hospital
iii. Published yearly

b. *Physician's Desk Reference* (PDR)
i. Published by a private firm
ii. Drug manufacturers pay to have their products listed
iii. Useful reference with several indexes to identify drugs
iv. List precautions, warnings about side effects and information about the recommended dosage and administration of each drug
v. Published yearly

XI. Administration of Drugs

a. Route
i. How the drug is taken into the body
ii. Determines how well it is absorbed into the blood
iii. Determines the speed and duration of action of the drug
iv. Oral Administration
1. Given by mouth
2. Slowly absorbed into the bloodstream through the stomach or intestines
3. Convenient for the patient
4. Disadvantages include:
a. May be destroyed in the digestive tract
b. If unable to pass through the intestinal wall, it will be ineffective
c. Slow to act
v. Sublingual Administration
1. Placed under the tongue
2. Dissolves in the saliva
3. Rapid absorption
vi. Rectal Administration
1. Suppositories and aqueous solutions are inserted into the rectum
2. Used when oral administration is difficult
vii. Parenteral Administration
1. Injection of a drug from a syringe through a hollow needle
2. There are several types of Parenteral injections and instillation
a. Intracavity instillation: injection into a body cavity
b. Intradermal injection: shallow injection made into the upper layers of the skin
c. Subcutaneous Injection (SC)
i. Small needle is introduced into the subcutaneous tissue
ii. Usually on the upper arm, thigh or abdomen

d. Intramuscular injection
    i. Used for large volume of solution injections
    ii. Buttock or upper arm is the usual site for IM injections
e. Intrathecal instillation: injection in the space under the membranes surrounding the spinal cord and brain
f. Intravenous injection (IV)
    i. Injection given directly into a vein
    ii. Used when an immediate effect is desired
g. Pumps
    i. Battery-powered pumps may be used for continuous administration of drugs by SC or IV
h. Inhalation
    i. Gases taken into the nose or mouth
    ii. Absorbed into the bloodstream through the thin walls of air sacs in the lungs
    iii. Aerosols
        1. Particles of drug suspended in air
        2. Administered by inhalation
i. Topical application
    i. Drugs applied locally on the skin or mucous membranes
        1. Antipruitics (against itching)
        2. Antiseptics (Against infection)
        3. Transdermal patches
            a. Hormone replacement therapy
            b. Pain meds
            c. Many others

XII. Vehicles for drug administration
- a. Hypodermic syringes
- b. Ampule
    - i. Small glass or plastic container containing a single dose of drug
- c. Vial
    - i. Glass container with a metal-enclosed rubber seal
- d. Capsules: small soluble containers used for a dose of medication for swallowing
- e. Tablets: small solid pills containing a dose of medication
- f. Caplets: coated like a capsule, but solid like a tablet

XIII. Drug Actions and Interactions
    a. Receptor
        i. The target substance with which the drug interacts to produce its effects
        ii. Drug may cross the cell membrane to reach it's intracellular receptor
        iii. Drug may react with a receptor on the cell's surface
    b. Dose
        i. Amount of drug administered
        ii. Usually measured in milligrams or grams
    c. Schedule
        i. Exact timing and frequency of drug administration
    d. Additive Action
        i. The combination of two similar drugs is equal to the sum of the effects of each
        ii. Example: if drug A kills 10% of the infection and drug B kills 20% of the infection, then using A and B together would kill 30% of the infection
    e. Synergism
        i. Response
            1. Desired and beneficial effect of a drug
    f. Tolerance
        i. Effects of a given dose diminish as treatment continues
        ii. Increasing amounts are needed to produce the same effect
    g. Addiction
        i. Physical and psychological dependence on and craving for a drug
        ii. Presence of clear unpleasant effects when the drug is withdrawn
    h. Controlled substances
        i. Drugs that produce tolerance and dependence
        ii. Have potential for abuse or addiction
        iii. Class (Schedule) I: most dangerous drugs that have no recognized medicinal use
        iv. Class (Schedule) II: dangerous substance with general medical indications and high potential for abuse and addiction
        v. Class (Schedule) III: carries less potential for abuse, but casual use can lead to psychological addiction and dependence
        vi. Class (Schedule) IV: carries low potential for abuse but a risk of psychological or limited physical dependence
        vii. Class (Schedule) V: least dangerous drugs
XIV. Drug Toxicity
    a. The poisonous and potentially dangerous effects of some drugs

b. Idiosyncrasy
    i. An example of an unpredictable type of drug toxicity
    ii. Unexpected effect that appears in the patient after administration of a drug
c. Iatrogenic
    i. Produced by treatment
    ii. Mistakes in drug use
    iii. Due to unrecognized individual sensitivity to a certain agent
d. Side effects
    i. Toxic effects that result routinely result from the use of a drug
    ii. Often occur with the usual therapeutic dosage of a drug
    iii. Generally tolerable or acceptable
e. Contraindications
    i. Factors in a patient's condition that make the use of a drug dangerous
    ii. Reason's not to use the drug in question

XV. Classes of Drugs
a. Analgesics: alges/=sensitivity to pain
    i. Drug that lessens pain
    ii. Mild
    iii. Narcotic
    iv. Nonsteroidal Anti-inflammatory drugs (NSAIDs)
b. Anesthetics
    i. Agent that reduces or eliminates sensation
        1. General anesthetic
        2. Local anesthetic
c. Antibiotics
    i. A chemical substance produced by a microorganism: bacterium, yeast, or mold
    ii. Vagina: moniliasis or candidiasis
d. Antiviral
    i. Used against infections due to viruses
        1. Herpes viruses
        2. Epstein-Barr virus
        3. Cytomegalovirus
        4. HIV
e. Anticoagulants
    i. Prevent clotting of blood
    ii. Prevent formation of clots or breakup clots in blood vessels
        1. Heparin: a natural anticoagulant
        2. Warfarin (Coumadin); manufactured; blocks vitamin K
        3. Tissue-type plasminogen activator (tPS) dissolves clots

f. Antiplatelet drugs
    i. Reduce the tendency of platelets to stick together
        1. Aspirin (ASA)
        2. Plavix
g. Anticonvulsants
    i. Prevents or reduces the frequency of convulsions in some types of epilepsy
    ii. Depresses abnormal spontaneous activity of the brain, without affecting normal brain function
h. Antidepressants
    i. Treat symptoms of depression
    ii. Elevate mood and increase physical activity
    iii. Increase mental alertness
    iv. Improve appetite and sleep patterns
i. Anti-Alzheimer drugs
    i. Used to treat symptoms of Alzheimer disease
    ii. Act by aiding brain neurotransmitters
j. Antidiabetic drugs
    i. Used to treat diabetes mellitus
    ii. Insulin
    iii. Insulin pump
    iv. Oral antidiabetic drugs
k. Antihistamines
    i. Drugs that block the action of histamine
        1. Histamine causes allergic symptoms (Hives, bronchial asthma , hay fever)
    ii. Cannot cure the allergic reaction; only relieves its symptoms
    iii. Many have strong antiemetic qualities (used to prevent nausea)
l. Antiosteoporosis Drugs
    i. Used to treat osteoporosis (bone loss)
m. Cardiovascular Drugs
    i. Act on the heart or blood vessels to treat a variety of conditions; hypertension, angina, MI, CHF and others
    ii. Some help the heart to beat more effectively
    iii. Angiotensive-converting enzyme (ACE)
        1. Dilate blood vessels to lower blood pressure, improve the performance of the heart and reduce its workload
    iv. Angiotensive II receptor blockers (ARBs)
        1. Lower blood pressure by preventing angiotensive from acting on receptors in blood vessels
    v. Antiarrhythmics
        1. Reverse abnormal heart rhythms
        2. Slow the response of heart muscle to nervous system stimulation

3. Slow the rate the nervous system impulses are carried through the heart

vi. Beta-blockers
   1. Decrease muscular tone in blood vessels
   2. Decrease output of the heart
   3. Decrease blood pressure

vii. Calcium channel blockers
   1. Dilate blood vessels
   2. Lowers blood pressure
   3. Used to treat angina and arrhythmias

viii. Cholesterol-binding drugs
   1. Bind to dietary cholesterol and prevent its uptake from the GI track

ix. Cholesterol-lowering drugs (statins)
   1. Used to control high levels of cholesterol in the blood
   2. Lowers cholesterol by reducing its production in the liver

x. Diuretics
   1. Reduce the volume of blood in the body by promoting the kidneys to remove water and salt through urine
   2. Used to treat hypertension and CHF

n. Endocrine Drugs
   i. Androgens: normally made by the testes and adrenal glands
      1. Used for male hormone replacement
      2. Used to treat endometriosis and anemia
   ii. Antiandrogens: interfere with the production of androgens or interfere with their binding in tissues
      1. Used to treat prostate cancer
   iii. Estrogens: female hormones normally produced by the ovaries
      1. Used for symptoms associated with menopause and postmenopausal osteoporosis
   iv. Aromatase inhibitors
      1. Reduce the amount of estrogen in the blood
      2. Are effective against breast cancer
   v. Selective estrogen receptor modulator (SERM)
      1. Has estrogen-like effects on bone and on lipid metabolism
      2. Used to treat postmenopausal osteoporosis and breast cancer
   vi. Thyroid hormone: used to treat low output of hormone from the thyroid gland
      1. Calcitonin: used to treat osteoporosis
      2. Glucocorticoids help reduction of inflammation as

well as arthritis, skin allergic conditions, GI ailments, and malignant conditions

vii. Parathyroid hormone (PTH)
    1. Used to treat osteoporosis
    2. Stimulates new bone formation

viii. Growth hormone release-inhibiting factor
    1. Can be manufactured and given to treat GI symptoms associated with acromegaly and other tumors
    2. Inhibits the production of natural growth hormone

o. Gastrointestinal Drugs
    i. Antacids
        1. Neutralize the hydrochloric acid in the stomach
        2. Used to relieve symptoms of peptic ulcer, esophagitis and reflux
    ii. Antiulcer Drugs
        1. Blocks secretion of acid by cells in the lining of the stomach
        2. Used to treat gastric and duodenal ulcers and Gastroesophageal reflux disease (GERD)
    iii. Antidiarrheal medications
        1. Relieve diarrhea and diminishes colon peristalsis
    iv. Cathartics: relieve constipation and promote defecation
        1. Laxatives: mild cathartics
        2. Purgatives: strong cathartics

p. Respiratory Drugs
    i. Bronchodilators
        1. Open bronchial tubes
        2. Administered by injection or aerosol inhalers
    ii. Steroid drugs: reduce chronic inflammation in respiratory passageways
    iii. Leukotriene modifiers: prevent asthma attacks

q. Sedative-Hypnotics
    i. Used to treat insomnia and sleep disorders
    ii. Depress the CNS and promote drowsiness (sedatives) and sleep (Hypnotics)
    iii. Barbiturates and benzodiazepines are two major categories of sedative-hypnotics

r. Stimulants
    i. Act on the brain to speed up vital processes (heart and respirations)
    ii. Increase alertness and inhibit hyperactive behavior
    iii. Amphetamines: used to prevent narcolepsy (seizures of sleep), suppresses appetite and calms hyperkinetic children
    iv. Caffeine: cerebral stimulant: used to treat headaches

s. Tranquilizers

i. Useful for controlling anxiety
ii. Benzodiazepines: minor tranquilizers
iii. Phenothiazines
iv. Major tranquilizers

XVI. Vocabulary

Term	Meaning
addiction	Physical and psychological dependence on and craving for a drug
additive action	Drug action in which the combination of two similar drugs is equal to the sum of the effects of each
aerosol	Particles of drug suspended in air
anaphylaxis	Exaggerated hypersensitivity reaction to a previously encountered drug or foreign protein
antagonistic action	Combination of two drugs gives less than an additive effect (action)
antidote	Agent given to counteract an unwanted effect of a drug
brand name	Commercial name for a drug; trademark or trade name
chemical name	Chemical formula for a drug
contraindications	Factors that prevent the use of a drug or treatment
controlled substances	Drugs that produce tolerance and dependence and have a potential for abuse or addiction
dependence	Prolonged use of a drug that may lead to physiologic need for its actions in the body
dose	Amount of drug administrated, usually measured in milligrams
food and drug administration (FDA)	U.S government agency having the legal responsibility for enforcing proper drug manufacture and clinical use
generic name	Legal noncommercial name of a drug
iatrogenic	Condition caused by treatment (drug or procedures) given by physicians or medical personnel
idiosyncratic reaction	Unexpected effect produced in particularly sensitive patient but not seen in most people
inhalation	Administration of drugs in gaseous or vapor from through the nose of mouth
medicinal chemistry	study of new drugs synthesis; relationship between chemical structure and biological effects
molecular pharmacology	Study of interaction of drugs and their target molecules such as enzymes, or cell surface receptors
oral administration	Drugs given by mouth

parenteral administration	Drugs are given by injection into the skin, muscles, or veins (any route other than the digestive tract). Examples are subcutaneous, Intradermal, intramuscular, intravenous, intrathecal, and intracavity injections
pharmacist	Specialist in preparing and dispensing drugs
pharmacy	Location for preparing and dispensing drugs. Also the study of preparing and dispensing drugs
pharmacodynamics	Study of the effects and strengths of a drug within the body
pharmacokinetics	Study of drug concentrations in tissues and body fluids over a period of time.
Pharmacologist	Specialists who develop and test drugs for medicinal use.
Pharmacology	Study of the preparation, properties, uses and actions of drugs.
Physician's Desk Reference	(PDR) Reference book that lists drug products
Receptor	Target substance with which a drug interacts in the body
Rectal administration	Drugs are inserted through the anus into the rectum
Resistance	Lack of beneficial response
Response	Desired and beneficial effect of a drug
Schedule	Exact timing and frequency of drug administration
Side effect	Adverse reaction, usually minor, that routinely results from the use of a drug
Sublingual administration	Drugs are given by placement under the tongue
Synergism	Combination of two drugs causes an effect that is greater than the sum of the individual effects of each drug alone
Syringe	Instrument for introducing or withdrawing fluids from the body
Tolerance	Larger and larger drug doses must be given to achieve the desired effect
Topical application	Drugs are applied locally on the skin or mucous membranes of the body (ointments, creams, lotions)
Toxicity	Harmful effects of a drug
Toxicology	Study of the harmful chemicals and their effects on the body
Transport	Movement of a drug across a cell membrane into body cells
United States Pharmacopeia	Authoritative list of drugs, formulas and preparations that sets a standard for drug

PHARMACOLOGY WORKSHEET

Combining Forms

Combining Form	Meaning
aer/o	
alges/o	
bronch/o	
chem./o	
cras/o	
cutane/o	
derm/o	
erg/o	
esthes/o	
hist/o	
hypn/o	
iatr/o	
lingu/o	
myc/o	
narc/o	
or/o	
pharmacy/o	
prurit/o	
thec/o	
pyret/o	
tox/o	
toxic/o	
vas/o	
ven/o	
vit/o	

Prefixes

Prefix	Meaning
Ana-	
Anti-	

Abbreviations

Abbreviation	Meaning
a.c., ac	
ACE	
ad lib	
APAP	
ARB	
b.i.d., bid	
c̄	
Caps	
Cc	
FDA	

gm, g	
gtt	
h	
h.s., hs	
H_2 blocker	
HRT	
IM	
INH	
IV	
MAOI	
mg	
mil, ml	
NPO	
NASID	
$\overline{p}$	
p.c., pc	
PCA	
PDR	
PO, p.o., po	
p.r.n., prn	
Pt	
q	
q.h., qh	
q2h	
q.i.d., qid	
q.s., qs	
qAM	
qPM	
Rx	
$\overline{s}$	
SERM	
Sig.	
SL	
s.o.s.	
SSRI	
SQ	
tab	
TCA	
t.i.d., tid	

Pharmacology-Classes of Drugs and Related Terms

Term	Meaning
ACE inhibitor	
amphetamine	
analgesic	
androgen	
anesthetic	
angiotensin II receptor blocker	
antacid	
antiandrogen	
antiarrhythmic	
antibiotic	
anticoagulant	
anticonvulsant	
antidepressant	
antidiabetic	
antidiarrheal	
antiemetic	
antihistamine	
antinauseant	
antiplatelet	
antiulcer	
antiviral	
aromatase inhibitor	
bactericidal	
bacteriostatic	
beta-blocker	
bisphosphonate	
caffeine	

calcium channel blocker	
cardiac glycoside	
cardiovascular drug	
cathartic	
cholesterol-binding drug	
cholesterol-lowering drug	
diuretic	
emetic	
endocrine drug	
gastrointestinal drug	
glucocorticoid	
hypnotic	
laxative	
narcotic	
progestin	
purgative	
respiratory drug	
sedative	
stimulant	
thyroid hormone	
tranquilizer	