breaks down fibrin (clot breakdown)

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Neurologic Agents

Parkinson's disease- drugs can only SLOW the progress of this disease. Instead an increase in quality of life, decreased side effects and minimization of disabilities are the goals of chemical treatment. Anticholinergics are are used for treatment of tremors and decreased muscle tone.

Alzheimer's Disease- therapy divided into treatment for cognitive symptoms most closely associated with dementias and noncognitive symptoms like depression. Many agents are cholinesterase inhibitors.

Epilepsy-anticonvulsants inhibit abnormal impulses within the CNS by inhibiting one or more ions such as sodium, clacium, or potassium within the CNS. Agents include hydantoins, barbituates, and benzodiazepines.

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Psychotropic Agents

Antipsychotics

Two main classifications of antipsychotic drugs are **phenothiazines and thioxanthenes**. They differ in length and effectiveness.

Long-acting medications may be **decanoates** and are dosed monthly.

In addition to the decanoates, there are short-acting daily doses of the same type of drug.

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Psychotropic Agents

The drug action as it relates to the two agents within two comon class of antipsychotics (**phenothiazine and thioxanthene**) is the inhibition of dopamine within the CNS.

The main indication for these agents is psychosis.

Antideppressants

Three losely related agents used to commonly treat depression:

Tricyclics (TCAs)-these agents inhibit(slow) the reuptake (cells taking back excess amounts) of norepinephrine and serotonin.

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Psychotropic Agents

Monoamine Oxidase Inhibitors (MAOIs)- differ from TCAs and SSRIs by their side affects. Many food interactions. Reserved for patients who do not respond to TCAs or SSRIs.

Selective Serotonin Reuptake Inhibitors (SSRIs)-act specifically to maintain higher levels of serotonin in the brain. When serotonin is increased, mood is elevated. They work differently than MAOIs and TCAs. Fewer side effects.

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Endocrine System

Biophosphonates-inhibits bone resorption and treat/prevent osteoporosis.

Thyroid drugs-thyroid hormones are used for supplemental or replacement needs with hypothyroidism. Usually initiated in small doses until an response is reached.

Antidiabetics- lowers blood glucose levels. Treats type I and type II diabetes mellitus. Insulin used for type I diabetes patients who cannot produce enough insulin from the pancrease. Type II diabetics are treated with diet and exercise and oral antidiabetics

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Endocrine System

Glucocorticoids-steroid hormones (such as cortisone) that exert an anti-inflammatory effect and influence many body functions. Controlled by release of ACTH from pituitary gland. Prolonged use may suppress the pituitary and adrenal glands and the body will not produce its own hormone. These hormones cannot be stopped abruptly and a step-down dosage is used to taper the amount given gradually. Prednisolone, methylprednisolone, and prednisone are common glucocorticoids.

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Musculoskeletal Agents

Rheumatoid arthritis is a chronic and often progressive inflammatory condition linked to dysfunction in the immune system. There is no known cure or prevention for this condition. Drug therapy consists mainly of NSAIDs that inhibit prostoglandin synthesis and reduce inflammation. As condition progresses, disease modifying antirheumatic drugs (DMARDs) such as methotrexate (antineoplastic) as well as gold preparations such as gold injections (aqueous) and aurothioglucose (suspended in oil) are indicated.

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Musculoskeletal Agents

Gout is an inflammatory condition in which an excess of uric acid and urate crystals accumulate in synovial fluids of the joints. First line drug used is would be colchicine. Uricosuric drugs (probenecid) increase elimination of uric acid and xanthine oxidase inhibitors (allopurinol) interfere with uric acid synthesis.

Osteoarthritis is marked by weight bearing bone deterioration, decreasing range of motion, and increasing pain, deformity, and disability. Drug therapy consists mainly of analgesics, NSAIDs and the corticosteroids.

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Musculoskeletal Agents

Muscle spasms are painful occurrences that can be infrequent, chronic, or acute, depending on their origin and the patient's underlying medical condition. Centrally acting antispasmodics (diazepam) eliminate contracture and cramps without affecting normal muscle activity. Drugs frequently used for these symptoms include carisoprodol and cyclobenzaprine …effective to decrease muscle tone and reduces spasms…..sedation is a challenge.

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Ophthalmic Agents

Ophthalmic agents are used to treat various conditions or disorders of the eye.

- Due to the special requirements for ophthalmic formulations, there are often many ingredients in a product besides the active ingredient-preservatives, buffers, antioxidants, and wetting agents that control factors such as pH, sterility, and proper isotonic percentages.
- **Antiglaucoma agents-** cholinergic receptor agonists such as pilocarpine and acetylcholine were first used. Now acetylcholinesterase agents are used to decrease ocular pressure.

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Ophthalmic Agents

- **Antiglaucoma agents**- **(continued)** beta-adrenergic receptor aantagonists are now used more commonly than than the cholinergic receptor agonists as they are considered more effective and have fewer side effects – betaxolol, carteolol, timolol. **Adrenergic receptor agonists** such as epinephrine, atropine and dipivefrin are used to lower intraocular pressure by increasing outflow of aqueous humor from the eye.
- **Conjunctivitis**- "Pink Eye"is a common eye infection resulting from conjunctival irritation due to infectious organisms. Antibiotics such as gentamicin, bacitracin, may be indicated for bacterial infections.
- Allergies may also cause this symptom-inflammation only.

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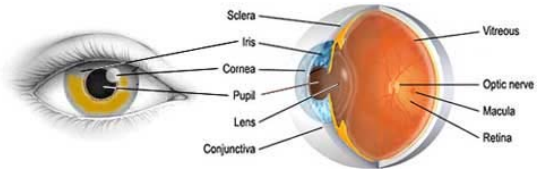

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Respiratory Agents

- Drugs commonly indicated in the treatment of respiratory diseases and disorders include antihistamines, decongestants, antitussives, and bronchodilators.

  Antihistamines act to block the release of (H-2)histamine (inflammation producing substance from white blood cells that occurs with an injury or allergic reaction) These agents replace histamine at the inflammation receptor sites to reduce inflammation, swelling, and irritation. Additional properties of antihistamines include antipruritic (anti-itching), antiemetic, and sedative.

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Respiratory Agents

- **Decongestants** cause mucous membrane vasoconstriction, reduction of nasal passage drainage and relief of stuffiness. Available as both oral agents (pseudoephedrine) and nasal sprays (phenylephrine)
- **Expectorants** are used to treat a congested cough by thinnning the mucus to facilitate expectoration of the phlegm
- **Antitussives / Cough Suppresants** are centrally acting products which treat both productive (with phlegm) and non-productive (without phlegm) coughs.

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