LESSON 11 - PHARMACOLOGY

A. DEFINITION AND LINGUISTIC TERMS

*Pharmacology* is the “study of drugs and their interactions with living organisms.” The term *pharmacology* comes from the Greek word, *pharmacon*. The term, *drug* is derived from the Dutch word, *droog*, which means “dry,” and refers to the use of dried herbs and plants. The Latin word for drug is *medicina* from which we derive the term *medicine*.

Pharmacology is one of the oldest branches of medicine. Ancient people such as Sumerians and Egyptians recorded the use of drugs on clay tablets and papyrus as early as 2000 BC. At that time, diseases were treated with frog’s bile, sour mold, lizard’s blood, pig’s teeth, hippopotamus oil, and toad’s eyes. The ancient Egyptians applied moldy bread to abrasions, a practice that may have had some therapeutic basis since many centuries later *penicillin was extracted from mold.*

Ancient drugs contained many ingredients prepared with standard recipes that involved drying, crushing, and combining a variety of plants or organic substances. The symbol “Rx,” comes from the Latin word “recipe,” meaning “take,” and in its current use, indicates a prescription, the combining of ingredients to form a drug.

B. MODERN DRUGS DERIVED FROM NATURAL SOURCES

A number of drugs are used today based upon old remedies. Note: Some words are capitalized and some are not. You will learn more about why and when.

<table>
<thead>
<tr>
<th>PLANT, ANIMAL, AND MINERAL SOURCE</th>
<th>MODERN DRUG</th>
</tr>
</thead>
<tbody>
<tr>
<td>foxglove plant (Digitalis lanata)</td>
<td>digoxin</td>
</tr>
<tr>
<td>rose hips</td>
<td>vitamin C</td>
</tr>
<tr>
<td>Belladonna</td>
<td>atropine, scopolamine</td>
</tr>
<tr>
<td>willow bark</td>
<td>aspirin</td>
</tr>
<tr>
<td>Opium poppy</td>
<td>morphine</td>
</tr>
<tr>
<td>Vinca (periwinkle plant)</td>
<td>vincristine</td>
</tr>
</tbody>
</table>
mold  penicillin
beef or pork pancreas  insulin
saffron flower  colchicine
Ephedra plant  Primatene, Bronkaid, diet pills
sheep’s wool  lanolin

C. DRUG TERMINOLOGY

Discussion will be presented in three categories:

1. Systems of Measurements
2. Dosage Schedules
3. Related Terms and Symbols

1. SYSTEM MEASUREMENTS

In the early history of pharmacology, measurements of drug dosages were crude and imprecise. The powdered, dried herbs in many prescriptions contained varying amounts of active drugs that could not be measured accurately.

In the 1700s the apothecary system was introduced from England. The term, “apothecary” comes from the Greek word and refers to a person who combines and distributes drugs.

The metric system was invented by the French and is based on the length of a meter. The use of the metric system was made legal in the United States, but was not mandatory. In 1975, Congress passed the Metric Conversion Act, but with the few exceptions of scientists, doctors, and other professionals in the medical/scientific field, few laypersons use the metric system on a regular basis. The metric system is officially known as the International System of Units (SI). The SI was officially adopted as the exclusive unit of measurement by the American Medical Association, July 1, 1988.
VOLUME/WEIGHT/LENGTH

Apothecary weights include grains, scruples, drams, ounces, pounds and their metrical equivalents. So the SI system we will be focusing on will deal with these metric values.

Drug measurements (lots more than those listed, but these are the most commonly used).

- cubic centimeter (cc) Note: cc is often seen as mL
- gram (g or gm)
- microgram (mcg)
- milligram (mg)
- decagram (dg)
- hectogram (hg)
- kilogram (kg)
- liter (l)
- microgram (mcg)
- milliequivalent (mEq)
- milligram (mg)
- milliliter (mL)
- ounces (oz)

SPECIAL NOTE: You may have already noticed that the metric system abbreviations are never followed by a period.

The basic measurement of length in the metric system is the meter. A centimeter is equivalent to 1/100th of a meter. When a cube is formed that is one centimeter (cm) long on each side, it becomes a measurement of volume known as a cubic centimeter, abbreviated as “cc,” or “mL.”
You will need to know the correct abbreviation forms for units of measure since they are the acceptable standard in medical charting, ordering prescriptions, and in dictation, transcription, coding and billing.

**OTHER DRUG MEASUREMENTS**
- unit (u)
- international unit (IU)
- inch (in)
- drop
- percentage
- ratio
- household

### 2. DOSAGE SCHEDULES (frequency of use)

Standard dosage schedules and the common abbreviations.

**Note:** The handwritten chart will show these as all capitals, e.g., “AC,” without periods, however, in transcription you do not capitalize them, but you do use the periods.

- a.c. before meals
- ad lib as needed
- p.r.n. as needed
- h.s. at bedtime
- q.h.s. at every bedtime
- n.p.o. nothing by mouth
- p.o. by mouth
- p.c. after meals
- q every
- q.d. every day
- q.o.d. every other day
- q.h. every hour
- b.i.d. twice a day
- t.i.d. three times a day
- q.i.d. four times a day
- stat immediately
3. RELATED TERMS AND SYMBOLS

• Intravenous (IV)
• Intramuscular (IM)
• / = per
• drops – (gtt) – the Latin word is *guttae*, (goo-tay) and you will hear doctors say that.

Drugs measured in units are vitamins, antibiotics (penicillin notably), and insulin.

Pediatric doses are expressed as mg/kg/day. This means the amount of medication per each kilogram of body weight per day (or hour).

►Example: Pedialyte 15 mg/20 kg/t.i.d.
►Example: 1 kilogram = 1000 g. 1 gram (g) = 1000 milligrams (mg)
1 milligram = 1000 micrograms (mcg)

D. DRUG DESIGN, SPELLING, PACKAGING, ADMINISTRATION

1. CHEMICAL NAME

From the moment of its discovery or design, every drug has a chemical name that describes its molecular structure and distinguishes it from other drugs.

2. GENERIC NAME

The pharmaceutical company, along with the “United States Adopted Names Council,” then determine a second name for the drug, its generic name.

3. BRAND NAME

When the Federal Drug Administration (FDA) gives final approval, then the manufacturer alone selects a third name known as a trade or brand name, which is filed with a registered trademark.
Only the original manufacturer has the right to advertise and market the drug under the trade/brand name.

4. SPELLING AND CAPITALIZATION

The accurate spelling of drug names is important. Spelling of some generic groups of drugs may be similar to reflect their chemical similarity and thus, the chemical name. Chemical names are not so important; however, it is important to denote the difference when a brand drug versus a generic drug is dictated by the physician. All brand names are capitalized, whereas all generic drugs are not.

How to know the difference:

Most commonly used drugs today are a combination of brand and generic. The general knowledge of drug pharmacology is important in transcription in spelling, and use of brand versus generic use and capitalization.

Most drugs are dispensed either by brand or generic form. Typically, the generics are less expensive, costing half (or less) than their brand name counterparts. With the onset of Health Maintenance Organizations (HMOs) and stricter rules enforced by the insurance providers, physicians or hospitals usually dispense drugs in the generic form to help reduce the costs. Some drugs do not have generic alternatives, thus the drug will be prescribed as a brand name. Below are examples of brand names and their generic components

<table>
<thead>
<tr>
<th>Examples:</th>
<th>Brand Name</th>
<th>Generic Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valium</td>
<td>diazepam</td>
<td></td>
</tr>
<tr>
<td>Ativan</td>
<td>lorazepam</td>
<td></td>
</tr>
<tr>
<td>Serax</td>
<td>oxazepam</td>
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</tbody>
</table>

PACKAGING

Before a drug can receive final approval from the FDA, the pharmaceutical company must clearly state in what form or forms the drug will be manufactured and what routes of administration are determined for safety and effectiveness.
<table>
<thead>
<tr>
<th>Medical Terminology I</th>
<th>© 2002 - 2010</th>
<th>All rights reserved.</th>
<th>tablet</th>
<th>Dried, powdered, compressed form</th>
</tr>
</thead>
<tbody>
<tr>
<td>esoteric enteric</td>
<td>A tablet that is covered with a special coating that dissolves in the intestine in order to avoid stomach upset.</td>
<td></td>
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</tr>
<tr>
<td>capsule</td>
<td>Comes in 2 varieties. One is a gelatin or soft capsule that contains liquid and is fat-soluble. The second is in a powdered or granular form inserted into clear gel capsules that fit together.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cream</td>
<td>A topical medication infused with water and oil</td>
<td></td>
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<tr>
<td>liquid</td>
<td>Medication comes in the form of either solution or suspension. Elixir: Solutions that contain an alcohol and water base with sugar and flavoring. Suspension: Contains fine, undissolved particles suspended in liquid.</td>
<td></td>
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</tr>
<tr>
<td>suppository</td>
<td>A solid base of glycerin or cocoa butter containing the drug administered either rectally or vaginally.</td>
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<tr>
<td>transdermal</td>
<td>A multilayered disk consisting of a drug reservoir, a porous membrane, and an adhesive layer to hold it to the skin. Nicotine patches are transdermal.</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**ROUTES OF ADMINISTRATION**

<table>
<thead>
<tr>
<th>oral – p.o. (per oral)</th>
<th>The oral (by mouth) route is the most convenient route of administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>sublingual</td>
<td>Medication is placed under the tongue and allowed to dissolve slowly.</td>
</tr>
<tr>
<td>vaginal/rectal</td>
<td>Medication is absorbed via these routes. They are reserved for certain clinical situations such as when the patient is vomiting and medication cannot be given orally or in other ways.</td>
</tr>
<tr>
<td>topical</td>
<td>A drug is applied directly to the skin, mucous membranes of the eyes, ears, nose, or throat.</td>
</tr>
<tr>
<td>transdermal</td>
<td>Transdermal: This route of administration differs from the topical route in that the drug is applied to the skin via physical delivery through a patch with a porous membrane for slow release.</td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td>This route involves the inhaling of a drug in a gas or liquid form. Usually designed for absorption through the lungs. Asthmatic conditions require inhalers such as a bronchial inhaler (bronchodilator).</td>
</tr>
<tr>
<td><strong>Parenteral</strong></td>
<td>Parenteral is a general term taken from the two Greek words <em>para</em> and <em>entero</em>, which literally mean “apart from the intestine.” Technically, parenteral means all routes of administration other than by mouth. Never confuse this word with parental (smile).</td>
</tr>
<tr>
<td><strong>Intradermal</strong></td>
<td>Involves the administration of a drug by injection into the dermis, the second layer of skin just below the epidermis.</td>
</tr>
<tr>
<td><strong>Subcutaneous</strong></td>
<td>Involves administration of a drug injected into the subcutaneous tissues (the fatty layer just under the dermis of the skin, but above the muscle layer).</td>
</tr>
<tr>
<td><strong>Intramuscular “IM”</strong></td>
<td>Involves administration of a drug injected into the belly (area of greatest mass) of a large muscle.</td>
</tr>
</tbody>
</table>
| **Intravenous “IV”** | This administration of a drug involves injection of liquid directly into a vein and may be done in one of three ways:  
1. **IV Push.** Fluid is manually pushed using the IV mode in a very short period of time or fluid is pushed into an existing IV bottle and administered continuously over several hours.  
2. **IV Drip.** A drug is mixed in a very small IV bottle and administered in drip form over several hours.  
3. **IV Piggyback.** A small secondary IV bag or bottle is connected through tubing to a port of an existing IV bottle. |
| **Endotracheal “ET”** | This route of administration is used during emergency resuscitative measures or to deliver pulmonary drugs to intubated patients via an endotracheal tube. |
| **Intrathecal – IT Greek=Theka = sheath** | This route of administration involves the injection of a liquid within the sheath or meninges of the spinal cord. Example: Spinal anesthesia commonly used in surgery. |
E. CLASSIFICATION
You may research for drugs classification as well as by name. Following is a list of classifications. Example(s) are listed under each classification. You can sometimes narrow your search using the categories if you can’t understand a word clearly, and find a word similar to the one you are looking for.

Dosages are also a dilemma at times. Understanding standard dosimetry ranges may help when questions arise. Use the on-line lab sites to assist, both with classification and dosage.

Take a look at the FDA website and explore the resources this government agency provides. http://www.fda.gov/default.htm

**Analgesics** (pain relievers); two main types: non-narcotic for mild pain and narcotic-containing (usually opium) for severe pain.
- Acetaminophen
- Aspirin

**Antacids** (relieving indigestion and heartburn by neutralizing acid)
- Amphogel
- Maalox

**Antianxiety** (sometimes known as anxiolytics, includes sedatives or minor tranquilizers, sleeping pills, etc.)
- Ativan
- Aventyl (also an antidepressive)

**Antiarrhythmics** (used to control heart irregularities, generally digitalis or quinidine, but also include beta-blockers)
- Digitoxin - digoxin
- Lanoxin (generic is digoxin)
- Verapamil hydrochloride

**Antibacterials** (see antibiotics, used to treat infections)

**Antibiotics** (see antibacterials)
- Penicillin
- Amoxicillin
- Amoxil

**Anticancer** (used to treat cancer, also known as cytotoxins or antineoplastics)
- Vincristine sulfate
- Myleran

**Anticoagulants** (also known as *thrombolytics*; prevent blood from clotting)
- Coumadin
- Warfarin

**Anticonvulsants** (prevent epileptic seizures)
- Carbamazepine
- Clonazepam

**Antidepressants** (mood-lifting, includes tricyclics and monoamine oxidase inhibitors (MAOIs))
- Elavil
- Imipramine hydrochloride

**Antidiarrheals** (for the relief of diarrhea, usually absorbent substances, kalin, chalk, charcoal, combined with drugs that slow down bowel contractions)
- Imodium
- Lomotil

**Antiemetics** (used to treat nausea and vomiting, motion sickness)
- Promazine hydrochloride (also an antipsychotic)

**Antifungals** (treat fungal infections, hair, skin, nails, mucous membranes, either as tablets, creams, ointments or suppositories)
- Amphotericin B
- Grifulvin, griseofulvin

**Antihistamines** (used to counteract the effects of histamine, a chemical involved in allergic reactions naturally produced by the body)
- Alavert (loratadine)
- Benadryl (diphenhydramine)

**Antihypertensives** (used to lower blood pressure, usually either beta-blockers or diuretics)
- Catapres
- Minipress

**Anti-inflammatories** (reduce inflammation, heat, swelling, increase blood flow, usually contain analgesics, corticosteroids and nonsteroidal drugs like *indomethacin*)
- Butazolidin
- Butazone
- Motrin

**Antineoplastics** (see anticancer, treat cancer, cytotoxin)
Antipsychotics (used to treat symptoms of severe psychiatric disorders)
  • Chlorpromazine hydrochloride (HCl)
  • Promazine

Antipyretics (used to reduce fever, mostly aspirin and acetaminophen which are also analgesics)

Antispasmodics (reduce spasms)
  • Bentyl
  • Mepenzolate bromide
  • Cantil
  • Reglan *(also an antiemetic)

Antirheumatics (see anti-inflammatories)
  • Meclofenamate sodium / Meclomen

Antivirals (used to treat viral infections or provide temporary immunity as in flu)

Aperients (see laxatives)

Barbiturates (see sleeping drugs, sedatives, hypnotics and anticonvulsives)

Beta-blockers (These are adrenergic [adrenal gland] blocking agents, which may reduce the oxygen needs of the heart by reducing the rate. They are also in the antihypertensive and antiarrhythmic drug categories)
  • Inderal (propranolol)

Bronchodilators (open up bronchial tubes within the lungs and ease breathing, commonly in aerosol sprays, tablet, liquid or suppositories)
  • Albuterol
  • Alupent (metaproterenol sulfate)

Carbonic anhydrase inhibitors (used to decrease pressure in the eye for glaucoma treatment)

Cold remedies (used to relieve symptoms, contain antihistamines and decongestants)

Corticosteroids (hormonal preparations for use with anti-inflammatories or immunosuppressants)
  • Aristocort
  • Betamethasone

Cough suppressants (for cough symptoms)
  • Codeine phosphate
Cytotoxins (kill or damage cells, antineoplastics, immunosuppressives)
  • Actinomycin D
  • Adriamycin

Decongestants (reduce mucous membrane swelling, which constricts blood vessels)
  • Afrin
  • Dimetapp

Dehydrating agents (see diuretics)

Diuretics (increase the quantity of urine produced by the kidneys in attempt to rid the body of excess fluid)
  • Hydrochlorothiazide

Fungicide (see antifungals)

Hormones (chemicals produced naturally by the endocrine glands, thyroid, adrenal, ovary, testis, pancreas, parathyroid)

Hypoglycemics (lower level of glucose in the blood)
  • Chlorpropamide
  • Diabinese

Immunosuppressives (prevent or reduce the body’s normal reaction to invaders by disease or foreign tissues, as in transplants)

Laxatives (increase frequency and ease of bowel movements by bowel stimulation or increasing the bulk)

Muscle relaxants (relieve muscle spasm)
  • Chlorzoxazone
  • Methocarbamol

Nausea (antiemetics, prevent nausea, vomiting, motion sickness)
  • Antivert

Oral contraceptives (see sex hormones / female)

Pain killers (see analgesics)

Sex hormones / female (two groups, estrogens and progestins, used to treat menstrual and menopausal disorders and are used as contraceptives)
**Sex hormones / male** (androgenic hormones, testosterone is one, are used to treat cancer, may be in the form of anabolic steroids [make one more muscular])

**Sleeping drugs** (sedatives, hypnotics, include antianxiety drugs and barbiturates)
- Butabarbital
- Phenobarbital (anticonvulsive too)
- Pentobarbital
- Chloral hydrate

**Thrombolytics** (see anticoagulants)

**Vasodilators** (dilate blood vessels for things like angina and circulatory disorders)
- Isordil
- Nitro-bid
- Nitroglycerin

### F. PHARMACEUTICALS BY SPECIALTY

Pharmaceuticals are obviously used consistently by medical specialists. This next series provides the specialty and its typical drugs, brand and generic names, uses, associated diseases, conditions and treatment.

1. **DERMATOLOGY**

Because of the superficial nature and location of most dermatologic diseases, they respond well to *topical* (surface area, meaning on the skin) drug therapy. Mild skin cases such as acne, psoriasis, poison ivy, contact dermatitis, superficial infections, herpes simplex infection, lice, and diaper rash can be successfully treated with topical agents. As you have probably experienced yourself, some over-the-counter medications may be used to treat minor skin conditions. However, a widespread case with large, open areas, and/or weeping areas requires prescription strength drugs as well as drugs dispensed orally. We will discuss common over-the-counter (OTC) drugs as well as prescription drugs.

▶ **Acne vulgaris:** is the form of acne common to adolescents. Creams, lotions, liquids, and gels are used topically to cleanse away oils and dead skin, to close pores, and to inhibit the
growth of skin bacteria. Ointments are not used in the treatment of acne because of the high oil content and oil’s tendency to clog the pores.

**Over-The-Counter (OTC) Topical Drugs**

- Benzoyl peroxide
- Clearasil
- StriDex
- Oxy-5
- tretinoin or Retin A

**Prescription Topical Antibiotics**

- Clindamycin (Cleocin T)
- erythromycin
- tetracycline (Topicycline)

**Vitamin A-type Drugs for Acne**

- Tretinoin (Retin-A)

Psoriasis is a chronic condition often resistant to treatment. It is characterized by itchy, scaly, raised, silvery-red patches.

- Denorex
- Tegrin
- Neutrogena T-Gel

**Systemic Drugs for Psoriasis - (Systemic means pertaining to or affecting the whole body):**

methotrexate (Rheumatrex) - methotrexate is a well-known chemotherapy drug that inhibits DNA, slowing down the reproduction of rapidly dividing cells, such as cancer cells.
**Topical Corticosteroids:** Steroid is a general term encompassing a number of hormones produced by the body. Corticosteroids comprise those produced by the adrenal gland. Topical corticosteroids are indicated to relieve contact dermatitis, poison ivy, insect bites, psoriasis, seborrhea, and eczema. Below is a list of OTC and prescription drugs (the ones with capital letters are trade names).

- Betamethasone (Temovate)
- Dexamethasone (Decadron)
- Hydrocortisone
- Methylprednisolone (Medrol)
- Triamcinolone (Aristocort, Kenalog)

**Topical Antibiotics:** Bacitracin - is only used topically because it can produce toxic effects when given systemically. It was developed from a strain of bacteria found growing in a culture of wound drainage named “Margaret Tracy.” The name bacitracin is a combination of the bacteria and the patient name: *Bacillus subtilis* and Tracy, for example.

- Gentamicin (Garamycin)
- Neomycin

**Over-The-Counter and Prescription Antifungal Drugs:** Fungal infections such as ringworm, athlete’s foot, jock itch, nail fungus, can be effectively treated with topical antifungal drugs.

- Desenex (OTC)
- Miconazole (OTC)
- Ketoconazole (Nizoral) prescription
- Ciclopirox (Loprox) prescription
- Nystatin (Mycostatin) prescription

**Oral Prescriptive Antifungal Drugs**
Amphotericin B (Fungizone)
Griseofulvin
*Fluconazole (Diflucan) - fluconazole is also a topical antyeast drug.

**Drugs Used to Treat Viral Infections of the Skin (Herpes, type I and II or 1 and 2) Herpes simplex virus type II** diseases involving the genital area, "sexually transmitted disease," or "STD." Herpes type I involves the mouth as “cold sores.”

Acyclovir (Zovirax) “most commonly prescribed”
Valacyclovir

►**Herpes Zoster** - The severe pain of herpes zoster virus infections, commonly known as “shingles” is treated topically, orally, or transdermally.

Acyclovir (Zovirax)
Capsaicin (Zostrix)

**Drugs to Treat Itching** – include both corticosteroids (discussed earlier) and antihistamines.

**Antihistamines** (inhibit inflammation, redness, and itching caused by an allergic reaction)

Benadryl
Doxepin
Caladryl

**INTERESTING FACTOID:**

The term “nit-picking,” meaning to point out and criticize tiny details, comes from the process of picking through the hair looking for lice eggs, which are called *nits.*
Miscellaneous Dermatologic Drugs

**Burrow’s solution:** Applied as a wet dressing to relieve superficial inflammation

**Desitin:** An OTC ointment for diaper rash

**Domeboro:** Trade name for Burow’s solution

**Calamine:** OTC lotion for poison ivy, insect bites, and sunburn

**Betadine:** A brown antibiotic solution used as a hand scrub prior to surgical procedures

**Hibiclens, Hibistat:** Antibacterial scrub and skin cleanser

**Minoxidil (Rogaine):** Used to treat male and female pattern baldness

**PHisoHex:** Antibacterial skin scrub

**Silver sulfadiazine (Silvadene):** An antibiotic used specifically for skin burns

ANOTHER FACTOID: (irresistible)

For thousands of years, men have smeared smelly stuff on their scalps in a vain attempt to beat back baldness. Cleopatra reportedly anointed Caesar with a concoction of bear grease, burned mice, deer marrow, and horse teeth. Other remedies have included pigeon droppings, horseradish, and buffalo dung. Minoxidil (Rogaine) was the first medicine scientifically shown to stimulate hair growth and was originally used for high blood pressure.
2. UROLOGY

Urinary tract drugs include diuretics (used to treat hypertension), urinary tract infection antibiotics, and other anti-infection drugs. Potassium supplements are taken concurrently with many diuretics to counteract their potassium-wasting effect.

Drugs used in treating the urinary tract include:

a. **Diuretics** - “Thiazide” diuretics (hypertension), using the ending -iazide, common to generic thiazide diuretics.

   Hydrochlorothiazide (HCTZ)
   Chlorothiazide (Diuril)

b. **Loop diuretics** (loop="within the kidney"). Loop diuretics act at the site of the proximal and distal tubules as well as the “loop of Henle” (anatomic term), hence the name, *loop*.

   Furosemide (Lasix)
   Ethacrynic acid

c. **Potassium supplements** - Potassium supplements are frequently prescribed for patients taking thiazides and loop diuretics to avoid potassium depletion. *NOTE:* The presence of K in every trade name refers to the chemical symbol for potassium, “K.” When you hear or see “prescribed K,” it means *potassium*.

   Kay Ciel
   K-Dur
   Slow-K
   K-Lyte
   K-Tab

d. **Urinary tract infections** (UTIs) - are often treated with oral antibiotics and are particularly effective against gram-negative *E. coli* (bacteria).
Nalidixic acid (NegGram) - The trade name NegGram was selected because the drug is effective against gram-negative bacteria (remember the gram positive and gram negative characterization).

Nitrofurantoin (Furadantin, Macrobid, Macrodantin)
Sulfonamides (a group of antibacterials using sulfa)
Sulfamethoxazole (Gantanol)
Sulfisoxazole (Gantrisin)

e. Benign prostatic hypertrophy (BPH)

Proscar

f. Combination urinary tract drugs - may be combined in various ways

Azo-Gantanol (Pyridium) (combines sulfamethoxazole and Pyridium)
Azo-Gantrisin
Bactrim
Pyridium
Septra

3. GASTROENTEROLOGY

Gastrointestinal drugs are prescribed to treat disease conditions of the stomach and intestines such as ulcers, diarrhea, inflammatory conditions, constipation, ulcerative colitis, irritable bowel syndrome (IBS), or gallstones.

a. Peptic ulcer

A peptic ulcer is an ulcer located anywhere in the esophagus, stomach, or duodenum. A gastric ulcer is located in the stomach. All peptic ulcers are caused by irritation of the mucous membrane of the gastrointestinal tract from hypersecretion of hydrochloric acid and the subsequent action of pepsin, which digests protein. Aspirin, nonsteroidal anti-inflammatory drugs (NSAIDS), alcohol, and caffeine
also irritate the mucous membrane and can contribute to ulcer formation. The following are some of the drugs used to treat ulcers.

**Antacids**

Milk of Magnesia (MOM)
Amphojel
Chooze
Mylanta
Rolaids
Tums
Alka-Seltzer (contains sodium)
Bromo-Seltzer (contains sodium)

**Antacids with simethicone** - contain an additional ingredient to relieve flatulence (gas).
Di-Gel
Gelusil
Maalox Plus
Mylanta
Gas-X

**H2 blockers**
cimetidine (Tagamet)
Pepcid
Zantac

**H. pylori infection** - *Helicobacter pylori* is a helical or curved bacterium with *flagella*. It lives in the gastric or duodenal mucosa and is the cause of most peptic ulcers.

amoxicillin (Amoxil)
tetracycline (Achromycin)
Flagyl

b. **Gastroesophageal reflux** - Gastroesophageal reflux disease (GERD) occurs when the stomach acid reflexes, or flows back into the esophagus, causing irritation and pain.

Propulsid
Reglan and Maxolon

c. **Gastrointestinal (GI) spasm** - Intestinal conditions such as irritable bowel syndrome (IBS), spastic colon, diverticulitis, and even ulcers can be accompanied by abdominal pain due to spasms. These spasms can be relieved by a category of drugs known as *anticholinergics*, which decrease spasms by slowing peristalsis.
Anticholinergics
Valpin
Banthine
Anaspaz
Bentyl

d. Diarrhea

Lomotil (contains narcotic)
Tincture of opium (paregoric)
Pantopon (contains narcotic)
Imodium (non-narcotic)

e. Over-the-Counter Drugs (OTC)

Donnagel
kaolin
Kaopectate

f. Laxatives

Epsom salts (contains magnesium)
MOM (milk of magnesia)
Senokot
Ex-Lax
Dulcolax
Metamucil
FiberCon

g. Stool softeners - Stool softeners are emulsifiers that allow water and fat in the stool to mix, thus softening hard stool.

docusate sodium (Colace)
docusate calcium (Surfak)

h. Bowel preps/enemas

Colyte
Nulytely
Fleet enema
GoLYTELY

i. Ulcerative colitis – Various drugs are used for this within these listings.
j. **Antiemetics** - Antiemetic drugs are used to control nausea and vomiting that arise from bacteria, viral illnesses of the GI tract, surgery, motion sickness, vertigo, radiation and chemotherapy.

- chlorpromazine (Thorazine)
- promethazine (Phenergan)
- Compazine
- Tigan
- Dramamine (motion sickness)
- Benadryl
- scopolamine transdermal patch (motion sickness)

k. **Chemotherapy drugs**

- cisplatin (Platinol)
- Cytoxan
- doxorubicin (Adriamycin)
- nitrogen mustard (patch)
- Reglan
- Zofran

l. **Miscellaneous GI drugs** - Activated charcoal (administered via nasogastric tube for suicidal attempts and accidental overdoses), syrup of ipecac (induces vomiting), an over-the-counter drug used to treat ingestion of poisonous substances.

4. **MUSCULOSKELETAL**

Orthopedic conditions such as arthritis (rheumatoid and osteoarthritis), bursitis, tendinitis, gout, and muscle spasms are treated with painkillers, e.g., aspirin, and NSAIDS, gold salts, and skeletal muscle relaxants, among others.

a. **Drugs for arthritis and osteoporosis** - The oldest known drug used to treat arthritis is aspirin. Aspirin is also known as *acetylsalicylic* acid (ASA). It has anti-inflammatory, analgesic, and antipyretic actions. **NOTE**: Tylenol is an analgesic and antipyretic, like aspirin, but is not an anti-inflammatory. It is not indicated for rheumatoid arthritis because it is not an anti-inflammatory. Because acetylsalicylic acid aspirin can cause stomach irritations, some drugs are created to dissolve in the duodenum or intestine, thus bypassing the stomach, and have an enteric-coating that permits that process. The salicylic class is termed a *keratolytic* drug.

- Aspirin
- Disalcid
- Bayer Aspirin
b. **Nonsteroidal anti-inflammatory drugs (NSAIDS) for arthritis**

Ibuprofen (Motrin, Advil, Nuprin)
Indomethacin (Indocin)
Naproxen sodium (Anaprox, Naprosyn)
Daypro

**ANOTHER INTERESTING FACTOID:** Indocin (indomethacin) is given IV to premature infants who have persistent fetal circulatory pattern with *patent ductus arteriosus* (heart).

c. **Corticosteroids**

betamethasone
cortisone
dexamethasone (Decadron)
hydrocortisone
prednisolone
prednisone
triamcinolone (Artisocort, Kenalog)

d. **Gold salts** - Gold salts are used to treat active rheumatoid arthritis, which is an autoimmune disease. Gold salts contain 29% to 50% of the total drug.

Ridaura

e. **Estrogen replacement therapy for osteoporosis** - Estrogen can be taken orally or administered through a transdermal patch.

Estradiol (Estrace, Estraderm)
Conjugated estrogens (Premarin)

f. **Skeletal muscle relaxants** - Musculoskeletal relaxants (MSR) specifically relieve muscle spasm and stiffness. Some of these drugs have sedative qualities.

Soma
Parafon Forte
Flexeril
Diazepam (Valium)
Robaxin

g. **Drugs for gout** - Gout is caused by a defect of metabolism that results in increased amounts of uric acid in the blood.

Allopurinol (Zyloprim)
Colchicine

h. **Miscellaneous musculoskeletal (MS) drugs** Capsaicin (Zostrix) (family of Capsicum or red peppers): Applied topically to prevent pain signals from reaching the central nervous system.

5. **CARDIOVASCULAR**

Cardiovascular drugs are used to treat a variety of conditions, including congestive heart failure (CHF), angina pectoris, arrhythmias, hypertension, and hyperlipidemia. The various problems will be listed and the drugs for that particular problem.

a. **Congestive Heart Failure (CHF)**

Congestive heart failure occurs when the heart muscle is weakened and unable to adequately pump blood. Cardiac glycosides are a group of chemically related drugs prescribed for congestive heart failure. In ancient times, cardiac glycosides were extracted from dried foxglove plants (Digitalis lanata). Today, these drugs are extracted and purified synthetically. The term *digitalis* refers collectively to all of the cardiac glycosides. Two such drugs are:

- digitoxin
- digoxin (Lanoxin)

Digitalis toxicity from cardiac glycosides is a serious and frequent adverse effect. Nearly one-third of patients taking cardiac glycoside develop symptoms of digitalis toxicity. To prevent toxic effects, physicians order blood tests to determine the level of digitalis in the blood. These are often referred to as “dig levels.” Symptoms may be treated in one of three ways.

1. Decreasing the dosage of the cardiac glycoside
2. Changing the dosage of the cardiac glycoside to a less frequent schedule
3. In severe cases, administering a drug such as the one listed below inactivate cardiac glycoside in the bloodstream.
   - digoxin immune fab
b. **Angiotensin-Converting Enzyme (ACE) inhibitors treat congestive heart failure.**

ACE inhibitors decrease blood pressure, pulmonary vascular and peripheral resistance as well as heart size.

- captopril (Capoten)
- enalapril (Vasotec)
- lisinopril (Prinivil, Zestril)
- quinapril (Accupril)


c. **Angina and Myocardial Infarction (MI)**

The pain of angina pectoris occurs when cells of the myocardium receive insufficient oxygenated blood to meet their needs. The drugs used to treat angina pectoris include nitrates, beta-blockers, and calcium channel blockers. Nitrates used to treat angina include nitroglycerin, the most frequently prescribed drug. All of these nitrates, including nitroglycerin, can be administered in several different ways. These include:

- sublingually, "s.l."
- transmucosally between the cheek and gum, "p.o."
- orally as a sustained-release capsule or tablet, "p.o."
- transdermally as a patch, "patch"
- topically as an ointment, "topical"
- intravenously, "IV"

**Drugs:**
- Nitro-Bid
- Nitro-Dur
- Nitrostat
- Transderm-Nitro patch


d. **Beta-blockers (angina pectoris)**

Beta-blockers act to decrease the heart rate which in turn decreases the need of the myocardium for oxygen, decreasing anginal pain. For patients who have a myocardial infarction (MI), the beta-blocker, Inderal, is the most commonly prescribed to prevent a second heart attack.

- atenolol (Tenormin)
- Lopressor
- Inderal
e. **Calcium Channel Blockers (CCB) (angina)**

Calcium channel blockers may be used in conjunction with nitrates and beta-blockers to treat angina. Calcium channel blockers relax the smooth muscle of the blood vessels to decrease arterial pressure.

- diltiazem (Cardizem)
- verapamil
- nifedipine (Procardia)

f. **Antiarrhythmic problems (rhythm disorders)**

Certain arrhythmias are caused by abnormalities in the normal conduction of electrical impulses from the SA (sinoatrial node) through the AV (atrioventricular node), bundle of His (anatomic word for atrioventricular bundle), and Purkinje system (look it up) of the heart.

- flecainide (Tambocor)
- quinidine (Quinaglute, Quinidex)
- lidocaine (Xylocaine)
- Norpace
- procainamide (Pronestyl, Procan SR)

g. **Antihypertensives (high blood pressure)**

Several types of antihypertensive drugs are available, so many, in fact, we won’t list them here. Those below may include the ACE inhibitors for hypertension.

- Clonidine (Catapres)*
- Lotensin
- captopril (Capoten)
- enalapril (Vasotec)
- lisinopril (Zestril)
- Accupril

**FACTOID**

The hypertensive drug clonidine (Catapres) is also used to relieve the symptoms of nicotine withdrawal in patients who have quit smoking.
h. **Vascular crisis drugs, e.g., myocardial infarction, (MI)**

When cellular ischemia associated with angina pectoris is not treated, it may progress to cellular death, termed “myocardial infarction,” or in layman’s terms, “heart attack.” Some of the drugs used to treat MIs are:

- Captopril (Capoten)
- Lisinopril (Prinivil, Zestril)
- Quinapril (Accupril)

**FACTOID**

The most commonly used medication to help prevent a second myocardial infarction is aspirin.

i. **Hyperlipidemia drugs**

- Lipitor
- Lescol
- Mevacor
- Zocor

j. **Miscellaneous drugs**

- Prostaglandin – produces vasodilation and relaxation of the smooth muscle
- Dipyridamole (Persantine) – this drug is no longer used for angina, but is primarily given to patients who have coronary artery disease, but cannot tolerate an exercise stress test

k. **Anticoagulants** - act to stop clot formation by inhibiting one or several clotting factors:

- Heparin – most commonly prescribed
- Warfarin sodium (Coumadin) - most commonly prescribed
- Warfarin potassium (Athrombin-K)
- Dicumarol

l. **Platelet Aggregating Inhibitors (PAI)**

These drugs act by preventing platelets from clumping (aggregating) to form a clot. In the event a clot has already formed, thrombolytic drugs are used.
Aspirin
Dipyridamole (Persantine)
Ticlid

m. **Thrombolytics**

Anticoagulant drugs are not effective in dissolving clots that *have already formed*. Instead, tissue activators and thrombolytic enzymes are used to lyse (cut) the thrombi (clots).

Streptokinase
Urokinase

n. **Miscellaneous anticoagulant and thrombolytic drugs:**

Cryoprecipitate - used to reduce elevated platelet count

Protamine sulfate – bound with heparin, this drug is used to treat heparin overdose or reverse the therapeutic effects of heparin administered during surgery for cardiac bypass

Vitamin K - a coagulant used to restore normal blood clotting time

---

6. **PULMONOLOGY**

Respiratory diseases such as asthma, chronic obstructive pulmonary disease (COPD) and emphysema require medication to treat chronic symptoms as well as prevent or assist in acute attacks. Aside from antibiotics used to treat respiratory infections, there are several classes of drugs prescribed to treat pulmonary diseases.

a. **Bronchodilators**

This class of drugs is used to treat asthma, chronic obstructive pulmonary disease (COPD), and exercise-induced bronchospasm. Bronchodilators relax the smooth muscles that surround the bronchi, thereby increasing airflow. Bronchodilators are given (1) orally, (2) intravenously, (3) as a solution or powder in a dispenser and used as an inhaler with a special mouthpiece. The prescribed dosage for these meter-dose inhalers is in the number of puffs.

**Administered through inhalers or ingested orally**
Albuterol (Proventil).
Epinephrine (Adrenalin)
Atrovent
Terbutaline (Brethaire)
Isuprel
Aminophylline
Alupent
Theophylline (relaxes smooth muscle around bronchi)

**Intravenous**
Aminophylline
Epinephrine (Adrenalin)
Theophylline
Isuprel

**Note:** Terbutaline under the trade name *Bricanyl* is also given to stop premature labor contractions by stimulating the beta-2 receptors in the uterine smooth muscle, thus providing relaxation.

b. **Corticosteroids**

This group of drugs are either produced naturally by the adrenal gland or given through an inhaler in prescribed puffs. The effect of corticosteroids is to suppress the inflammatory response of the immune system.

Beclomethasone (Beclovent, Vanceril)
Dexamethasone (Decadron)
Triamcinolone (Azmacort)

c. **Drugs used to treat tuberculosis**

Tuberculosis is caused by *Mycobacterium tuberculosis*, a gram-positive rod that is resistant to antibiotics that are usually effective against gram-positive bacteria.

Ciprofloxacin (Cipro)
Ethambutol
Rifampin
Streptomycin

d. **Drugs used to treat Legionnaire’s disease**

Legionnaire’s disease, a serious and sometimes fatal lobar pneumonia, is caused by *Legionella pneumophila*. It was named for its first recorded recognized outbreak in 1976 at an American Legion convention in Philadelphia. This gram-negative bacteria grew in standing water in the air conditioning system and was distributed through the hotel by ventilation ducts.
Zithromax (azithromycin)
Rifampin
Levofloxacin

e. **Drugs used to stop smoking**

Clonidine
Zyban

f. **Miscellaneous pulmonary drugs**

This natural surfactant is derived from ground-up cow lung and is used to supplement low levels of natural surfactant in the lungs of premature infants suffering from respiratory distress syndrome (RDS).

g. **Diuretics** – used to treat pulmonary edema

h. **Tine test** - a screening test for tuberculosis that uses a 4-pronged applicator

7. **EAR, NOSE AND THROAT (ENT)**

ENT drugs include decongestants, antihistamines, mast cell inhibitors, corticosteroids, topicals, antitussive drugs, expectorants, and antifungals.

a. **Decongestants**

Decongestants act as vasoconstrictors to reduce blood flow to edematous tissues in the nose, sinuses and pharynx. They achieve vasoconstriction by stimulating the alpha receptors in these tissues. They also reduce swelling of the mucous membranes, alleviate nasal stuffiness, allow secretions to drain, and help open compressed eustachian tubes in the ears.

Ephedrine
Afrin, Dristan, Sinex.
Neo-Synephrine
Pseudoephedrine (Drixoral, Sudafed)

b. **Antihistamines**
Antihistamines help to dry up secretions, and they block the histamine at the H1 receptor level. Antihistamines are only effective in treating allergic reactions, which release histamines; they are not effective in treating the common cold.

Benadryl
Claritin
Seldane
Hismanal

c. **Mast Cell Inhibitors (MCI)**

These inhibitors act to stabilize the membrane of mast cells and prevent them from releasing histamine. This prevents edema of the nasal passages in patients with allergic rhinitis.

Cromolyn (Nasalcrom)

d. **Corticosteroids**

In addition to traditional uses, some of these products may be applied topically (skin, mouth)

Beclomethasone (Beconase, Vancenase)
Dexamethasone (Decadron)
Triamcinolone (Nasacort)

e. **Topical**

Triamcinolone (Kenalog in Orabase)

f. **Antitussives**

Antitussive drugs act to decrease coughing by suppressing the cough center in the brain.

Codeine
Tessalon Perles
Hycodan

g. **Expectorants**

Expectorants act to reduce the viscosity or thickness of sputum so that it can be coughed up (expectorated) more readily. Expectorants are prescribed only for *productive* coughs (those which actually produce phlegm).

Robitussin (most commonly prescribed)

h. **Antifungals**
Candida albicans or oral candidiasis, formerly called monilia and sometimes called thrush are fungal infections of the mouth. Antifungal drugs are applied topically as a solution (the patient is told to “swish and swallow”). They also may be prescribed as a troche (trosch) or a lozenge to suck.

Mycelex
Nizoral
Nystatin

i. **Combination ENT Drugs**

Chloraseptic: Topical anesthetic throat spray

Cocaine: Topical anesthetic and vasoconstrictor used during ENT examinations and operations on the nose

Silver nitrate: Cauterizing agent on an applicator stick used to cauterize superficial blood vessels causing nosebleeds, and present in newborn eyedrops

### 8. **OPHTHALMOLOGY**

Ophthalmic drugs may be applied topically to treat superficial infection or inflammation of the cornea, surrounding tissues, and to treat glaucoma. Other ophthalmic drugs are taken systemically for severe infection. They include antibiotics, corticosteroids, antivirals, anesthetics, drugs used for glaucoma (reducing pressure), myotics or miotics (make the pupil contract), and mydriatics (make the pupil dilate).

a. **Antibiotics**

Antibiotics prevent bacteria from maintaining their cell wall. Antibiotics are not effective against viral infections. Ophthalmic antibiotics are dispensed as ointments or solutions. Topical antibiotics for the eye include:

Bacitracin
gentamicin
tobramycin (Tobrex)

Most states either recommend or require a topical anti-infective agent be applied to the eyes of newborn infants to prevent infection. The most common agent used for this purpose is:

Silver nitrate

b. **Corticosteroids**
Corticosteroid drugs are used topically in the eye to treat inflammation resulting from trauma, surgery, allergies, or contact with chemicals.

Dexamethasone (Decadron)
Prednisolone (Pred Forte)

c. **Antivirals**

Antiviral drugs act by inhibiting viral DNA reproduction. Topical antiviral drugs for the eyes that are effective against herpes simplex virus are:

Herplex
Trifluridine
d. **Glaucoma treatment**

Glaucoma is a disease with a presenting symptom of increased intraocular (into the eyeball) pressure. If untreated, it can lead to blindness. The drugs below were the first drugs developed for glaucoma but are used less often now.

Miochol
Miostat
Diamox
e. **Beta-blocker drugs**

These are also used to treat glaucoma. They block the production of aqueous humor in order to decrease the intraocular pressure:

Betoptic
Ocupress
Timoptic
f. **Mydriatics**

Mydriatics are used to dilate the pupil (mydriasis) and paralyze the muscles of accommodation (cycloplegia).

Atropine
Scopolamine
Mydriacyl
Neo-Synephrine
g. **Miscellaneous**

BSS: An abbreviation for balanced salt solution – is commonly used during eye surgery to irrigate and protect the eye.

Fluorescein: A yellow water-based dye that shows green under fluorescent light. This drug is used to point out corneal abrasions and ulcers caused by foreign bodies or ill-fitting contact lenses.

9. **ENDOCRINOLOGY**

We will discuss the pharmacy products used in this specialty with the type of endocrine problem.

a. **Diabetes mellitus**

This disorder in the functional process results when the pancreas fails to produce sufficient insulin. When no insulin is produced, it is called Type I diabetes mellitus, and insulin-dependent (IDD). Type II (noninsulin dependent - NIDD) is characterized by a gradual onset with minimal or no symptoms of metabolic disturbance. Type II patients use both antidiabetic drugs and in some cases, insulin. Type I is almost always treated with subcutaneously injected insulin.

1. **Insulin**

This substance is secreted by beta cells in the islets of Langerhans located in the pancreas. This hormone plays an essential role in sugar metabolism.

Traditionally, insulin has been derived from beef or pork pancreas. Human insulin is genetically produced using recombinant DNA techniques; this avoids the potential for allergic reactions. The trade name for all human genetically produced insulin is Humulin. Several categories of insulin are noted, and grouped by how rapidly they act in the system.

- **Rapid-Acting insulins**: Regular Humulin – Regular Iletin, Novolin R
- **Intermediate Acting**: NPH Iletin, Lente L, Humulin L
- **Long-Acting**: Ultralente, Humulin U
- **Mixtures of NPH and regular insulin**: Humulin 50/50, Humulin 70/30, Novolin 70/30
2. **Oral antidiabetics**

A patient with type II diabetes mellitus has a pancreas that still secretes some insulin in limited amounts. With diet control and weight loss, the amount of insulin may be sufficient. If not, an oral antidiabetic drug may be prescribed. Contrary to popular opinion, these drugs are not insulin and are not effective in patients with Type I diabetes mellitus.

- Diabinese
- Glucotrol
- DiaBeta
- Micronase
- Tolinase
- Orinase
- Glucophage

b. **Diabetes insipidus**

The pituitary gland secretes *vasopressin*, which inhibits the excretion of water by the kidneys. A lack of or insufficient ADH (antidiuretic hormone) results in diabetes insipidus. To counteract that problem, vasopressin, (ADH), is used.

Vasopressin (Pitressin)

c. **Thyroid Gland**

The thyroid gland may be either over- or underactive. You will recall that the related medical prefixes are hyper- and hypothyroid.

1. **Hypothyroid**

The enzymes released by the thyroid hormones are termed *T3* and *T4*. This listing contains both T3 and T4 compounds. The products used to treat hypothyroidism are obtained from either natural sources such as desiccated ground beef or pork thyroid gland, or they are synthetically manufactured.

- Desiccated thyroid
- Euthroid
- T4 only = levothyroxine (Synthroid)
- Levoxyl (levothyroxine)

2. **Hyperthyroid**

This family of drugs inhibits the production of T3 and T4 in the thyroid gland.
Propylthiouracil
Tapazole
Radioactive sodium iodide 131

d. Pituitary gland

The pituitary gland secretes hormones, one of which is the growth hormone. Decreased levels of that hormone inhibit skeletal growth in children.

Somatropin

10. OBSTETRICS AND GYNECOLOGY

Drugs used to treat women with obstetric and gynecologic problems include drugs for infertility and vaginal infections, drugs that stimulate or suppress labor contractions, drugs that correct disorders, hormone replacement therapy, and prophylactically prescribed birth-control agents.

Drugs to treat infertility
Drugs for premature labor and inducing labor
Postpartum bleeding drugs
Drugs for endometriosis
Estrogen replacement therapy (ERT)
Drugs for dysmenorrhea
Drugs for vaginal infections
Drugs for sexually transmitted diseases (STD)
Miscellaneous drugs

Infertility

Infertility drugs act by stimulating the pituitary gland to release luteinizing hormone (LH) and follicle-stimulating hormone (FSH), which help the ovary prepare and release mature eggs. These drugs also aid in the formation of corpus luteum, which secretes progesterone to maintain the pregnancy if the ovum is fertilized.

clophiphene (Clomid, Serophene)
progesterone - used in conjunction with other treatments for infertility

Premature Labor

Premature delivery greatly increases morbidity and mortality in infants. Premature contractions can be inhibited by using uterine-relaxing drugs that act on beta-receptors in the smooth muscle of the uterus.

ritodrine
terbutaline (Bricanyl)

**Labor Induction**

Women in labor may be given a uterine stimulant, if uterine contractions are too weak to effect delivery (uterine inertia) or if complications such as pre-eclampsia or diabetes necessitate labor induction. Oxytocin as a drug, increases both the frequency and strength of uterine contractions, and can be used as a labor stimulant.

oxytocin (Pitocin)

**Postpartum Hemorrhage**

Postpartum bleeding is due to uterine relaxation, which results in increased bleeding at the site of placental separation.

oxytocin (Pitocin)
Methergine

**Endometriosis**

Endometriosis is caused by uterine tissue that implants within the pelvic cavity and onto the ovaries and other organs. Endometriosis continues to remain sensitive to hormonal influence, secreting blood when the uterus begins menstruation. Endometriosis may cause pelvic inflammatory disease (PID), pelvic pain, and cyst formation.

estrogen/progesterone (Enovid, Premphase, Prempro).

**Hormone Replacement Therapy (HRT)**

Premarin
Estratab, Estrace
estradiol
estrogen/progesterone (Premphase, Prempro)

**Dysmenorrhea**

Painful menstrual cramps are caused by an increase in prostaglandins, which cause the uterus to contract painfully.

ibuprofen (Motrin)
Naproxen (Naprosyn)
Midol
Pamprin
**Vaginal Infections**

Most drugs used to treat vaginal infections are applied topically and are dispensed in the form of cream/ointments, suppositories, or vaginal tablets. *Candidal* infections are caused by *Candida albicans*, a yeast.

- Femstat
- Gyne-Lotrimin
- Mycelex
- Monistat
- Vagistat

*Gardnerella vaginalis* is a gram-negative rod. Drugs used to treat these infections are applied vaginally, except for ampicillin and include the following:

- amoxicillin
- ampicillin
- penicillin
- tetracycline
- ciprofloxacin (Cipro)

**Pelvic Inflammatory Disease (PID)**

Pelvic inflammatory disease involves widespread inflammation, scarring, and pain in the pelvic cavity. It is caused by sexually transmitted diseases (STDs) as well as several other bacterial agents, and is treated systemically with antibiotics.

- Doxycycline (Vibramycin)

**Sexually Transmitted Diseases (STDs)**

- Amoxicillin
- Ampicillin
- Penicillin
- Cipro
- Tetracycline

*Syphilis* - caused by the gram-negative spirochete, *Treponema pallidum*. Drugs used to treat this disease include:

- Penicillin (Pen-VK)

**Chlamydial infections**
Zithromax
Doxycycline

**Trichomonas infections**

Flagyl

**Herpes Simplex** - Herpes simplex virus type 2 attacks the genital area. The lesions are treated topically or with oral drugs that act systemically.

Acyclovir (Zovirax)
Penciclovir

**Miscellaneous**

Hyskon: This fluid is used intraoperatively to distend the uterine cavity and facilitate visualization with a hysteroscope.

RhoGAM: Is an immunoglobulin which suppresses the immune response in an Rh-negative woman who has delivered an Rh-positive baby.

11. **NEUROLOGY**

a. **Epilepsy**

A common neurologic problem is epilepsy (ictus). See your dictionary for the various types. An epileptic seizure originates in the brain when a group of neurons spontaneously begins to send out impulses in an abnormal, uncontrolled manner. The following drugs are used to treat the different forms of epilepsy.

Phenobarbital (Luminal)
Zarontin
Tegretol
Neurontin
Valproic acid (Depakote)

Four common types of seizures prevail. The type of epileptic drug used depends upon the type of seizure.

1. Tonic-clonic (grand mal)
2. Absence (petit mal)
3. Complex partial (psychomotor)
4. Simple partial (focal motor)
   - Tonic-Clonic Seizures

   Tegretol
   Luminal
   Dilantin – the drug most often prescribed for adults
   Mysoline
   Phenobarbital – the drug most often prescribed for children

   - Absence Seizures

   Zarontin – drug most commonly used
   Klonopin
   valproic acid (Depakote)

   - Complex partial seizures

   Tegretol
   Tranxene
   Neurontin
   Dilantin
   Valproic acid (Depakote)

   - Other seizures

   Librium (also prescribed to prevent alcoholic detoxification seizing)

   - Status epilepticus

   Status epilepticus is a state of prolonged seizure activity or frequent seizures.
   Valium (diazepam)
   Ativan (lorazepam)
   Luminal (phenobarbital)
   Dilantin

b. Parkinson’s Disease

The symptoms of Parkinson’s disease were first described in 1817 by the English physician, James Parkinson, ergo, the name. Parkinson’s disease is a chronic, degenerative condition affecting the brain. Its early symptoms, first appearing usually in adults of later middle age, include muscle rigidity, tremors and a slowing of voluntary movements. Parkinson’s follows a progressively downhill clinical course.
Symmetrel
Parlodel
L-dopa (levodopa)
Cogentin
Artane
Cinemet-10/100, 25/100, or 25/250 (combination drug)

c. **Alzheimer’s Disease**

Dementia associated with Alzheimer’s disease is associated with low levels of acetylcholine in the cortex of the brain. This occurs because of the concomitant destruction of neurons.

Cognex
Hydergine

d. **Insomnia**

Drugs used to induce sleep are termed *hypnotics* from the Greek word *hypnos* “sleep.” They are classified into three groups, nonbarbiturate, barbiturate and over-the-counter.

**Nonbarbiturate Hypnotics**

- Placidyl
- Dalmane (most commonly prescribed)
- Doriden
- Restoril
- Halcion
- Ambien

Over-the-Counter sleep aids - OTC sleep aids commonly contain the antihistamine, diphenhydramine and cause drowsiness.

- Excedrin P.M.
- Sominex
- Tylenol P.M.
- Unisom

**Barbiturate Hypnotics**

- Butisol
- Nembutal
- Seconal
e. **Attention Deficit Disorder (ADD/ADHD)**

Hyperactive children exhibit extreme symptoms of restlessness, short attention span, distractibility, labile emotions, and impulsive or disruptive behavior.

Amphetamine  
Dexedrine  
Ritalin  
Concerta

f. **Miscellaneous**

Paraldehyde: A sedative/hypnotic used to decrease agitation and promote sedation and sleep in patients undergoing alcohol withdrawal.
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ANSWERS - 11

1. Greek
2. Latin
3. 2000 BC
   a. foxglove
   b. rose hips
   c. willow bark
   d. or any of those listed Under Modern Drugs Derived from Natural Sources
4. metric
5. a- g or gm
   b- mcg
   c- kg
   d- mEq
   e- mL
6. a- a.c.
   b- q.d.
   c- t.i.d.
   d- p.c.
7. Pedialyte 15 mg/20 kg/t.i.d.
8. chemical name
9. the trade name with a registered trademark
10. trade name
11. oxazepam
12. tablet, capsule, cream, liquid, suppository, transdermal substance
13. any five - oral (p.o.), sublingual, vaginal/rectal, transdermal, inhalation, parenteral, intradermal, subcutaneous (sub-q or subq), intramuscular (IM), intravenous (IV), endotracheal (ET), intrathecal (IT), topical
14. analgesics (pain killers)
15. applied to the skin or mucous membrane