FUNDAMENTALS

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1. **Vital signs**
    a. **Temperature:** 36.5-37.7 C, 96.8-99.9 F
        i. **Hypothermia:** <96.8
        ii. **Hyperthermia (fever):** >100.4
    b. **HR:** 60-100
    c. **RR:** 12-20
    d. **BP:** 120/80
    e. **SaO2:** >95%
2. **Lab values**
    a. **Sodium:** 135-145 mEq/L
    b. **Potassium:** 3.5-5.0 mEq/L
    c. **Total Calcium:** 9.0-11 mg/dL (**Ca**ll **9-11**)
    d. **Magnesium:** 1.5-2.0 mg/dL
    e. **Phosphorus:** 3.0 –4.5 mg/dL
    f. **BUN:** 10-20 mg/dL
    g. **Creatinine:** 0.7-1.4 mg/dL
    h. **Glucose:** 70 -110 mg/dL
    i. **HbA1c:** <7%
        i. **Normal:** <5.7%
        ii. **Prediabetes:** >5.7% – <6%
        iii. **Diabetes:** >6.5%
    j. **AST** 0-35 units/L
    k. **ALT** 4-36 units/L
    l. **Albumin:** 3.5-5.5 g/dL
    m. **Total cholesterol** < 200 mg/dL
    n. **HDL**: Male > 45 mg/dL, women > 55 mg/dL
    o. **LDL** < 130 mg/dL
    p. **WBC** 5,000-10,000/mm^3
    q. **RBC:** 4.5-5.0
    r. **Hemoglobin**: 12-18
        i. **Blood transfusion needed:** <8
    s. **Hematocrit**: Male 42-52%, Female 37-47%
    t. **Platelet** 150,000-400,000/mm^3
    u. **pH** 7.35-7.45
    v. **pC02** 35 to 45 mm Hg
        i. **Acidic**: >45
        ii. **Alkalotic**: <35

w. **HCO3** 22-26 mmol/L
x. **p02** 80-100 mmHg
y. ***Normal PT = 11-12.5 sec, Normal INR = 0.7-1.8 (Therapeutic INR 2-3)***
    i. *Normal* PT = 11-12.5
    ii. PT on Coumadin should be 2-3x higher
    iii. INR of 3.9 means it is 3.9x higher than normal person
z. ***Normal PTT = 30-40 sec (Therapeutic PTT 1.5 – 2 x normal or control values) 60-80 seconds***
    i. PTT on heparin should be 1.5-2x higher
aa. **Digoxin** 0.5 to 2.0 ng/mL
bb. **Lithium** 0.8 to 1.4 mEq/L
cc. **Dilantin** 10-20 mcg/mL
dd. **Theophylline** 10 to 20 mcg/mL

3. **Latex allergies**
    a. Note that clients allergic to bananas, apricots, cherries, grapes, kiwis, passion fruit, avocados, chestnuts, tomatoes, and/or peaches may experience latex allergies as well
4. **Order of assessment** → Inspection, palpation, percussion, auscultation
    a. Except with abdomen it is **IAPP**-inspect, auscultate, percuss and palpate.
5. **Cane walking** → COAL (Cane, Opposite, Affected, Leg)
6. **Crutch walking** → Remember the phase "step up" when picturing a person going up stairs with crutches. The good leg goes up first followed by the crutches and the bad leg. The opposite happens going down the stairs….OR "up to heaven…down to hell"
7. **3 point gait** → Allows pt to be mobile without bearing weight on affected extremity
    a. Used when pt is non-weight bearing on a leg
8. **Delegation** → RNs DO NOT delegate what they can EAT (Evaluate, Assess, Teach)
    a. A nursing assistant can perform tasks such as taking vital signs, range of motion exercises, bathing, bed making, obtaining urine specimens, enemas and blood glucose monitoring. Nursing assistants cannot interpret results or perform any task beyond the skill level of the certification they received.
        i. **Performing gastrostomy feeding thru an established gastrostomy tube**
    b. The PN is managed under the supervision of the RN. Certain higher level skills can be delegated after competency has been established by the RN (e.g., dressing changes or suctioning).
9. **Medical asepsis** is "clean technique" and **surgical asepsis** is sterile technique
10. Isolation Precautions
    a. **AIRBORNE** → "Air on MTV
        i. Measles, TB, Varicella (chicken pox)
        ii. Management → Neg pressure room, private room, mask, n95 for TB
    b. **DROPLET** → SPIDERMAn
        i. Sepsis, scarlet fever, strep, pertussis, pneumonia, parvovirus, influenza, diphtheria, epiglottitis, rubella, mumps, adenovirus
        ii. Management → private room, mask
    c. **CONTACT** → MRS WEE

    i. MRSA, VRSA, RSV, skin infection (herpes zoster, cutaneous diphtheria, impetigo, pediculosis, scabies, and staphylococcus), wound infections, enteric infection (C diff), eye infections (conjunctivitis)
    ii. Management → gown, gloves, goggles, private room
11. **Venturi mask** (4-10L/min) is the most precise O2 delivery. Best for pt w/ chronic lung disease (i.e. **COPD**)
12. **Aerosol mask/Face tent** good for pt w/ facial trauma or burns
13. Dysphagia is difficulty swallowing; Dysphasia is difficulty speaking
    a. **Dysphagia** → Aspiration precautions; Avoid thin liquids and sticky food and provide oral care prior to eating (helps to enhance taste of food)
14. Home oxygen education → **Avoid synthetic or wool fabrics** (encourage wearing cotton)
    a. Educate to apply a water-soluble lubricant to soothe irritation of the mucous membranes
15. **Incentive Spirometer use** → Instruct pt to keep a tight mouth seal around mouthpiece and to **inhale and hold breath for 3-5 secs**
16. **Restraints** → Assess and document pt physical needs, safety and comfort q 15-30 mins
    a. **Renew of prescription** → Adults - q4h, 9-17 y/o - q2h, under 9 y/o - q1h
    b. Staff member must remain continuously w/ pt or view the pt via camera
17. **Trendelenburg position** (legs in the air) → Used to promote venous circulation
18. Arterial disorder → Place legs in a dependent position)
19. Venous disorder → Elevate legs
    a. Make a v with your 2 fingers (the 2 fingers being the legs) to help remember care for pt with arterial vs venous disorder

PHARMACOLOGY GUIDE

ANTAGONISTS

Agonists → Drugs that allow the body's neurotransmitters, hormones, and other regulators to perform the jobs they are supposed to perform (i.e. **Morphine sulfate** is an opioid agonist that works on mu receptor)

Antagonists → Prevent the body from performing a function that it would normally perform (i.e. **Narcan**)

- I.e. Narcan

ANTIDOTES

1. Muscarinic agonists, cholinesterase inhibitors → Bethanechol, Neostigine
    a. Atropine
2. Anticholinergic drugs (Atropine) → Phyosostigmine
3. Digoxin, digitoxin → Digibind
4. Warfarin (Coumadin) → Vitamin K
5. Heparin → Protamine sulfate
6. Insulin-induced hypoglycemia → Glucagon
7. Acetaminophen (Tylenol) → Acetylcysteine

ELECTROLYTE REPLACEMENTS

ELECTROLYTE	INFORMATION REGARDING SUPPLEMENTS
Sodium → 135-145 mEq/L • Major electrolyte in extracellular fluid	Administer isotonic IV therapy of 0.9% normal saline or Ringer's lactate **Hyponatremia** → ↑HR, ↓BP, confusion, fatigue, N/V, headache **Hypernatremia** → ↑HR, muscle twitching/weakness, GI upset
Potassium → 3.5-5.0 mEq/L • Essential for maintaining electrical excitability of muscle, conduction of nerve impulses, and regulation of acid/base balance *Kayexalate for hyperK	• Potassium chloride (K-Dur) • Oral or IV administration • NEVER give IV push to avoid fatal hyperkalemia • Dilute potassium and give no more than 40 mEq/L per IV to prevent irritation of vein • Administer no faster than 10 mEq/L per IV • Concurrent use with potassium-sparing diuretics or ACE inhibitors can cause hyperkalemia **Hypokalemia** → Dysrhythmias, muscle weakness/cramps, constipation/ileus, hypotension, weak pulse

	Hyperkalemia → dysrhythmias, muscle weakness, numbness/tingling, diarrhea
Calcium → 9.0-10.5 mEq/L • Essential for normal musculoskeletal, neurological, and cardiovascular function	• Calcium citrate (Citrical) • Calcium carbonate or calcium acetate • Implement seizure precautions during administration and have emergency equipment on hand **Hypocalcemia** → +Chvostek's & Trousseau's signs, muscle spasms, numbness/tingling in lips/fingers, GI upset, ↓BP, ↓HR **Hypercalcemia** → ↓ DTR, kidney stones, lethargy, constipation
Magnesium → 1.3-2.1 mEq/L • Regulates skeletal muscle contraction and blood coagulation	• Magnesium sulfate • Magnesium gluconate or magnesium hydroxide • Monitor BP, pulse and respirations with IV administration • Decreased/absent deep tendon reflexes indicates toxicity • Have injectable calcium gluconate on hand to counteract toxicity when giving magnesium sulfate via IV **Hypomagnesemia** → Hyperactive DTR, tetany, seizures, constipation/ileus **Hypermagnesemia** → ↓BP, muscle weakness, lethargy, respiratory/cardiac arrest
Bicarbonate → 7.35-7.45 • Maintains blood pH to prevent metabolic acidosis	• Sodium bicarbonate • Given orally as an antacid or via IV • Numerous incompatibilities with IV form

ANXIETY MEDICATIONS

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1. **Benzodiazepines** - **Alprazolam** (xanax) → antidote is flumazenil
2. **Atypical anxiolytics** - **Buspirone** (BuSpar) → Used for anxiety, panic disorder, OCD, PTSD
    a. S/E include dizziness, nausea (take w/ meals to decrease), headache
    b. NO SEDATION. Dependency is **NOT** likely so long-term use is ok. Full effect not felt for several wks

ANXIETY AND DEPRESSION MEDICATIONS

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1. **SSRIs** (selective serotonin reuptake inhibitors) - inhibits serotonin reuptake (↑ serotonin)
    a. Citalopram (Celexa), Sertra**line** (Zoloft), Fluoxe**tine** (Prozac), Paroxe**tine** (Paxil)
        i. End in "ine" so think of how its stressful to have a teen in the house - these meds are used for anxiety and depression
    b. Pt education → Avoid **st. john's wort**. Ensure a healthy diet
    c. S/E include insomnia (paroxetine), nausea, fatigue, sexual dysfunction, wt gain
    d. Watch for serotonin syndrome!! S/S → agitation, hallucinations, fever, diaphoresis, tremors
    e. Full effects not felt for up to a month

DEPRESSION MEDICATIONS

1. **Atypical antidepressants** → **Bupropion** (Wellbutrin), **Trazodone**
    a. Used for depression and as an aid to quit smoking (be APPROPRIATE and don't smoke)
    b. Common S/E - appetite suppression, wt loss, GI distress, agitation, seizure, headache
    c. Headache and dry mouth may be severe and pt should notify provider if this occurs
    d. Avoid use in pt w/ seizure disorders
2. **TCAs (Tricyclic Antidepressants)** → **Amitriptyline** (Elavil)
    a. **AMY TRIPPED OVER A TRICYCLE IN THE DESERT** (amitriptyline is a tricyclic antidepressant)
        i. In the desert → main S/E are **anticholinergic** (**everything dries up**)
            1. Urinary retention, constipation, dry mouth, blur vision, photophobia, tachycardia - MOST SERIOUS IS **URINARY RETENTION**
    b. S/E include **sedation, sweating, seizures** (all start with S)
    c. Indication - depression, neuropathy, fibromyalgia, anxiety, insomnia
    d. Watch for Anticholinergic effects and orthostatic hypotension
3. **MAOIs (Monoamine Oxidase Inhibitors)** → **Phenelzine** (Nardil) - used for depression
    a. **AVOID TYRAMINE FOOD INGESTION** - may cause **hypertensive crisis**
        i. Aged cheese, cheeseburgers, avocados, bananas, red wine, salami/pepperoni, chocolate
            1. Remember "MAOIs are a feen for aged cheese, avocadoes, etc)
    b. Interact with a bunch of drugs (if it's a choice, probably correct)
    c. S/E include agitation/anxiety, orthostatic hypotension, hTN crisis
4. **Serotonin-norepinephrine reuptake inhibitors (SNRIs)** → **Venlafaxine** (Effexor), **Duloxentine**
    a. Adverse effects include nausea, wt gain, and sexual dysfunction

BIPOLAR MEDICATIONS

1. **Mood stabilizers** - **Lithium** - indicated for bipolar disorder (KURT COBAIN 1.5)
    a. S/E include GI upset, fine hand tremors, polyuria, wt gain, kidney toxicity, electrolyte imbalanc
    b. **LITHIUM TOXICITY** is **1.5** mEq/L and above
        i. Sx → Coarse tremors, confusion, hypotension, seizures, tinnitus
    b. Fine hand tremors is expected, coarse hand tremors is sign of toxicity
    c. Avoid diuretics, anticholinergics, or NSAIDs (hard on kidneys)
    d. Adequate fluid and sodium intake!!!
5. **Antiepileptics** - **Carbamazepine** (Tegretol), **Valproic acid** (Depakote)
    a. Used for bipolar disorder AND as an anticonvulsant/AED
    b. **Carbamazepine** S/E - blood dyscrasias (anemia, leukopenia, thrombocytopenia -monitor CBC), vision issues (nystagmus, double vision), hypo-osmolarity, rash
    c. **Valproic acid** S/E - **HEPATOTOXICITY**, pancreatitis, thrombocytopenia, GI upset

OPIOID AND NICOTINE WITHDRAWAL MEDICATIONS

1. **Opioid withdrawal** → **methadone** (used for withdrawal and long-term maintenance
2. **Nicotine withdrawal** → **Bupropion** (Wellbutrin) which is also an atypical antidepressant
    a. Bupropion - remember be appropriate and don't smoke
3. Nicotine replacements include gum, patch, and nasal spray
4. **Varenicline** (Chantix) reduces cravings and withdrawal symptoms. Monitor for suicide and depression

ANTIPSYCHOTIC MEDICATIONS

Schizophrenia has both positive and negative symptoms

- **POSITIVE symptoms** - weren't there before dx (agitation, delusions, hallucinations)
- **NEGATIVE** - taken away from the pt (social withdrawal, lack of emotion, lack of energy, flatten affect)
- Conventional antipsychotics (1st generation) control positive symptoms
- Atypical controls positive and negative symptoms
- IM injections may be admin for non-compliant p was ts. Conventional q 2-4 w, atypical q2wk

1. Conventional (1st generation) - **xmazine** (Thorazine), **haloperidol** (Haldol)
    a. Indications → Schizophrenia, psychotic disorders
    b. **Extrapyramidal (EPS)**→ dystonia, Parkinson's symp, akathisia, tardive dyskinesia)
        i. Drooling, tremors, rigidity, unable to stand still, involuntary movement of face/tongue
        ii. May take anticholinergics to control EPS
    c. **Neuroleptic malignant syndrome (NMS)** → **Fever, dysrhythmias, muscle rigidity**
2. **Atypical** - **Risperidone** (Risperdal), **clozapine** (many end in -done or -pine)
    a. S/E → DM, wt gain, increased cholesterol (all kind of go together), orthostatic hypotension, anticholinergic effects
    b. Nursing considerations → **Initiate fall precautions**, monitor CBC and liver function

ALCOHOL ABUSE MEDICATIONS

Alcohol withdrawal: Starts within 4-12 hrs of last drink, peaks at 24-48hrs

1. **Meds during withdrawal**
    a. During withdrawal → Goal is to stable VS (↓ BP, HR, RR) and prevent seizures
    b. **Meds to decrease BP, HR, RR** - benzos (**chlordiazepoxide, diazepam, lorazepam**), antihypertensives (**clonidine, propranolol**)
    c. **Meds to prevent seizures** → AED (**carbamazepine**)
2. **Meds to promote abstinence**
    a. **Disulfiram** (Antabuse) → if pt ingests etoh, they will get many unpleasant S/E including N/V, sweating, palpitations, and hypotension
    b. **Naltrexone** (Vivitrol) → suppresses craving for etoh (available in **monthly IM injections**)
    c. **Acamprosate** (Campral) → ↓ abstinence symptoms (anxiety, restlessness)

NERVOUS SYSTEM MEDICATIONS

1. **Cholinergics** → **Neostigmine** (Prostigmin), **Pyridostigmine**, **Edrophonium**
    a. Indicated for myasthenia gravis (works to ↑ Ach at receptor sites by inhibiting cholinesterase)
        i. Remember that cholinesterase breaks down Ach (acetylcholine)
            1. STIG is a race car driver pulling up and stopping cholinesterase, which ↑ Ach
    b. S/E include excess Ach (remember anticholinergics are dry. Cholinergics are really wet)
        i. Increased salivation, N/V/D, sweating, bradycardia
    c. **Antidote is atropine**
    d. Administration → 45-60 mins before meals to prevent aspiration
2. **Dopamine Agonist** - **Levodopa/Carbidopa** (Sinemet) S/E → N/V, drowsiness, dyskinesias (tics), orthostatic hypotension, darkening of urine and sweat, psychosis
    a. Eat less protein (high protein meals decrease the effectiveness of med)
3. **Anticholinergic agent** - **Benztropine** (Cogentin) → indicated w/ parkinson's
    a. MOA is to **decrease Ach** in CNS → S/E include anticholinergic effects
4. **Antiepileptics** → **Phenytoin** (Dilantin)
    a. S/E - gingival hyperplasia, diplopia, nystagmus, rash, ataxia, hypotension
    b. Pt educaton → routine blood draws, and Decreases effectiveness of oral contraceptives
5. **Antiglaucoma agent (Topical beta blocker)** → **Timolol**
    a. Indicated for glaucoma (primarily open angle). Works by **decreasing IOP**
6. **Antiglaucoma agent (Carbonic anhydrase inhibitor)** → **Acetazolamide** (Diamox sequels)
    a. Indicated for glaucoma, HF, altitude sickness
    b. MOA - causes diuresis and lowers IOP. S/E include flulike symptoms, GI upset, electrolyte imbalance (Na and K) so need to monitor Na and K values
7. **Ear drops to treat otitis externa** → **Ciprofloxacin with Hydrocortisone** (Cipro HC)
    a. Roll container gently prior to admin (or gently shake suspension), keep on side for 5 mins after
        i. Lightly pack ear w/ cotton

8. **Neuromuscular Blocking Agent** → **Succinylcholine, Pancuronium** (both are trouble makers)
    a. MOA → blocks Ach, causing skeletal muscle paralysis
        i. **Succ is like suck it youre never gonna get to these Ach receptors**
        ii. **Pancur helps out and puts a pan over the Ach receptors to block them**
    b. Used as an adjunct to anesthesia in surgery or intubation procedures
    c. S/E include respiratory arrest, apnea, muscle pain after surgery (common)
    d. Monitor for **malignant hyperthermia** → sx are fever and muscle rigidity
        i. Tx → admin 100% O2, cooling measures, admin **dantrolene** (skeletal muscle relaxant)
9. **Muscle relaxants** → **Dantrolene** (dantrium) - monitor for **hepatotoxicity**
10. **Baclofen** → enhances GABA in CNS (watch for drowsiness)
11. **Urinary Tract stimulant** → **Bethanechol** ("***Remember that Beth has a bad bladder***")
    a. Used for non-obstructive urinary retention. Works by stimulating cholinergic receptors in GU tract
    b. S/E → **cholinergic symptoms** (flushing, sweating, urinary urgency, bradycardia, hypotension)
    c. Admin 1 hr before or 2 hr after meals to minimize N/V
12. **Urinary Tract Antispasmodic** → **Oxybutynin** (MOA → inhibits Ach in the bladder)
    a. Indication → Overactive bladder symptoms (frequency, urgency, nocturia)
    b. S/E → anticholinergic symptoms
13. **Insomnia medication** → **Zolpidem** (Ambien). Allow at least 8 hrs of sleep
14. **Sedative/Hypnotic** → **Pentobarbital, Propofol, Midazolam**
    a. Indication → induction and maintenance of anesthesia, conscious sedation, intubation
    b. **Propofol** S/E → pain at IV site, high risk of bacterial contamination

BRONCHODILATORS

Bronchodilators are **used to treat the symptoms of asthma** that result from inflammation of the bronchial passages, but THEY DO NOT TREAT THE INFLAMMATION. Therefore, most pt with asthma take an inhaled glucocorticoid concurrently to provide the best outcomes
→ 2 most common classes of bronchodilators are **beta2-adrenergic agonists** and **methylxanthines**

1. **Beta 2 Adrenergic Agonists** → **Albuterol** (short-acting), **Salmeterol** (Long-acting)
    a. Albuterol for ACUTE EPISODES!!! Like an asthma exacerbation
    b. Salmeterol for long-term control of asthma symptoms
    c. Albuterol S/E → tachycardia, angina, tremors (instruct pt to report chest pain, change in HR)
    d. Oral preperations can cause angina pectoris or tachydysrhythmias w/ excessive use
    e. Take beta 2 adrenergic agonist - wait 5 mins - take glucocorticoid
    f. **Metered-dose inhalers** → Wait at least 1 min between inhalations, clean the mouthpiece everyday w/ warm water and soap
2. **Methylxanthines** → **Theophylline** (used for long-term control of chronic asthma)
    a. **Theo - think you may see God soon if you take it** (S/E include fatal dysrhythmias, seizures)
    b. Nursing interventions → Monitor serum levels for toxicity (**>20 mcg/mL**)
        i. Mild toxicity - GI distress and restlessness, mod-severe toxicity - dysrhythmias, seizures
    c. Increased serum levels w/ **caffeine, cimetidine (Tagamet), and ciprofloxacin (Cipro)**
    d. Decreased serum levels w/ **Phenobarbital and Phenytoin**

RESPIRATORY MEDICATIONS: AIRFLOW DISORDERS

1. **Inhaled Anticholinergic** → **Ipratropium**
    a. MOA → Blocks Ach receptors in airway, causing bronchodilation, S/E → **dry mouth, hoarseness**
    b. Pt education → increase fluids, suck on sugar-free candy
2. **Inhaled Glucocorticoids** → **Beclomethasone**
    a. Indication → asthma (may be used alone or in conbo with a beta 2 adrenergic agonist)
    b. S/E → hoarseness, candidiasis (**RINSE MOUTH WITH WATER AFTER ADMIN**)
3. **Oral Glucocorticoid** → **Prednisone**
    a. S/E → bone loss, weight gain/fluid retention, hyperglycemia, hypokalemia, infection, muscle weakness, PUD, adrenal gland suppression
    b. Periods of stress may require additional doses, do not stop suddenly, avoid NSAIDs
4. **Leukotriene Modifier** → **Montelukast, Zafirlukast**
    a. Think **lukast** reduces effect of leukotrienes, which ↓ airway inflammation and bronchoconstriction
    b. Indications → asthama and prevention of exercise-induced bronchoconstriction
    c. Zafirlukast S/E → increase in liver enzymes (be sure to monitor LFTs)
    d. Pt education → take **montelukast** in evening or 2hr b4 exercise, avoid taking **zafirlukast** w/ food

RESPIRATORY MEDICATIONS: UPPER RESPIRATORY DISORDERS

1. **Antitussives: Opioids** → **Codeine**
    a. Indications → nonproductive cough (MOA is to **decrease cough reflex**)
    b. S/E → sedation, respiratory depression, constipation, GI upset, dependency
    c. Pt education → change position slowly, avoid etoh, ↑ fiber and fluid
2. **Expectorants** → **Guaifenesin** (Mucinex)
    a. Indications → nonproductive cough associated w/ respiratory infection
    b. MOA → reduces viscosity of secretions (thins secretions), **making cough more productive**
    c. Pt education → increase fluid intake to help liquefy secretions
3. **Mucolytics** → **Acetylcysteine**
    a. Indications → pulmonary disorders w/ thick mucous secretions (i.e. CF)
    b. Antidote for acetaminophen poisoning (think **acetylcysteine is for acetaminophen poisoning**)
    c. MOA → improves flow of secretions in respiratory tract
    d. S/E → N/V, rash, **bronchospasm** (use caution w/ asthmatics)
    e. Medication can smell like rotten eggs (expected finding)
4. **Decongestants** → **Phenylephrine, Pseudoephedrine**
    a. Indications → rhinitis (nasal congestion), MOA → vasoconstriction of resp tract mucosa
    b. S/E → agitation, nervousness, palpitations
    c. May cause **rebound congestion** from prolonged use (educate to limit use to 3 to 5 days)
5. **Antihistamines** → **Diphenhydramine** (1st gen), **Loratadine** (2nd gen)
    a. Indications → nasal congestion, mild allergic reactions, motion sickness
    b. Diphenhydramine S/E → sedation, anticholinergic effects
6. **Nasal Glucocorticoids** → **Mometasone, fluticasone, budesonide** (many end in -**one**)
    a. Indications → rhinitis (nasal congestion)
    b. S/E → headache, nasal burning, pharyngitis (sore throat)

MEDICATIONS AFFECTING URINARY OUTPUT

1. **Loop Diuretics** → **Furosemide** (Lasix)
    a. Indications → pulmonary edema, edema (RT HF, liver or kidney disease), HTN
    b. MOA → Blocks reabsorption of Na, Cl, and water (furosemide - think furious diuresis)
    c. S/E → dehydration, electrolyte imbalances (**hypokalemia, hyponatremia**), hypotension, ototoxicity, **hyperglycemia**
    d. Nursing interventions → infuse IV at 20 mg/min, weigh daily, I&O, monitor electrolytes
    e. Pt education → consume foods high in potassium (potatoes, bananas, dried fruits, nuts)
2. **Thiazide Diuretics** → **Hydrochlorothiazide**
    a. Indications → HTN, edema (RT HF, liver or kidney disease)
    b. S/E → dehydration, **hypokalemia**, **hyperglycemia**
    c. Nursing interventions → weigh daily, I&O, monitor electrolytes, encourage foods high in K
3. **Potassium Sparing Diuretics** → **Spironolactone**
    a. Indications → HF, HTN; **CONTRAINDICATED W/ SEVERE KIDNEY FAILURE**
    b. MOA → blocks aldosterone, promoting excretion of Na and water, but **retention of Potassium**
    c. S/E → **HYPERKALEMIA**, amenorrhea, gynecomastia, impotence
    d. Pt education → avoid salt substitutes containing potassium
4. **Osmotic Diuretics** → **Mannitol**
    a. Indications → edema, ↑ ICP, ↑ IOP (**Man I had a bad headache bc i had ↑ ICP but man it all went away when I took mannitol**)
    b. S/E → HF, pulmonary edema, renal failure, dehydration, electrolyte imbalances (Na, K)
    c. **Must use filter needle when drawing from the vial and filter in IV tubing**
        i. Prevents administering microscopic crystals

- Furosemide and Hydrochlorothiazide - monitor for HYPOkalemia
    - Nausea, vomiting, fatigue, leg cramps, and general weakness
- Spironolactone - monitor for HYPERkalemia → Weakness, fatigue, dyspnea, dysrhythmias
- Spironolactone - contraindicated w/ severe kidney disease!!!!
- Loop and thiazide diuretics ok even w/ severe kidney impairment
- **ALL DIURETICS** monitor wt, I&O, and electrolytes (**Sodium, Potassium**)

MEDICATIONS AFFECTING BLOOD PRESSURE

1. **ACE inhibitors** → **Captopril, lisinopril**
    a. Indications → HTN, HF, MI, diabetic nephropathy
    b. MOA → blocks ACE enzyme (functions to convert Angiotensin I to AII) which results in vasodilation, sodium and water excretion, and potassium retention
    c. S/E → **A**ngioedema, **C**ough, **E**levated potassium
        i. Others include hypotension, rash, dysgeusia (altered taste)
        ii. Angioedema is treated w/ epinephrine and symptoms will resolve once med is stopped
    d. Possible first dose orthostatic hypotension - educate pt to monitor BP for at least 2 hr after
    e. **Captopril** - educate pt to **take at least 1 hr before meals**; all other ACEs not affected by food
    f. **Captopril** may cause **neutropenia** (rare, but very serious). Educate on signs of infection
    g. Interactions
        i. Other BP meds - ↑ hypotension effect

ii. Potassium supplements or potassium sparing diuretics - ↑ risk of hyperkalemia
iii. Lithium - ↑ serum lithium levels (may lead to lithium toxicity)
iv. NSAIDs - can ↓ therapeutic effects of ACE inhibitors

2. **Angiotensin II Receptor Blockers** → **Losartan, Valsartan**
    a. Indications → HTN, HF, MI, diabetic nephropathy (same as ACEs)
    b. MOA → Blocks action of angiotensin II, resulting in vasodilation
    c. S/E → angioedema, GI upset, hypotension
3. **Aldosterone antagonists** → **Spironolactone**, Eplerenone
4. **Calcium Channel Blockers** - **Nifedipine, Amlodipine, Nicardipine, Felodipine**, **Verapamil, Diltiazem**
    a. Indications → HTN, angina
    b. MOA → blocks calcium channels in blood vessels and heart, leading to vasodilation and ↓ HR
    c. S/E → ↓ HR, ↓ BP, dysrhythmias, constipation, peripheral edema
    d. NO GRAPEFRUIT JUICE!!!

REVIEW OF ALPHA AND BETA RECEPTORS WHEN ACTIVATED (AGONISTS)
Alpha 1 = vasoconstriction (↑BP), Alpha 2 = vasodilation (↓ HR, BP)
Beta 1 = Tachycardia (helps to stimulate the heart), Beta 2 = Bronchodilation. **Remember 1 heart 2 lungs**

5. **Centrally Acting Alpha 2 Agonists** → **Clonidine** (Catapres)
    a. Indication → HTN
    b. MOA → ↓ sympathetic outflow to heart and blood vessels (↓ **HR, BP, CO**)
    c. S/E → drowsiness, dry mouth (educate pt to suck on hard candy and increase fluids)
6. Beta Adrenergic Blockers
    a. **Cardioselective: Beta 1** (affects only the heart) → **Metoprolol, Atenolol, Esmolol**
        i. Metoprolol S/E → erectile dysfunction
    b. **Non-selective: Beta 1 and Beta 2** (affecting both heart and lung) → **Propranolol, Nadolol**
        i. S/E → **bronchoconstriction** (**AVOID USE W/ ASTHMATICS**)
    c. **Alpha and Beta blockers** → **Carvedilol, Labetalol**
7. **Medications (Vasodilators) for Hypertensive Crisis** → **Nitroprusside** (Nitropress)
    a. MOA → Direct vasodilation of arteries and veins, rapidly decreasing BP (preload & afterload)
    b. S/E → **Cyanide poisoning, thiocyanate toxicity**

CARDIAC GLYCOSIDES AND HEART FAILURE MEDICATIONS

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1. **Cardiac Glycosides** → **Digoxin**
    a. Indications → HF, treatment of aFIB (dysrhythmias)
        i. *"Mom digya get a prescription for your HF? Yeah i got digoxin"*
    b. MOA → Positive inotropic effect (increased force and efficiency of heart contractions) and negative chronotropic effect (decreased HR)
    c. S/E → Dysrhythmias, bradycardia
    d. **Digoxin toxicity sx:** GI upset (N/V), fatigue/weakness, vision changes (normal level = 0.5-2.0)
        i. Hypokalemia → increases risk of dig toxicity
        ii. Antidote is **Digibind**
    e. **ALWAYS GET PULSE FOR FULL MINUTE PRIOR TO ADMIN** (treat bradycardia w/ Atropine)
2. **Adrenergic Agonists**

a. **Epinephrine** (Adrenaline) → used w/ cardiac arrest, asthma
    i. Causes bronchodilation, vasoconstriction (↑BP), and ↑HR and CO
    ii. Watch out for **chest pain** (epi ↑ cardiac workload and O2 demand, which can cause angina)
b. **Dopamine** (Inotropin) → used w/ shock and HF
    i. Improves renal blood flow (at low/moderate doses), ↑ HR/CO
c. **Dobutamine** → used w/ HF (↑CO - less effect on HR or BP)

ANTIDYSRHYTHMIC MEDICATIONS

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1. Class I → **Procainamide, Lidocaine**
    a. Indications → SVT, Vtach, aFlutter, aFIB
    b. S/E → hypotension, lupus, leukopenia, thrombocytopenia, arrhythmias
2. Class II → **Propranolol**
    a. Indications → aFib, Aflutter, paroxysmal SVT, HTN, angina
    b. S/E → hypotension, bradycardia, fatigue, weakness, bronchospasm (Avoid use w/ asthmatics)
        i. Watch for **coughing at night**
3. Class III → **Amiodarone**
    a. Indications → aFib, vFib, vTach
    b. Many serious S/E → hypotension, bradycardia, pulmonary toxicity, visual disturbances, GI upset, liver toxicity, thyroid dysfunction
    c. Monitor LFTs, and thyroid function
    d. Monitor for pulmonary toxicity (sx → **dyspnea, cough, and CP**). If observed - notify HCP
    e. Monitor for visual disturbances (**photophobia, blurred vision** - may lead to blindness)
4. Class IV → **Verapamil, diltiazem**
    a. Indications → aFib, aFlutter, SVT, HTN, angina
    b. S/E → hypotension, bradycardia, GI upset

ANTILIPEMIC AGENTS (All work to lower cholesterol)

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1. **Statins** → **Atorvastatin, simvastatin**
    a. MOA → decrease LDL, increase HDL (**also used to prevent MIs**)
    b. S/E → **hepatotoxicity, muscle pain, GI upset, rhabdomyolysis**
    c. Admin w/ evening meal (cholesterol is synthesized at night)
    d. Monitor LFT and CK, educate pt to avoid alcohol use
2. **Cholesterol Absorption Inhibitors** → **Ezetimibe** (Zetia)
    a. MOA → inhibits absorption of cholesterol in the small intestine (cholesterol zips thru, not absorb)
    b. S/E → hepatotoxicity, muscle pain (**cholesterol lowering agents - always consider the liver**)
    c. Monitor LFTs and CK level
3. **Bile Acid Sequestrant** → **Colesevelam**
    a. MOA → binds bile acids in intestine, causing increased excretion of cholesterol. Lowers LDL
    b. S/E → constipation
    c. Pt education → increase fiber and fluids, take w/ food and a full glass of water
    d. **Interferes w/ absorption of fat soluble vitamins (A, D, E, K) and oral contraceptives**
4. **Niacin**
    a. MOA → decreases lipoprotein and triglyceride synthesis (in large doses). Lowers LDL&triglycerides

b. S/E → **flushing of face**, GI distress, hepatotoxicity, **hyperglycemia**
c. Nursing interventions → monitor LFTs, monitor blood glucose

5. **Fibrates** → **Gemfibrozil**
   a. MOA → decreases triglyceride production and transport, increases HDL
   b. S/E → GI upset, **gallstones**, hepatotoxicity, muscle pain
   c. Nursing interventions → **admin 30 mins before breakfast and dinner**
   d. Monitor LFT and CK levels

VASODILATORS

DRUG CLASSIFICATION/NAME	IMPORTANT INFORMATION
Alpha Adrenergic Blockers • Prazosin • Doxazosin	• Dilate veins and arteries • Potential for 1st dose orthostatic hypotension • Concurrent use of prazosin & NSAIDs or clonidine can interfere w/ reduction of bP
Centrally Acting Alpha 2 Agonists • Clonidine • Guanfac **ine** HCl (Tenex) • Methyldopa (Aldomet)	• Vasodilation is result of CNS involvement • CNS involvement can cause sedation or drowsiness that should diminish with time • Concurrent use of clonidine and prazosin, MAOIs or tricyclic antidepressants can interfere with reduction of BP • Concurrent use with other CNS depressants can increase CNS depression
ACE inhibitors • Capto **pril** (Capoten) • Enala **pril** (Vasotec) • Fosino **pril** (Monopril) • Lisino **pril** (Prinivil) • Rami **pril** (Altace)	• Produce vasodilation by blocking production of angiotensin II • Should be stopped if client experiences cough, rash, altered taste, angioedema, or signs of infections • Can cause hyperkalemia so must monitor serum potassium levels • Concurrent use with potassium supplements or potassium-sparing diuretics can cause hyperkalemia • Concurrent use with lithium can lead to lithium toxicity
Angiotensin II Receptor Blockers • Lo **sartan** (Cozaar) • Val **sartan** (Diovan)	• Produce vasodilation by blocking the action of angiotensin II • Can cause angioedema • Fetal injury can result if used by pregnant women during 2nd and 3rd trimester
Calcium Channel Blockers	• Vasodilation is result of blocking of calcium channels in blood vessels

• Nife **dipine** (Adalat, Procardia) • Amlo **dipine** (Norvasc) • Felo **dipine** (Plendil) • Nicar **dipine** (Cardene) • Verapamil (Calan) • Diltiazem (Cardizem)	• Risk of reflex tachycardia, peripheral edema, and acute toxicity with nifedipine • Risk of orthostatic hypotension, peripheral edema, constipation, bradycardia, dysrhythmias, and acute toxicity with verapamil and diltiazem • Drinking grapefruit juice can lead to toxicity • Concurrent use of digoxin with verapamil can lead to digoxin toxicity
Meds for HTN crisis • Sodium nitroprusside • Labetalol (Trandate) • Diazoxide (Hyperstat) • Fenoldopam (Corlopam) • Trimethaphan (Arfonad)	• Provide direct vasodilation of veins and arteries & rapid reduction of BP • Cyanide poisoning can occur and lead to cardiac arrest • Thiocyanate poisoning can lead to altered mental status and psychotic behavior • Nitroprusside may be slightly brown, however solutions that are dark blue, red, or green should be discarded • Continuous BP & ECG monitoring when administering these drugs
Organic Nitrates • **Nitr** oglycerine (Nitrol, Nitrostat) • Isosorbide di **nitr** ate (Imdur)	• Dilates veins and prevents spasms of coronary arteries • Headache is common so client should use with acetaminophen or aspirin • Tolerance can occur with prolonged use • Concurrent use with sildenafil (Viagra) can lead to life-threatening hypotension • Use with alcohol can cause increased hypotension • Sublingual tablets, translingual spray, or transmucosal preparations should be used at the first sign of angina

MEDICATIONS AFFECTING COAGULATION

ALL OF THESE MEDICATIONS CREATE A RISK FOR BLEEDING;
What to monitor for → coffee ground emesis, black/tarry stools, petechiae, bruising, bleeding gums, tachycardia, hypotension, hematomas, abdominal pain, nose bleeds

1. **Parenteral Anticoagulants** → **Heparin**, **Enoxaparin** (Lovenox; LMWH), **Fondaparinux**
    a. Indications → CVA, PE, DVT (conditions requiring fast anticoagulation), prophylaxis post-op
    b. MOA → Prevents new clots from forming, **DOES NOT BREAK UP EXISTING CLOTS**
    c. Complications → Bleeding, heparin-induced thrombocytopenia (HIT), hypersensitivity
    d. **HIT** (heparin-induced thrombocytopenia) evidenced by low platelet count and increased development of thrombi
        i. **STOP HEPARIN IF PLATELET COUNT IS LESS THAN 100,000**
    e. Hemorrhage 2/2 heparin overdose → stop heparin, administer **protamine** and avoid ASA
    f. Monitor pTT and keep value 1.5-2x the baseline (normal pTT = 30-40s)
        i. **Therapeutic heparin pTT is normally 60-80s**
    g. **Protamine** is antidote. Admin for heparin or enoxaparin overdose
    h. Contraindications → low platelet count and active bleeding (bleeding disorders, ulcers)
    i. ASA, NSAIDs and other anticoagulants → increase risk for bleeding
    j. Must be given via sq or IV (meds cannot be absorbed by the intestinal tract)
    k. **Avoid corticosteroid use** (salicylates, NSAIDs), green leafy veggies, and foods high in vitK
2. **Oral Anticoagulants** → **Warfarin** (Coumadin)
    a. Indications → treatment of thrombus formation in pt w/ aFIB or prosthetic heart valves; prevention of MI, TIA, PE, DVT; treatment of venous thrombosis
    b. MOA → **Antagonizes vitamin K** (prevents formation of several clotting factors)
    c. S/E → bleeding, GI upset, **hepatitis**
    d. **Vitamin K** is the antidote; if this does not work → admin FFP or whole blood
        i. Educate pt to **maintain consistent intake of vit K** (dark green leafy veggies, lettuce, spinach, cabbage, broccoli, brussel sprouts, mayo, canola oil, soybean oil)
    e. Contraindications → PREGNANCY, thrombocytopenia, uncontrollable bleeding, vitamin K deficiencies, liver disorders, alcohol use disorder
    f. Full therapeutic effect not achieved for 3-5 days (may need to continue heparin infusion)
    g. Pt education → avoid sitting for prolonged time, constricting clothing; encourage elevating and moving legs when sitting
    h. **Avoid use of acetaminophen, glucocorticoids, ASA**
    i. **Normal PT** = 11-12.5s (warfarin pt should be 1.5-2x control)
    j. **Normal INR** = 0.7-1.8 (INR is most accurate)
        i. INR 2-3 → acute MI, aFIB, PE, venous thrombosis, tissue heart valves
        ii. INR 3-4.5 → mechanical heart valve or recurrent systemic embolism
    k. If PT or INR exceed therapeutic range → hold dose and notify provider
3. **Factor xa inhibitor** → **Rivaroxaban** (Xarelto); think "rivar" makes blood flow like a river
    a. Indication → prevention of DVT, PE, stroke in pts w/ aFIB
    b. S/E → elevated liver enzymes (monitor LFTs), bleeding (monitor Hgb and Hct)

4. **Antiplatelets** → **Aspirin, Abciximab, Clopidogrel** (Plavix)
    a. Indications → prevention of MI, CVA
    b. MOA → inhibit platelet aggregation
    c. S/E → GI upset (take with food), bleeding, tinnitus (**aspirin**)
    d. Key points → **DO NOT GIVE ASA TO CHILDREN W/ FEVER** (risk of Reys's syndrome)
    e. Corticosteroids ↑ ASA effects; ASA ↓ beta blockers effects on BP
5. **Thrombolytic Medications** → **Reteplase, Alteplase** (tPA); many end in -ase
    a. Indications → MI, CVA, PE, and occluded central IVs
        i. All meds treat acute MI; **Only Alteplase** treats PE, CVA, occluded central IVs
        ii. If unable to flush PICC line bc clot - can let thrombolytic dwell in there, then flush
    b. MOA → Dissolves clots that have already formed
        i. For PE → Medication should be taken within **3 hr of onset of symptoms**
            1. **USED FOR ISCHEMIC STROKE, and pulmonary embolism (PE)**
    c. Contraindicated → Hx: hemorrhagic stroke, internal bleeding, severe HTN, recent trauma/surgery
        i. Avoid use if pt underwent major surgical procedure in past 3 wks
    d. Nursing considerations → Limit venipunctures and IM injections (risk of bleeding)

GROWTH FACTORS

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1. **Erythropoietic Growth Factors** → **Epoetin alfa: Erythropoietin**
    a. Indications → **Anemia** (RT CKD, HIV/AIDS, chemotherapy)
    b. MOA → Act on the bone marrow to **increase production of RBCs**
    c. S/E → **HTN** (2/2 elevated Hct levels), ↑ risk of DVT, CVA, MI (esp of Hgb 11 or higher)
    d. Nursing considerations → Do not agitate vial
        i. Monitor for headache (may be RT HTN)
        ii. Monitor Hgb and Hct 2x per week, ensure sufficient iron levels
2. **Leukopoietic Growth Factors** → **Filgrastim**
    a. Indications → Neutropenia
    b. MOA → Act on the bone marrow to increase production of neutrophils
        i. ↑ neutrophils = ↓ **risk of infection in neutropenic pts** (RT chemotherapy)
    c. S/E → Bone pain, leukocytosis (high WBC levels), splenomegaly
    d. Key points → Do not agitate vial, monitor CBC 2x per week
3. **Thrombopoietic Growth Factors** → **Oprelvekin**
    a. Indications → Thrombocytopenia
    b. MOA → increase production of platelets (decreases thrombocytopenia and need for platelet transfusion in pt receiving chemo)
    c. S/E → Fluid retention, cardiac dysrhythmias (tachycardia, aFib, aflutter), eye effects
    d. Contraindicated → cancer of bone marrow

PEPTIC ULCER DISEASE MEDICATIONS

Peptic Ulcer Disease (PUD) → Characterized by an erosion of the mucosal layer of the stomach or duodenum
- Leading cause is **H. Pylori infection**; Other causes include chronic use of NSAIDs (ASA, ibuprofen)
- Pt w/ H. Pylori → Antibiotics used to eradicate the disease process; All other meds prescribed are used to promote healing of the GI tract

1. **Antibiotics** → **Amoxicillin, Bismuth, Clarithromycin, Metronidazole, Tetracycline, Tinidazole**
    a. Treatment will consist of **2 or 3 axb** for at least 14 days → Increase effectiveness and minimize development of medication resistance
    b. Used for eradication of H. Pylori bacteria
2. **Histamine2-Receptor Antagonists** → **Ranitidine, Cimetidine, Famotidine, Nizatidine** (end in -**dine**)

End in -dine, so think that when you take these **you will feel better when you DINE

    a. Indications → duodenal and gastric ulcers, GERD, Zollinger-Ellison syndrome
    b. MOA → Blocks H2 receptors in stomach (**reduces gastric acid secretion**, and lowers the concentration of hydrogen ions in the stomach)
    c. **↑ risk of bacterial colonization of stomach and respiratory tract** due to ↓ in gastric acidity
        i. Acid in the stomach helps to kill bacteria
        ii. Use caution in pts who are at high risk for PNA (i.e. COPD pt)
    d. Pt education → do not overeat, avoid foods that promote gastric acid secretion (i.e. caffeine), reduce stress, get adequate rest, avoid smoking, avoid ASA and NSAIDs
    e. Monitor for GI bleeding
    f. **Cimetidine** → Monitor for lethargy, depression, confusion
    g. **Ranitidine** → Monitor for constipation, diarrhea, nausea
    h. **Famotidine** → Monitor for drowsiness, dizziness, constipation
3. **Proton Pump Inhibitors (PPIs)** → **Omeprazole, Pantoprazole, Lansoprazole** (many end in -**azole**)
    a. Indications → Duodenal and gastric ulcers, GERD, Zollinger-Ellison syndrome
    b. MOA → **Inhibits an enzyme needed for gastric acid secretion** (reduces gastric acid secretion)
        i. Decreases stomach acid by inhibiting those gastric proton pumps that make the acid
            1. **THEY STOP THE ACID AT THE PUMP** ("zole" is the nice guy that shuts off the pump)
    c. S/E → GI upset, increased risk of osteoporosis w/ long-term use
4. **Mucosal Protectant** → **Sucralfate**
    a. Indications → Acute duodenal ulcers
    b. MOA → Reacts w/ stomach acid to **form a thick paste that adheres to ulcers**
        i. Protects the ulcer from further injury from acid and pepsin
    c. S/E → Constipation
    d. Med administration → QID (**1 hr before meals, and at bedtime**)
        i. May break or dissolve the medication in water, but do not crush or chew tablet
5. **Antacids** → **Aluminum hydroxide, Magnesium hydroxide, Calcium carbonate, Sodium Bicarbonate**
    a. Indications → PUD, GERD (promotes healing and relief of pain)
    b. MOA → **Neutralizes stomach acid**
    c. **Aluminum hydroxide** and **Calcium carbonate**→ May cause **constipation**
    d. **Magnesium hydroxide** → May cause **diarrhea**
    e. Med administration → Take at least 1 hr before or after any other meds
        i. **Take 1 hr and 3 hrs after meals, and at bedtime** (this may cause non-compliance w/ med)

1. Encourage compliance by reinforcement of positive effect of this med
   ii. Instruct to **chew the tablet thoroughly and then drink at least 8 oz water or milk**
   f. Never take an antacid with any other medications
6. **Prostaglandin E analog** → **Misoprostol**
   a. Uses → **Prevention of gastric ulcers** in pt taking NSAIDs on long-term basis
      i. Also induces labor by ripening the cervix
   b. MOA → Prevention of gastric ulcers
   c. S/E → Diarrhea, dysmenorrhea/spotting
   d. Prior to administration → **Perform pregnancy test** (med will result in miscarriage)

GASTROINTESTINAL DISORDERS

1. **Antiemetics** → **Ondansetron** (Zofran), **Diphenhydramine**, **Meclozine, Metoclopramide** (Reglan)
   a. Ondansetron MOA → Blocks serotonin receptors in CTZ
      i. Key points → Administer **prior** to chemotherapy (Vs. after pt already nauseous)
   b. Nursing consideration → remember most antiemetics can cause **sedation** so watch out for additive effect if given w/ narcotic analgesics and protect your pt from injury
   c. **Metoclopramide** → Monitor for **extra-pyramidal S/E**
2. **Laxatives**
   a. **Psyllium** → Bulk forming laxative (softens stool and increases bulk)
   b. **Docusate sodium** → surfactant laxative (softens stool by increasing water content)
   c. **Bisacodyl** → Stimulant laxative (stimulates peristalsis)
   d. **Magnesium hydroxide** → Osmotic laxative (draws water into intestine, promotes peristalsis)
      i. Monitor for **Mg toxicity and dehydration**
   e. Contraindicated → **Bowel obstructions** (need to R/O as cause of constipation)
   f. **Lactulose** → **Laxative used for hepatic encephalopathy**
      i. Indications → **Hepatic encephalopathy** (used to **decrease ammonia levels** and improve mental status)
      ii. MOA → Lowers pH in colon (promotes ammonia excretion)
      iii. Monitor for electrolyte imbalances and hyperglycemia
3. **Antidiarrheal** → **Loperamide** (Imodium), **Diphenoxylate plus atropine**
   a. MOA → **Stimulate opioid receptors in intestines**, causing a decrease in motility and increased absorption of Na and water
   b. S/E → Drowsiness, constipation
   c. **Diphenoxylate plus atropine** → at high doses, can cause opioid and anticholinergic effects
4. **Prokinetic Agents** → **Metoclopramide** (Reglan)
   a. Indications → N/V, gastroparesis, GERD
   b. MOA → **Accelerates gastric emptying** (Blocks dopamine and serotonin receptors in CTZ)
      i. Gets food and other stuff out of your stomach fast, so that way you can't throw it up
   c. S/E → Drowsiness, **extra-pyramidal symptoms** (rigidity, tremors, twitching, TD, restlessness)
5. **IBS Medications**
   a. IBS w/ diarrhea → **Alosetron** (Lotronex)
   b. IBS w/ constipation → **Lubiprostone** (Amitiza)

6. **5-Aminosalicylates** → **Sulfasalazine**
    a. Indications → **IBS, Crohn's disease, Ulcerative colitis**
    b. MOA → Inhibits prostaglandin synthesis (decreases colon inflammation)
    c. S/E → **Blood dyscrasias** (Anemia, agranulocytosis), GI upset, rash, headache

VITAMINS, MINERALS, AND SUPPLEMENTS

1. **Iron Supplements** → **Ferrous sulfate** (PO route), **Iron dextran** (IV/IM route)
    a. PO S/E → GI upset/constipation, black stool, teeth staining
    b. IV and IM S/E → Staining at IV site, hypotension, flushing
    c. Key points → **Vitamin C increases absorption**
        i. Take on an empty stomach (such as 1 hr before meals)
        ii. Keep out of reach of children - there is risk for fatal toxicity in children
2. **Vitamin B12/Cyanocobalamin**
    a. Indications → Tx vitamin B12 deficiency, megaloblastic (macrocytic) anemia RT vitB12 deficiency
        i. Vit B12 deficiency can result in megaloblastic (macrocytic) anemia
        ii. Vit B12 deficiency affects all blood cells produced in the bone marrow
    b. Megaloblastic anemia is either caused by a lack of folic acid or a lack of B12
        i. If lack of B12 → most likely intrinsic factor where pt unable to absorb B12
        ii. B12 is necessary to convent folic acid to from its inactive form to its active form
            1. Pt must have parenteral or intranasal B12 admin for rest of life in order to prevent folic acid deficiency
3. **Folic Acid**
    a. Uses → Treatment of megaloblastic anemia, prevention of neural tube defects, treatment of malabsorption syndrome, supplement for **alcohol use disorder**
    b. Before admin of folic acid - check vitamin B12 levels
        i. Avoid folic acid administration if pt has B12 deficiency
4. **Potassium Supplements**
    a. Uses → Prolonged vomiting or diarrhea, K loss from diuretic use
5. **Magnesium Sulfate** - Antidote is **Calcium gluconate**

HERBAL SUPPLEMENTS

1. **Echinacea**
    a. **Helps to stimulate the immune system** → Used to treat the common cold
    b. Chronic use → can ↓ **positive effects of meds for TB, HIV, or cancer**
2. **Garlic, ginger root and ginkgo biloba** → **high risk for bleeding**
3. **Ginger Root** → Used for morning/motion sickness and nausea; May also ↓ pain and stiffness from RA
    a. **Suppresses platelet aggregation**
4. **Ginkgo Biloba** → used to increase recall ability and mental processes (think Dementia and AD)
    a. May interact w/ meds that lower seizure threshold
        i. Antihistamines, antidepressants, and antipsychotics
    b. **May interfere w/ coagulation**

5. **Ginseng** → Used to improve appetite. Can ↓ effectiveness of **Timolol**; Does not affect bleeding
6. **Valerian** (kinda sounds like Valium)
    a. Uses → ↑GABA to prevent insomnia (promotes sleep w/ ↑ effect over time -risk 4 dependence)
    b. May cause drowsiness and depression
    c. Use caution in pt w/ mental health disorders
    d. Contraindicated → Pregnancy or breastfeeding
7. **Black Cohosh**→ Acts as an **estrogen substitute** (might be used during menopause)
    a. ↑ effects of antihypertensives meds and may ↑ effect of estrogen meds
    b. ↑ hypoglycemia in pt taking insulin or other diabetes meds
8. **St. John's Wort** → **Used for mild depression**
9. **Saw Palmetto** → **Helps with prostate**
    a. May result in false low prostate-specific antigen levels

MEDICATIONS AFFECTING THE REPRODUCTIVE TRACT

Key points when using Estrogen/Progesterone for birth control

- If used properly will prevent ovulation, thicken cervical mucus, and will alter endometrial lining to reduce the chance of fertilization

1. **Estrogens** → **Conjugated equine estrogen, Estradiol, Estradiol hemihydrate**
    a. Uses → Contraception, treatment of hypogonadism and prostate cancer (prevents spread)
        i. Relief of moderate to severe postmenopausal symptoms (i.e. hot flashes, mood changes), prevention of postmenopausal osteoporosis
    b. S/E → Endometrial and ovarian cancers, potential risk for estrogen-dependent breast cancer, embolic events (DVT, CVA, MI, PE)
        i. HTN, weight gain, edema
    c. Contraindications → Current smokers, HTN, pt or family hx of heart disease, atypical undiagnosed vaginal bleeding, breast or estrogen-dependent cancer, hx of embolic events
    d. Interactions → May reduce effectiveness of **warfarin**
2. **Progesterones** → **Medroxyprogesterone (Provera), Norethindrone, Megestrol acetate**
    a. Uses → Contraception (alone or in combination w/ estrogen), counter adverse effects of estrogen in menopausal hormone therapy
        i. Treat dysfunctional uterine bleeding due to hormonal imbalances, amenorrhea, endometriosis, advanced cancer of the endometrium, breast, and kidney
    b. Complications → Breast cancer, thrombolic events, edema, **jaundice**, migraines
    c. Contraindicated → Hx of embolic events, CVD, breast or genital cx; High risk for embolic events
    d. Pt education → **Delay conception for 3 mos after D/C meds**
3. **Androgens** → **Testosterone** (Androderm-50), **Methyltestosterone**
    a. Indications → Hypogonadism in males, delayed puberty in boys, anemia not responsive to traditional therapy, postmenopausal breast cancer, muscle wasting in men w/ AIDS
    b. S/E → Acne, hypercholesterolemia, liver dysfunction, polycythemia (↑Hgb and Hct), premature epiphyseal closure, edema, ↑ in growth of prostate cancer
        i. Women → Deeping of voice, baldness, hirsutism (hair growth on face)
    c. Contraindicated → Prostate or breast cancer; Severe cardiac, renal, or liver disease
    d. Pt education → There is high risk for abuse; Reduce cholesterol intake, daily wt

4. **5-Alpha Reductase Inhibitors** (**BPH Medications**) → **Finasteride, Dutasteride**
   "That guy has a FINE RIDE, but he does have BPH"
   a. Indications → Male pattern baldness, BPH (Benign prostatic hyperplasia = big prostate)
   b. MOA → Inhibits 5-alpha-reductase (prevents conversion of testosterone)
      i. Reduces prostate size and increases hair growth
   c. S/E → decrease libido, gynecomastia (enlarged breast in men)
   d. Key points → **Pregnant women should not handle medication**
   e. Pt education → Therapeutic effect may take 6 mos or longer, do not donate blood unless med has been D/C for at least 1 month
5. **Alpha1-Adrenergic Antagonists** (**BPH Medications**) → **Tamsulosin** (Flomax), **Silodosin**, **Alfuzosin**
   a. Indications → BPH; Off-label use for women to tx urinary hesitancy or retention
   b. MOA → Relaxes smooth muscles of the prostate (↑ urinary flow)
   c. S/E → Hypotension, dizziness, headache, issues w/ ejaculation
   d. Contraindications → Liver failure (Alfuzosin, Silodosin), renal failure (Silodosin)
   e. Pt education → Take at same time every day, monitor BP, change position slowly
6. **Erectile Dysfunction Agents** → **Sildenafil** (Viagra)**, Tadalafil, Vardenafil** (End in -fil)

"Fil is the guy that helps the nitric oxide 'fil' the penis"

   a. MOA → Enhances effect of nitric oxide released during sexual stimulation, resulting in increased blood flow to the corpus cavernosum (helps lead to getting and keeping an erection)
   b. S/E → Priapism (prolonged erection), **MI**, sudden death, headache, flushing, back pain
      i. **Sildenafil** → Temporary vision changes including "blue vision"
      ii. **Levitra** → Muscle aches
   c. Not all men can spend time w 'fil' → **Men w heart problems, uncontrolled BP probs, hx of stroke, or health problem that can cause priapism**
   d. Key points → **Do not take with other nitrates** (i.e. **NTG**), use caution w/ CVD

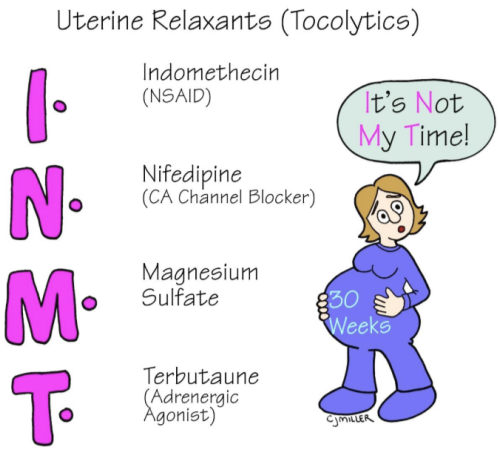
MEDICATIONS AFFECTING LABOR AND DELIVERY

1. **Uterine stimulants** → **Oxytocin (Pitocin), Dinoprostone, Methylergonovine**
   a. Indications → Induction (or enhancement) of labor, postpartum hemorrhage, placenta delivery
   b. MOA → ↑ Strength, frequency, and length of uterine contractions
   c. S/E → Uterine rupture, uterine tachysystole, placental abruption, painful contractions
   d. **Methylergonovine** → Monitor for HTN crisis (contraindicated w/ HTN, asthma, preeclampsia)
      i. Use only after delivery, and not during labor
   e. Nursing interventions → Monitor BP, RR, and HR q 30-60 mins and w/ every dosage change
      i. Monitor contractions - 1st stage of labor q 15 mins; 2nd stage q 5 mins

Goal of Contractions During Labor → Last 60 secs or less, every 2-3 mins
- Contraction lasting >60 secs or frequency < 2 mins → D/C Oxytocin, notify provider

      ii. Monitor for **uterine tachysystole** (>5 contractions in 10 mins, occurring within 1 min of each other, or a series of single contractions lasting greater than 2 mins)
      iii. If uterus has been overstimulated → Can use magnesium to cause relaxation

2. **Tocolytic Medications** → **Terbutaline, Nifedipine, Indomethacin, Magnesium Sulfate, Hydroxyprogesterone caproate**
    a. Indications → Preterm labor (Delays but does not prevent labor); COPD, asthma
    b. MOA → Activates beta 2 adrenergic receptors (causes relaxation of uterus and bronchodilation)
    c. S/E → Tachycardia, angina, restlessness, tremor
    d. Contraindicated → **Gestation of 34 wks or greater, cervical dilation > 6 cm**
    e. **Magnesium Sulfate toxicity** → Loss of DTRs, UO < 25-30mL/hr, RR <12, pulmonary edema, severe hypotension, chest pain



3. **Glucocorticoid medications** → **Betamethasone, Dexamethasone**
    a. Uses → Reduce neonatal respiratory distress syndrome
    b. MOA → Releases enzymes that produce/release lung surfactant to stimulate fetal lung maturity
    c. Medication administration → deep IM using ventral gluteal or vastus lateralis muscle
        i. Betamethasone IM for 2 doses 24 hr apart, Dexamethasone IM for 4 doses 12 hr apart
        ii. Gestation between 24-34 wks

CONNECTIVE TISSUE DISORDERS MEDICATIONS

Medication that end in -mab or -nib are typically immunosuppressants used for cancer/autoimmune disorders
- Priority is **risk for infection** (RT suppression of immune system)

DMARDs slow the joint degeneration and progression of RA
Glucocorticoids and NSAIDs provide symptom relief from inflammation and pain

1. **Disease-Modifying antirheumatic drugs (DMARDs)** → **Methotrexate, Cyclosporine, Hydroxychloroquine**
    a. Indications → RA, psoriasis
        i. **Methotrexate** uses → Cancers
        ii. **Cyclosporine** uses → UC, prevention of Graft Vs. Host disease in transplant pts
            1. Also used w/ Multiple Sclerosis patients
    b. **Methotrexate** MOA → Inhibits folic acid metabolism (prevents cell reproduction)
    c. S/E → Infections, hepatotoxicity, GI upset
        i. **Methotrexate** S/E → Bone marrow suppression (make sure to monitor CBC)
        ii. **Cyclosporine** S/E → Hirsutism, nephrotoxicity (monitor renal function)
    d. Nursing interventions → Notify provider ASAP of any S/S of infection, monitor LFTs
    e. **Hydroxychloroquine** pt education → Eye exam q6mos (med can cause retinal damage)

2. **Antigout Medications**
    a. **Colchicine** → Used to decrease inflammation and pain in an **acute gout attack**
        i. S/E → **GI upset**, thrombocytopenia
    b. **Probenecid** → Inhibits uric acid resorption (Treats hyperuricemia RT **chronic gout**)
        i. GI upset → GI upset, renal calculi (kidney stones)
    c. **Allopurinol** → **Inhibits uric acid production** (Treats hyperuricemia RT **chronic gout**)
        i. S/E → GI upset, rash, fever, hepatotoxicity, nephrotoxicity
        ii. **This is the only medical preventative treatment for gout**
        iii. Potential serious interactions include use of salicylates, loop diuretics, phenylbutazone, alcohol and warfarin
        iv. **Foods to avoid with gout** → Anchovies, sardine in oil, yeast, organ meat (liver, kidneys, sweetbreads), legumes (dried beans and peas), gravies, mushrooms, spinach, asparagus, cauliflower
            1. Whole grain bread and cereal, oatmeal, wheat germ, meat gravy, fresh and saltwater fish, beans, organ meats, mushrooms, green pean, spinach, asparagus, cauliflower, and baker's and brewer's yeasts, legumes (i.e. lentils)
    d. **NSAIDs and Prednisone** → Used as 1st line defense to treat pain and inflammation of gout attack
3. **Medications for Systemic Lupus erythematosus (SLE)** → **Belimumab**
4. **Medications for fibromyalgia** → **Duloxetine, Milnacipran, Pregabalin**

BONE DISORDER MEDICATIONS

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1. Calcium supplements → **Calcium citrate**
    a. Ensure pt has sufficient vitamin D
    b. **Monitor for hypercalcemia** → Tachycardia, elevated BP, muscle weakness, hypotonia, constipation, N/V, abdominal pain, lethargy, confusion

Raloxifene, Alendronate and Calcitonin patient education

- Monitor bone density (should have bone density scan q 12-18 mos), encourage adequate calcium and vitamin D intake, weight-bearing exercises, (i.e. walking 30-40 mins/day)

2. **Selective estrogen receptor modulator** → **Raloxifene** ("***Locks Calcium into the bone***")
    a. Uses → Postmenopausal osteoporosis, reduces risk of breast cancer
    b. MOA → Binds to estrogen receptors, ↓ bone resorption (helps keep Calcium in the bone)
        i. **Slows bone loss and preserves bone mineral density**
    c. S/E → increased risk of embolic events, hot flashes, leg cramps
    d. Contraindicated → Hx of venous thrombosis
3. **Bisphosphonates** → **Alendronate, Ibandronate, Risedronate**

"***After you take your Alendronate, you should go out and fly your drone"***

    a. Uses → Prophylaxis and tx of postmenopausal osteoporosis, Paget's disease
    b. MOA → Prevents bone resorption
    c. S/E → **Esophagitis**, GI upset, muscle pain, visual disturbances
    d. **Esophagitis** is the highest priority!!! It can cause ulcers in esophagus
        i. Medication administration → Take on an empty stomach w/ 240 mL of water, in the AM
            1. **Sit upright or ambulate for 30 mins after taking**
            2. **Ibandronate** → Remain upright &not ingest food or other meds for 1 hr after med

4. **Calcitonin** → **Calcitonin-salmon**
    a. Uses → Treats (but does not prevent) postmenopausal osteoporosis, treat hypercalcemia
    b. Most commonly give by nasal spray
        i. S/E includes **nasal dryness/irritation**. Educate pt to rotate nostrils daily
    c. Nursing intervention → Monitor for **Chvostek's or Trousseau's sign** (indicates hypocalcemia)

NONOPIOID ANALGESICS MEDICATIONS

1. **Nonsteroidal anti-inflammatory drugs (NSAIDs)** → A**spirin, Ibuprofen, Naproxen, Indomethacin, Celecoxib, Ketorolac**
    a. Uses → Mild to moderate pain, fever, inflammation
    b. S/E → GI discomfort, GI bleeding, **renal toxicity**, rash
    c. ASA S/E → Tinnitus, Reye syndrome, and Salicylism
        i. **Reye syndrome** → Avoid ASA in children/adolescents w/ viral illness
        ii. **Salicylism sx** → tinnitus, sweating, headache, dizziness, respiratory alkalosis
    d. **ASA toxicity** → Treated w/ **activated charcoal**, gastric lavage
    e. Contraindicated → PUD, bleeding disorders (i.e. hemophilia and vit K deficiency)
    f. **Ketorolac** → Contraindicated w/ advanced renal disease; Do not use longer than 5 days
    g. Pt education → Avoid alcohol
2. **Acetaminophen** (Tylenol)
    a. Indications → Mild to moderate pain, fever
    b. S/E → Hepatotoxicity in high doses (**INTAKE SHOULD NOT EXCEED 4g/DAY**)
        i. Pts who consume more than 3 alcoholic drinks per day - limit to 2g/day
    c. Acetaminophen toxicity (OD) → Antidote is acetylcysteine
        i. Administer via an duodenal tube to prevent emesis and subsequent aspiration
    d. Interactions → Acetaminophen slows metabolism of warfarin (risk for bleeding)

OPIOID AGONISTS AND ANTAGONISTS MEDICATIONS

1. **Opioid agonists** → **Morphine, Fentanyl, Meperidine, Methadone, Codeine**
    a. Monitor for hypotension, respiratory depression, sedation, constipation, urinary retention
2. **Agonist-Antagonist opioids** → **Butorphanol, Nalbuphine, Buprenorphine, Pentazocine**
    a. Lower potential for abuse, less respiratory depression, less analgesic effect
    b. Buprenorphine can be used to treat opioid dependence
3. **Opioid antagonist** → **Naloxone** (Narcan)
    a. Watch for HTN, tachycardia, agitation, GI upset

ADJUVANT MEDICATIONS FOR PAIN

1. Tricyclic antidepressants → **Amitriptyline, Imipramine**
2. Anticonvulsants → **Carbamazepine, gabapentin**

MISCELLANEOUS PAIN MEDICATIONS

1. Migraine medications

a. **Ergot alkaloids** → **Ergotamine, Dihydroergotamine**
b. **Triptans** → **Sumatriptan, Almotriptan, Frovatriptan**
c. Indications → Vascular headaches (migraine and cluster headaches)
    i. **Used as abortive therapy to stop a migraine after it begins or after prodromal manifestations start**
d. MOA → Vasoconstriction of intracranial arteries
e. **Ergotamine** S/E → GI upset, muscle pain, numbness/tingling, HTN
f. **Sumatriptan** S/E → Warm/tingling sensation, dizziness, angina, injection site discomfort
g. Pt education → Lay down in a dark, quiet place to help with symptoms
    i. Avoid alcohol and tyramine-rich foods (aged cheese, wine) - Can trigger migraines

2. **Local anesthetics** → **Lidocaine**
    a. **Topical route** → Used to decrease pain in conditions involving the skin and mucous membranes, IV insertion
    b. **Parenteral route** → Used to ↓pain in minor surgical procedures, epidurals, diagnostic procedures
        i. Minor procedures such as IV insertion, injection (pediatric), wart removal
    c. MOA → Blocks conduction of pain impulses in a circumscribed area
    d. **Parenteral S/E** → Hypotension, bradycardia, prolonged labor, spinal headache, allergic reaction
    e. Nursing considerations → **EMLA cream**, apply 1 hr before procedure and cover w/ occlusive dressing; Avoid wrapping or heating the area
        i. Prior to the procedure → Remove the dressing and clean the skin w/ aseptic solution

INSULINS

"We'll climb to the peak... Starting FAST and ending SLOW"

		ONSET	PEAK	DURATION
FASTEST	**Rapid-Acting: Lispro (Humalog)**	**< 15 mins**	**30 min-1 hr**	**3-4 hrs**
FAST	**Short-Acting: Regular (Humulin R)**	**30min-1hr**	**2-3 hrs**	**5-7 hrs**
SLOW	**Intermediate-Acting : NPH (Humulin N)**	**1-2 hrs**	**4-12 hrs**	**18-24 hrs**
SLOWEST	**Long-Acting: Insulin Glargine (Lantus)**	**1 hr**	**NONE**	**24 hrs**

Tricks to remember insulins

- Rapid-Acting: Lispro (Huma**LOG**) → Log has 3 letters; Onset begins in 30 mins, duration is 3 hrs
- Short-Acting: Regular (Humu**LIN** R) → **LIN** is just a regular person
  - Regular has 7 letters and the duration is up at 7 hrs
- Intermediate-Acting: **NPH** (Humulin N) → **N**eal **P**atrick **H**arris is of intermediate height
  - He is a hard working actor. If you call him, he will come **onset** in 1-2 hrs and stay for 18-24hrs

Insulin Key Points

- Increase dosage during illnesses
- Insulin suspensions - gently rotate vial b4 admin
- Hypoglycemia = BG < 70
- Hypoglycemia in fully conscious pt → Administer 15 g glucose (i.e. 4 oz OJ, 8oz milk)
- Hypoglycemia NOT fully conscious pt → Administer IM glucagon

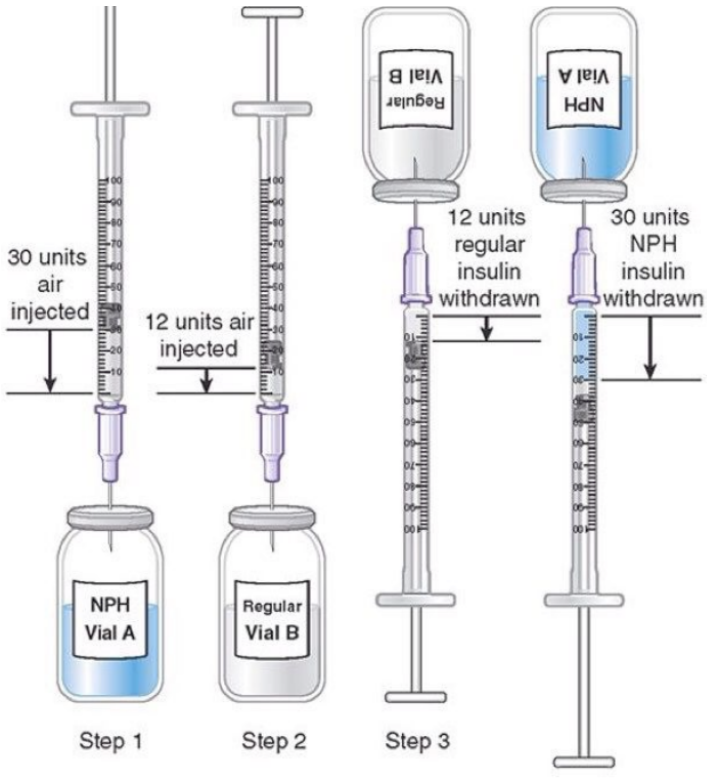
Mixing short-acting and long-acting insulins

- Draw short-acting insulin in syringe first, then longer-acting insulin
- Do not mix long-acting insulins (insulin glargine) w/ other insulins

NPH and premixed insulins - should appear cloudy
Regular and insulin glargine - should appear clear

****DRAW UP THE CLEAR BEFORE THE CLOUDY**
Remember *Nancy Regan, RN*

- **Inject air into NPH, inject air into regular**
- **Draw up regular, draw up NPH**



ORAL ANTIDIABETIC MEDICATIONS

Therapeutic Uses: Control blood glucose levels in T2DM; Used in conjunction w/ diet and exercise changes
- T1DM will always need insulin; T2DM may be managed with only oral antidiabetics

Monitor for hypoglycemia!!!!
- **Abrupt onset** → Tachycardia, palpitations, diaphoresis, shakiness (SNS symptoms)
- **Gradual onset** → Headache, tremors, weakness (PNS symptoms)

1. **Sulfonylureas** → **Glipizide, Chlorpropamide, Tolzamide, Glyburide, Glimepiride**
    a. S/E → Photosensitivity, GI upset
    b. Pt education → Avoid alcohol, wear sunscreen
2. **Meglitinides** → **Repaglinide** (***"woman in the pageant can't go on stage bc she has angina"***)
    a. S/E → Angina
    b. Administration → TID, eat within 30 mins of dose
3. **Biguanides** → **Metformin**
    a. MOA → ↓ glucose production in the liver, and ↑ glucose uptake
    b. S/E → Metallic taste
        i. **GI upset** (anorexia, nausea, diarrhea); Usually subsides w/ use; May cause wt loss of 3-4 kg
        ii. **Vitamin B12 and folic acid deficiency**; May need B12 supplement
        iii. **Lactic acidosis**; Sx - hyperventilation, myalgia, sluggishness, somnolence
    c. Pt education → Avoid alcohol, **take medication w/ food**
    d. **Concurrent use of iodine-containing contrast media can result in acute kidney failure**
        i. If taking metformin → D/C 24-48 hr prior to procedure; Can resume 48 hr after test
4. **Thiazolidinediones** → **Pioglitazone**
    a. MOA → ↓ insulin resistance, ↑ insulin glucose uptake, ↓ glucose production
    b. S/E → **Fluid retention, ↑LDL, hepatotoxicity**
    c. Contraindicated → HF
    d. Administration → Take 1x day, **with or without food**
    e. Pt education → Monitor for signs of hepatotoxicity, wt daily
5. **Alpha glucosidase inhibitors** → **Acarbose**
    a. MOA → Inhibits glucose absorption in the GI tract
    b. S/E → **Anemia, hepatotoxicity**
        i. GI upset (abdominal distention/cramping, hyperactive BS, diarrhea, excessive gas)
    c. Contraindicated → GI disorders (inflammatory disease, ulceration, or obstruction)
    d. Administration → TID, w/ first bite of food
6. **Hyperglycemic Agents** → **Glucagon**
    a. Indications → **Severe hypoglycemia** when pt is unable to take PO glucose
    b. MOA → Stimulates breakdown of glycogen into glucose in the liver
    c. S/E → GI upset
    d. Administration → **SQ, IM, or IV route**; Provide food as soon as pt can safely swallow

ENDOCRINE DISORDERS MEDICATIONS

HYPERthyroidism sx → Anxiety, tachycardia, palpitations, altered appetite, abdominal cramping, heat intolerance, fever, diaphoresis, weight loss, menstrual irregularities
Hypothyroidism sx → Depression, bradycardia, weight gain, anorexia, cold intolerance, dry skin, menorrhagia

1. **Thyroid hormone** → **Levothyroxine** (Synthroid) ("***synthetic form of thyroid hormone***")
    a. Indications → Hypothyroidism
    b. MOA → Acts as a synthetic form of T4 or T4
    c. S/E → Hyperthyroidism (if dose is too high)
    d. Nursing considerations → Monitor T4 and TSH levels (at least 1x per year)
    e. Administration → **Empty stomach w/ full glass of water, 30-60 mins before breakfast**
        i. Daily therapy begins w/ low dose that increases gradually over several weeks
        ii. Full effect can take 6-8 wks
2. **Antithyroid medications** → **Propylthiouracil (PTU), radioactive iodine (RAI), strong iodine solution**
3. **Propylthiouracil** (PTU) ("***Prevents thyroid from being too high***")
    a. Indications → Graves' disease (hyperthyroidism) and in preparation for thyroidectomy
    b. MOA → Blocks synthesis of thyroid hormones
    c. S/E → GI upset, rash, **agranulocytosis** (monitor CBC), **hepatotoxicity** (monitor LFTs)
    d. Pt education → Take 1-2 wks for full effect
4. **Radioactive iodine (RAI)**
    a. Indications → Hyperthyroidism and thyroid cancer
    b. MOA → Absorbed by thyroid, destroys thyroid-producing cells (helps get rid of thyroid cells)
    c. S/E
        i. **Radiation sickness** → Hematemesis, epistaxis, intense N/V
        ii. **Bone marrow suppression** → Anemia, leukopenia, thrombocytopenia
    d. **Radioactivity precautions** → Maintain distance of 6 ft from others, do not prepare food for others or share utensils, flush twice, ↑ fluid intake and void frequently (helps get rid of iodine), avoid coughing &expectoration, and dispose of body wastes protocol; For prescribed amt of time
5. **Strong iodine solution (Lugol's solution): Nonradioactive iodine**
    a. Indications → Hyperthyroidism/thyrotoxicosis and in preparation for thyroidectomy
        i. Used w/ thyroidectomy to reduce thyroid gland size prior to thyroid removal surgery
    b. MOA → Inhibits thyroid production and release due to high levels of iodide
    c. S/E → GI upset, hypersensitivity (rash, pruritus)
        i. Iodism; Sx → **Metallic taste, stomatitis, sore teeth and gums, frontal headache, rash**
            1. **Sodium thiosulfate** used to reverse iodine
    d. Pt education → Mix w/ juice to improve taste, avoid foods high in iodine (iodized salt, seafood), increase fluid intake
6. **Growth hormone** → **Somatropin**
    ("***he plays basketball but is short, so she takes Somatropin to take home the trophy***")
    a. Indications → Growth hormone deficiencies (pediatric and adult)
    b. MOA → Stimulates growth and protein synthesis (Mimics naturally occurring GH)
    c. S/E → Hyperglycemia, renal calculi
    d. Administration → via IM or SQ, make sure to rotate injection sites
    e. **Stop treatment prior to epiphyseal closure** → Closely monitor growth rate and bone age

        i. Growth rate and bone age will determine when to stop tx (prior to epiphyseal closure)
7. **Antidiuretic hormone** → **Vasopressin, Desmopressin** ("***it will help to suppress all that urine***")
    a. Indications → Diabetes Insipidus (really high amount of diuresis)
    b. MOA → mimics ADH & causes reabsorption of water in the kidneys (**↓UO and ↑urine osmolality**)
        i. **Vasopressin** causes potent vasoconstriction, **desmopressin** not so much
    c. S/E → **Overhydration** (sx → sleepiness, pounding headache, confusion)
        i. Vasopressin may cause MI due to excessive vasoconstriction
    d. Key points → Fluid restriction, monitor urine specific gravity
        i. Strict I&Os!!!! **Ensure UO is 1.5-2L/24hrs**
    e. Vasopressin contraindications → CAD, poor peripheral circulation and chronic nephritis, or pt w/ creatinine clearance less than 50 mL/min
    f. IV Vasopressin → Monitor site frequently bc extravasation can lead to gangrene
8. **Adrenal hormone replacement** → **Hydrocortisone** (**-sone** = steroid, then there corticol in the name)
    a. Indications → **Adrenocortical insufficiency** (Addison's disease, adrenal crisis)
        i. May also be used for inflammation, cancer, and allergic reactions
    b. MOA → Mimics naturally occurring cortisol
        i. Maintains BP, regulates metabolism and inflammatory response
    c. S/E → Osteoporosis (bone loss), peptic ulcer, GI upset, infection, weight gain, skin fragility
        i. Think back to what steroid S/E are
    d. Monitor for **adrenal suppression** (sx → Fatigue, muscle weakness, wt loss, hypotension)
    e. Pt education → Monitor for signs of peptic ulcer, do not stop med abruptly, may need an increased dose during times of stress (surgery, trauma, infection), take Ca and vit D supplements, avoid NSAIDs and alcohol
        i. May have prophylactic H2 receptor antagonists (i.e. **Ranitidine, Cimetidine**)

CHEMOTHERAPY AGENTS

1. **Antimetabolites** → **Methotrexate**
2. **Antitumor Antibiotic** → **Doxorubicin**
    a. Indications → Solid tumors
    b. MOA → Binds to DNA, inhibiting DNA &RNA synthesis (causes death of rapidly replicating cells)
    c. S/E → GI upset, alopecia, bone marrow suppression (anemia, neutropenia, thrombocytopenia), cardiac toxicity, **red discoloration of urine/sweat/tears**
    d. Nursing consideration → Monitor for infection, cardiac function and CBC; Admin antiemetics N/V
    e. Monitor for bleeding
3. **Antimitotic Medications** → **Vincristine**
    a. Indications → Variety of tumors and cancers
    b. MOA → Stops cell division during mitosis (M phase specific)
    c. DOES NOT CAUSE BONE MARROW SUPPRESSION
    d. S/E → **Peripheral neuropathy**, phlebitis (IV site), GI upset, alopecia
    e. Nursing considerations → Use central line for infusion, monitor for signs of neuropathy
4. **Alkylating Agent** → **Cyclophosphamide** ("***It'd be really cyc if you had blood in your urine***")
    a. Indications → Variety of tumors and cancers
    b. MOA → Inhibits protein synthesis by interfering w/ DNA and RNA synthesis
    c. S/E → Bone marrow suppression, GI upset, alopecia, hemorrhagic cystitis
    d. MONITOR FOR **HEMORRHAGIC CYSTITIS** → Monitor for **blood in urine**
    e. Nursing considerations → ↑ fluid (2-3L) during therapy, monitor CBC
5. **Prostate cancer medications** → **Leuprolide**
    a. Indications → Prostate cancer
    b. MOA → ↓ levels of testosterone produced by testes
    c. S/E → **Hot flashes, gynecomastia, bone loss, ↓ libido**
    d. Key points → ↑ Ca and vitamin D, monitor PSA and testosterone levels during tx
6. **Breast cancer medications** → **Tamoxifen** ("***Tammy has breast cancer***")
    a. Indications → Breast cancer
    b. MOA → Competes w/ estrogen for binding sites in breasts, stopping growth of estrogen-dependent cancers
    c. S/E → Hot flashes, GI upset, hypercalcemia, increased risk of endometrial cancer, PE
7. **Biologic Response Modifiers** → **Interferon alfa-2b** ("***Interferes w/ a lot of different things***")
    a. Indications → **Cancers and viral infections** (i.e. Hepatitis)
    b. MOA → interferons are proteins that increase immune response to tumors/viruses
        i. Result is a **decrease in cancer cell production**
    c. S/E → MANY!! **Flu-like symptoms** (**fever, muscle aches, chills, lethargy**), bone marrow suppression, cardiotoxicity, neurotoxicity, alopecia, GI upset, psychiatric disorders
    d. Nursing considerations → Monitor for flu-like symptoms, administer **acetaminophen** as ordered

ANTIBIOTICS AFFECTING THE BACTERIAL CELL WALL

MOA for all of these medications → Destroys bacterial cell wall, causing cell death

1. **Penicillins** → **Penicillin** (***narrow spectrum***), **Amoxicillin** (***broad spectrum***), **Piperacillin tazobactam**
    a. Indications → Bacterial infections
    b. S/E → GI upset, **allergic reaction** (dyspnea, rash), renal toxicity
    c. Key points → **DO NOT GIVE TO PTS WITH HX OF ALLERGIES TO PCN OR CEPHALOSPORIN**
        i. Pt who never took PCN → Need to monitor really close during first dose
    d. **Amoxicillin/Clavulanate suspension** → Administer q8-12hrs, shake the medication bottle well before each dose, store the medication in the fridge, report diarrhea immediately
2. **Cephalosporins** → **Cephalexin, Cefazolin, Ceftriaxone, Cefaclor, Cefepime** (many start with **-cef**)
    a. Indications → Bacterial infections (UTI, post-op infection, pelvic infections, meningitis)
    b. S/E → GI upset, **superinfection** (cDiff, yeast infection), **allergic reaction** (dyspnea, rash)
    c. Nursing considerations → **DO NOT GIVE TO PT W/ HX OF PCN ALLERGY**
    d. Pt education → **Avoid alcohol during therapy,** take medication w/ food
    e. **Cefotetan** and **Ceftriaxone** → Avoid use in pt w/ bleeding disorders or taking anticoagulants
    f. If **allergic reaction develops** (rash, dyspnea) → 1st step is to DC IV infusion
3. **Carbapenems** → **Imipenem-cilastatin, Meropenem**
    a. Indications → Serious bacterial infections (it is a broad spectrum antimicrobial)
    b. S/E → GI upset, rash, superinfection
    c. Nursing considerations → Need to carefully question pt about **allergy to PCN or cephalosporin**
        i. Pt w/ allergy may have an allergic reaction to carbapenems
4. **Antibiotics for serious infections** → **Vancomycin**

    ("***they listened to really loud music in the van and lost hearing***")
    a. Indications → **Serious infections and antibiotic-associated cDiff infection**
    b. S/E
        i. Infusion reactions → Monitor for **RED MAN SYNDROME** (rashes, flushing, ↑ HR, ↓BP)
            1. Should administer Vancomycin slowly over 60 mins
        ii. **Phlebitis** → Very big risk for this!! This is why **vanco is usually admin via PICC**
            1. Monitor injection site for redness, swelling and inflammation
        iii. **Ototoxicity and renal toxicity** → BIGGEST CONCERN (ototoxicity is rare and irreversible)
            1. Dose may need to be adjusted according to creatinine levels
    c. Nursing considerations → **Monitor vancomycin trough levels** (done 30 mins before next dose)
    d. Contraindicated → **Allergy to corn or corn products and previous allergy to Vancomycin**

ANTIBIOTICS AFFECTING PROTEIN SYNTHESIS

1. **Tetracyclines** → **Tetracycline, Doxycycline, Minocycline, Demeclocycline**
    a. Indications → Bacterial infections, acne, Lyme disease
    b. MOA → Prevents protein synthesis, inhibiting bacterial growth (***bacteriostatic***)
    c. S/E → hepatotoxicity, superinfection
        i. **Tooth discoloration in children and fetuses** (**Avoid use in children under 8 y/o and women who are pregnant**)
        ii. Photosensitivity (**Intense sunburn**) → Educate pt to wear sunscreen
        iii. GI upset (cramping, N/V/D, esophageal ulceration)
            1. **Educate pt don't lay down right after administration of med**
    d. Administration → Take on an empty stomach w/ full glass of water
    e. Interactions → ↓ effectiveness of oral contraceptives
        i. **Dairy products (milk), food high in Ca, and antacids** → ↓ absorption
            1. Educate pt to **avoid dairy products (i.e. milk) and foods high in Ca, & antacids**
2. **Macrolides** → **Erythromycin, Azithromycin**
    a. Indications → Bacterial infections
        i. **Administer to all infants following delivery**; Med is both bacteriostatic and bactericidal and thus provides prophylaxis against Neisseria gonorrhoeae and Chlamydia trachomatis
    b. MOA → Inhibits protein synthesis, slowing bacterial growth (***bacteriostatic***)
    c. S/E
        i. **GI upset** (N/V, epigastric pain) → Administer **erythromycin** w/ meals
            1. **If pt doesn't have GI upset → Administer on empty stomach w/ 8oz water**
        ii. **Prolonged QT intervals** (causing **dysrhythmias** and possible cardiac death)
            1. Avoid use in pt w/ prolonged QT interval
        iii. **Ototoxicity** → Monitor for and report **tinnitus, hearing loss, vertigo**
    d. Contraindications → **Prolonged QT interval and liver disease**
        i. Monitor LFTs for therapy lasting longer than 2 wks
3. **Aminoglycosides** → **Gentamicin, Tobramycin, Neomycin, Streptomycin**
    a. Indications → **Serious** bacterial infections (aerobic gram-negative bacilli)
    b. MOA → Destroys bacterial by inhibiting protein synthesis (bacteriocidal)
    c. S/E → Vertigo and ataxia
        i. **Ototoxicity** → **Cochlear damage** (hearing loss), **vestibular damage** (loss of balance)
            1. Monitor for tinnitus, headache, hearing loss, nausea, dizziness, vertigo
            2. Obtain baseline audiometric studies (hearing tests)
        ii. **Nephrotoxicity** → Monitor for and report **hematuria and cloudy urine**
        iii. Intense neuromuscular blockade → Results in respiratory depression, muscle weakness
        iv. **Streptomycin** → **Neurologic disorders** (peripheral neuritis, optic nerve dysfunction, tingling/numbness of the hands and feet)
    d. Administration → via IM or IV; M**onitor peak and trough levels**
        i. Divided doses → Obtain peak levels 30 mins after admin of IM or 30 mins after IV infusion
    e. Nursing considerations → Monitor creatinine, BUN, I&O, hematuria
        i. Do not mix aminoglycosides and PCN in the same IV solution

MEDICATIONS FOR URINARY TRACT INFECTIONS

1. **Sulfonamides and trimethoprim** → **Trimethoprim-sulfamethoxazole**
    a. S/E
        i. Hypersensitivity (including ***Stevens-Johnson syndrome***) - **STOP MED IF RASH DEVELOPS**
        ii. Blood dyscrasias (hemolytic anemia, agranulocytosis, leukopenia, thrombocytopenia
            1. Observe for and report any bleeding, sore throat, or pallor
        iii. Crystalluria → Encourage adequate PO intake (8 8oz glasses of water/day)
            1. **UO should be at least 1200mL/day**
        iv. Kernicterus → Jaundice, hyperbilirubinemia, neurotoxic for newborns
            1. Avoid use in pregnant women, breastfeeding women, infants under 2 mos old
        v. Hyperkalemia
    b. Administration → Empty stomach w/ 8 oz of water
2. **Urinary tract antiseptic** → **Nitrofurantoin**
    a. S/E → Blood dyscrasias, **hepatotoxicity**, peripheral neuropathy, headache, drowsiness, dizziness
        i. GI discomfort (anorexia, N/V/D) → May take w/ milk or meals
        ii. Hypersensitivity → Fever, chills, **severe pulmonary manifestations** (dyspnea, cough, CP, alveolar infiltrations); Educate pt never take this med again, S/S go away soon
    b. Contraindications → **CKD** (creatinine clearance below 40mL/min), pregnant women
    c. Pt education → **Urine may turn rust-yellow to brown color and can stain teeth**
3. **Fluoroquinolones** → **Ciprofloxacin, Levofloxacin**
    a. S/E → GI upset (pt may take med w/ milk or food), **superinfection**
        i. ACHILLES TENDON RUPTURE
            1. Monitor for & report any pain, swelling, and redness at the Achilles tendon site
        ii. Photosensitivity (severe sunburn) → May be from direct and indirect sunlight/sun lamps
        iii. CNS effects → Dizziness, headache, restlessness, confusion
    b. Administration → IV route be sure to dilute solution slowly over 60 min in a large vein
4. **Urinary tract analgesic** → **Phenazopyridine**
    a. Uses → Relieves manifestations of burning w/ urination, pain, frequency, and urgency
    b. MOA → Function as a local anesthetic on the mucosa of the urinary tract
    c. Contraindications → AKI and CKD
    d. Pt education → **URINE CHANGES TO AN ORANGE-RED COLOR** (able to stain clothes)
    e. Administration → With or after meals to minimize GI discomfort

MEDICATIONS FOR MYCOBACTERIAL, FUNGAL, AND PARASITIC INFECTIONS

1. **Antimycobacterial** (selectie antituberculosis) - think **RIPE**
    a. **Rifampin, Isoniazid, Pyrazinamide, Ethambutol**
        i. **Key points:** Pt will be on 4 or more meds for 6-12 mos due to high resistance of TB
    b. S/E → Peripheral neuropathy, hepatotoxicity
        i. **Rifampin** S/E → **ORANGE SECRETIONS**, GI upset, ↓ effectiveness oral contraceptives
        ii. **Ethambutol** S/E → changes in vision (**E**thambutol = **E**yes)
    c. Pt education → Avoid alcohol, family members should be tested for TB, sputum samples will be needed every 2-4 wks (no longer considered contagious w/ 3 negative cultures)
        i. Transporting pt w/ TB → Have them wear a surgical mask
    d. Nursing considerations → **Negative airflow room and airborne precautions**
2. **Antiprotozoals** → **Metronidazole** (**Flagyl**)
    a. Indications → Bacterial and protozoal infections
    b. S/E → GI upset (N/V, dry mouth, **metallic taste**) - (***"METROnidazole - METallic taste"***)
        i. **Darkening of urine** → Educate pt that this is a harmless effect
        ii. Neurotoxicity, CNS effects (numbness of extremities, ataxia, seizures)
            1. Stop medication and notify provider
        iii. Pseudomembranous colitis → Monitor & report **fever, diarrhea, abd pain, bloody stool**
    c. Contraindications → Active CNS disorders, blood dyscrasias and during lactation
    d. Pt education → **Avoid alcohol**
3. **Antifungals** → **Amphotericin B, Ketoconazole, Nystatin**
    a. Indications → Systemic fungal infections
    b. S/E → **Thrombophlebitis, nephrotoxicity, hypokalemia, bone marrow suppression**
        i. **Amphotericin B** S/E → **HIGHLY TOXIC** (only used for life threatening fungal infections)
            1. Administer a **test dose** of 1 mg being sure to infuse slowly
        ii. **Ketoconazole** S/E → **Hepatotoxicity**

MEDICATIONS FOR VIRAL INFECTIONS, HIV, AND AIDS

1. **Antivirals** → **Acyclovir, Ganciclovir**
    a. **Acyclovir** uses → Symptoms of herpes, Varicella-zoster viruses
    b. **Ganciclovir** → Symptoms of cytomegalovirus
    c. S/E → Phlebitis, GI upset, nephrotoxicity
        i. **Ganciclovir** S/E → Bone marrow suppression (anemia, neutropenia, thrombocytopenia)
            1. Monitor CBC and signs of infection
    d. Pt education → **Medications DO NOT CURE conditions**
        i. **Acyclovir** → Topical route, advise pt to wear rubber gloves to avoid transfer of virus to other areas of the body
    e. **Ganciclovir** can cause infertility → Educate pt to use barrier contraception during tx and for 3 mos following tx
2. **Antiretrovirals** → **Enfuvirtide** (Used to decrease and limit the spread of HIV)
    a. S/E → Localized reaction at injection site, bacterial PNA, fever, chills, rash, hypotension, rash
    b. Administration → ONLY subq
3. **Antiretrovirals** → **Zidovudine** (Used to reduce HIV symptoms)
    a. S/E → Bone marrow suppression, lactic acidosis, N/V/D, hepatomegaly/fatty liver
4. **Antiretrovirals** → **Ritonavir** (Used to treat HIV infection)
    a. S/E → Bone loss/osteoporosis, DM/hyperglycemia, elevated serum lipids, rhabdomyolysis

MED SURG

1. **Glascow Coma Scale (GCS)** → Eye opening, verbal response, motor response
2. **Romberg test** → **Performed once w/ eyes open and once w/ eyes closed**. Stand w/ feet together
    a. Used to assess balance and motor function
3. **Normal ICP** = 10-15 mmHg. **Sx ↑ ICP** → irritability (***early sign***), restlessness, headache, decreased level of consciousness, pupil abnormalities, abnormal breathing/posturing
    a. **Interventions to ↓ ICP** are reduce hypercarbia (hyperventilate pts), avoid suctioning, maintain HOB 30 degrees, spread out nursing activities throughout day
    b. **Cushing's Triad** = Severe HTN w/ widening pulse pressure (sys-dia), and bradycardia (***indicates a late finding of ↑ ICP***)
4. **Lumbar Puncture**. Position pt in cannonball position OR stretched over table
    a. Need to lay flat for several hours after procedure
5. **Meningitis**. **Hib vaccine** given to infants, **MCV4 vaccine** for college dorm students
    a. Dx by CSF; **Bacterial** = cloudy CSF, ↓ glucose and **viral** = clear CSF
    b. **Droplet precautions** until axb are administered for 24 hrs
6. **Parkinson's Disease** → Too little dopamine, too much acetylcholine
7. **Multiple Sclerosis** → Characterized by periods of relapsing and remitting
    a. Sx → Eye problems (diplopia/nystagmus), muscle spasticity and weakness, bowel/bladder dysfunction, cognitive changes, ear problems (tinnitus, hearing issues), dysphagia, fatigue
    b. Medications → Autoimmune agents (Cyclosporine), prednisone, muscle relaxant
8. **Myasthenia Gravis (MG)**. Sx → Muscle weakness, diplopia, dysphagia, impaired respiration, drooping eyelids, incontinence
    a. Admin **Edrophonium** (↑ Ach). If sx improve - it is MG. If not - cholinergic crisis
    b. Tape eyes shut at night!!!
9. **Cluster headaches** → Possible sx of facial sweating or nasal congestion
10. **Macular Degeneration** → Loss of **CENTRAL VISION**; Sx include blurred vision &blindness
11. **Cataracts** → Opacity in lens of an eye, impairing vision (Sx → ↓ visual acuity, progressive/painless loss of vision, diplopia, **halo around lights**, photosensitivity, absent red reflex, **cloudy vision**)
    a. Post-op → Avoid bending at waist, sneezing/coughing, restrictive clothing
12. **Glaucoma** → ↑ in IOP due to issue w/ optic nerve; **Leading cause of blindness**
    a. **Open-angle glaucoma**: loss of **PERIPHERAL VISION**. Mild eye pain
13. **Detached retina** → **Floating dark spots**
14. 2 classifications of strokes → Hemorrhagic or Ischemic (**thrombotic or embolic**)
    a. **Hemorrhagic stroke** = Ruptured artery/aneurysm
    b. **Thrombotic stroke** = Blood clot in cerebral artery
    c. **Embolic** = Blood clot from other part of the body that traveled to cerebral artery
    d. **tPA only given for ischemic strokes**. Must be given within 3-4.5 hrs of onset S/S
15. **Paraplegia** is an injury below T1, **quadriplegia** is an injury in cervical region
16. **Autonomic dysreflexia** → For injuries above T6, considered a neurologic emergency
    a. Sx: extreme HTN, severe headache, blurred vision, diaphoresis
    b. Nursing: **Sit pt up**, determine cause (usually fecal impaction/bladder distention)
17. **Bronchoscopy** is used for visualization of airway (larynx, trachea, bronchi), biopsies, aspiration of deep sputum or excision of lesions. Ensure pt is NPO 4-8hrs prior
    a. After procedure - Sore/dry throat, and small amt of blood-tinged sputum is EXPECTED

18. **Thoracentesis** is a surgical perforation of chest wall and pleural space w/ a large-bore needle to obtain specimens, inject medication, or remove fluid/air (effusion)
    a. Complications → Mediastinal shift, pneumothorax, bleeding and infection
        i. Expected to have localized bloody drainage on dressing
19. **Chest tubes** drain fluid, air, or blood from pleural space
    a. For **pneumothorax** - chest tube tip positioned **UPWARD**
    b. For **hemothorax or pleural effusion** - chest tube tip positioned **DOWNWARD**
    c. **Drainage Collection Chamber** → **Notify provider if drainage >70 mL/hr**
    d. **Water Seal Chamber** → Add sterile fluid up to 2cm line, check q2h
        i. Chamber must be kept upright and **below chest tube insertion site**
        ii. **Tidaling is expected** (Lack of tidaling = lung re-expansion/obstruction)
        iii. **Continuous bubbling** indicates an air leak
    e. **Suction Control Chamber** → **Continuous bubbling** is expected
    f. Nursing considerations → maintain pt in semi/high fowler's position, obtain chest x-ray to verify tube placement.
        i. Supplies kept @ bedisde- **2 hemostats, sterile water, occlusive dressing**
        ii. Sutures at the insertion site should be covered w/ airtight dressing
    g. Removal → Tell pt to take a deep breath, exhale, and bear down. **Apply sterile petroleum jelly gauze dressing** over chest tube site
    h. If drainage system becomes compromised → **Place end of tube into sterile water!!!**
    i. Chest tube accidentally removed - Place occlusive dressing over site, **ONLY TAPE 3 SIDES**
    j. Monitor for **tension pneumothorax** which could result from kink in tubing or an obstruction
20. **Hypoxia S/S** → ***Early rat is late to bed***
    a. Early S/S (RAT) → **R**estlessness, **a**nxiety, **t**achycardia/**t**achypnea; HTN, pale skin
    b. Late S/S (BED) → **B**radycardia/**b**radypnea, **e**xtreme restlessness, **d**yspnea; Hypotension, cyanosis
    c. **Confusion is a late sign of hypoxemia**
21. **Oxygen toxicity S/S** → Non-productive cough, substernal pain, nasal congestion, N/V, fatigue, headache, sore throat, bradypnea
22. **Mechanical ventilation alarms** → Remeber **HOLD,** or **high kink, low leak**
    a. **H**igh pressure = **O**bstruction; **L**ow pressure = **D**isconnection
    b. **High pressure alarm** → Excess secretions, biting tube, kinks, coughing, bronchospasm, pneumothorax, pulmonary edema
    c. **Low pressure alarm** → Disconnection, cuff leak, tube displacement
    d. Pt on mechanical ventilation → **Assess breath sounds q1-2hrs**
23. **CPAP** is usually used w/ sleep apnea; **BiPAP** usually used when weaning off vent
24. SOB causes: 4As + 4 Ps
    a. Airway obstruction, angina, anxiety, asthma
    b. Pneumonia, pneumothorax, pulmonary edema, pulmonary embolus
25. **Pneumonia** → Confusion 1st sx in older adults, obtain sputum sample, ↑ calories & fluid (2-3L/day), may hear crackles or wheezes on auscultation; **droplet precautions**
26. **Asthma** → Intermittent and **reversible**, low SaO2, barrel chest, accessory muscles, prolonged exhalation
    a. Peak expiratory flow is the fastest airflow rate reached during exhalation
27. **COPD** → **Irreversible;** Dyspnea upon exertion, productive cough (more severe in morning), hypoxemia, crackles/wheezes, accessory muscles, barrel chest, **hyperresonance** on percussion (air trapping), thin extremities, enlarged neck muscles, decreased SaO2, **respiratory acidosis**, ↓Hct, anorexia, weight loss

a. ABGs will reveal **hypoxemia** ($PaO_2 < 80$), and **hypercarbia** ($PaCO_2 > 45$);
    i. Also can expect elevated HCO_3
b. Both **asthmatics** and **COPD** pts will be on anti-inflammatory meds such as **prednisone**; **Prednisone S/E** → Hyperglycemia, hypokalemia, GI bleed, decrease immune function, mouth sores, fluid retention, weight gain
c. If COPD pt becomes SOB → DO NOT administer O_2

28. **Pulmonary edema** → Expect **pink, frothy sputum**, clammy/cyanotic skin, crackles on auscultation
29. **Uncompensated ABG** →pH is outside the expected reference range, and either the HCO_3 or the $PaCO_2$ is outside the expected reference range
    a. Since EITHER CO_3 or CO_2 is outside expected range, this means the other body system hasn't yet **compensated** for the imbalance
30. **TB** → Cough lasting > 3 wks, night sweats, purulent/bloody sputum, lethargy, wt loss
    a. **Mantoux Test (TB skin test)** results should be read in 48-72 hrs.
        i. Positive result: 10 mm or more; immunocompromised pt - 5 mm or more
        ii. Pt who got BCG vaccine may have false positive result
31. **Pulmonary Embolism (PE)** → Feeling of anxiety/impending doom, pressure in chest, pain upon inspiration and chest wall tenderness, dyspnea, hemoptysis, **pleural friction rub, heart murmur in S3 & S4,** petechiae over chest and axillae, distended neck veins, hypotension, tachycardia
    a. Elevated D-dimer indicates presence of a clot; Administer thrombolytic (Alteplase/Streptokinase)
32. **Pneumothorax** → Lung collapse due to air in the pleural space (Key sx is **hyperresonance w/ percussion**)
    a. Will also have pleuritic pain, reduced breath sounds, absent fremitus
33. **Tension pneumothorax** → Air enters the pleural space during inspiration, but cannot exit during expiration (Key sx is **tracheal deviation**)
34. **Hemothorax** → Blood accumulates in pleural space (Key sx is **dull percussion**)
35. **Flail chest** → Chest wall expansion limited due to multiple fractured ribs (Key sx is **paradoxical chest wall movement**)
36. **Tracheostomy care** (in order) → Remove the inner cannula, remove the soiled dressing, clean the stoma w/ sterile saline, change the tracheostomy collar
37. **Tracheostomy suctioning** → Apply suction for 5-10 secs
    a. Once resistance is met, withdrawal the catheter 1-2cm
    b. Surgical asepsis → When suctioning a newly created tracheostomy
38. **Cardiac tamponade** → Accumulation of fluid in pericardial sac
    a. S/S → **Muffled heart sounds, paradoxical pulse** (variance of 10 mmHg or more in SBP bt inspiration and expiration), hypotension, JVD
    b. Tx → **Pericardiocentesis** (Removal of fluid from pericardial sac)
39. **Hemodynamic monitoring**
    a. **CVP** 2-6 mmHg, **PAWP** 6-15 mmHg, **CO** 3-6 L/min
40. **Coronary Angiogram** → NPO 8hrs prior, assess for iodine/shellfish allergy, assess kidney function
41. **PICC line** → Flush w/ 10 mL (or more) of 0.9% NaCl before, between, and after medications
    a. Blood draws: Withdrawal 10 mL blood and discard, witthdrawl 10 mL blood for sample, flush w/ 20 mL NaCl (or per facility protocol)
42. **Phlebitis** → Erythema, pain, warmth, edema, indurated or cordlike veins, red streak
    a. Card → D/C IV, **warm compress**
43. **Infiltration** → Edema, coolness, taut skin. Tx - D/C IV, **cool compress**, elevation
44. **Bradycardia** dysrhythmias → Administer **atropine**
45. **HTN Complications**: 4 Cs → CAD, CVA, CRF (Chronic renal failure), CHF

46. **aFIB, SVT, vTach w/ pulse** → Admin antidysrhythmic (**amiodarone, adenosine, verapamil**)
47. **L sided HF** (Pulmonary congestion) → Dyspnea, crackles, orthopnea, fatigue, pink/frothy sputum
48. **R sided HF** (Systemic congestion) → JVD, peripheral edema, ascites, hepatomegaly
49. **Pericarditis** → CP (relieved by sitting up &leaning forward), friction rub, SOB, cardiomegaly
50. **Rheumatic endocarditis** → Due to URI from group A beta-hemolytic streptococcal bacteria
    a. **Friction rub**, rash, murmur, CP, fever, joint rash, tachycardia
51. **Infective endocarditis** → Due to streptococcal bacteria. common w/ **IV drug users**
    a. Petechiae (red streaks under nailbeds - ***splinter hemorrhages***), flulike symptoms, murmur
52. **Peripheral arterial disease (PAD)** → Pallor w/ elevation, dependent rubor, leg pain w/ exercise, lack of hair on calves, thick toenails decreased pedal pulses
53. **Venous thromboembolism (VTE)** → **Elevate extremity** (no pillow under knees), warm/moist compress
54. **Venous insufficiency** → Feeling of heaviness in legs, brown discoloration of legs (stasis dermatitis), BLE edema, venous stasis ulcers. Nursing - **elevate legs**
55. **AAA** → Flank/back pain, pulsating abdominal mass
56. **Aortic dissection** → Feeling of "ripping" or "stabbing" in abdomen or back
57. **Thoracic aortic aneurysm** → Severe back pain, SOB, difficulty swallowing, cough
58. **Heart murmur causes**: SPASM
    a. Stenosis of a valve, partial obstruction, aneurysms, septal defect, mitral regurgitation
59. Blood transfusion reactions
    a. **Acute hemolytic** → Low back pain, fever/chills, ↑HR, ↓BP, ↑RR
    b. **Febrile** → Fever/chills, ↑HR, ↓BP (administer **antipyretics**)
60. **Iron deficiency anemia** → Administer iron supplements, ferrous sulfate, iron dextran
61. **Pernicious anemia** → Administer cyanocobalamin (B12) parenterally or intranasally
62. **Fluid volume deficit** → ↑ Hct, serum osmolarity, urine specific gravity, BUN, serum Na
63. **Fluid volume excess** → ↓ Hct/Hgb, serum/urine osmolarity, urine specific gravity, BUN
64. **Metabolic Acidosis** → **DKA**, kidney failure (S/S - **Kussmaul respirations**)
65. **Metabolic Alkalosis** → Antacid overdose, GI losses (vomiting, NG suctioning)
66. **GERD** → Educate pt to elevate HOB 6-8degrees w/ blocks, sleep on R side
67. **Performing gastric lavage w/ NG tube in place** → Ask pt to lie on their left side
    a. Instill 200-300 mL of solution per facility's protocol
68. **Enteral feeding via NG tube** → Keep HOB elevated 45 degrees for 1 hr after
    a. Use 20 mL of tap water to flush the NG tube before & after each feeding
    b. Inject 10-30 mL of air into the NG tube before checking residual to clear the tube of any feeding
    c. To assess correct placement on NG feed tube prior to administration
        i. Aspirate contents from the tube and verify the pH level (want it between 0-4)
69. **Total Parenteral Nutrition (TPN)** → Indicated for malabsorption, hypermetabolic states (i.e. burns), chronic malnutrition, and prolonged NPO
    a. Administration → Via **central line** (i.e. PICC line)
        i. Do not use TPN line for other fluids or meds!!
    b. Nursing considerations → Gradually increase/decrease flow rate
        i. Change tubing and bag q24h and use micron filter on tubing
        ii. **If next TPN bag is unavailable**, administer 10% dextrose in water until it arrives
        iii. Monitor I&O, daily wt, electrolytes, and **blood glucose** (q4-6h for first 24h)
70. **Lactose intolerance** → Avoid puddings, milk, sour cream, cheese, cream soups, coffee creamer, chocolate. S/S include distention, cramps, flatus, diarrhea

71. **Dumping syndrome** → Occurs as a complication of gastric surgeries that inhibit the ability of the pyloric sphincter to control the movement of food into the small intestine
    a. This "dumping" results in **nausea, distention, cramping pains, and diarrhea within 15 mins after eating**
    b. Weakness, dizziness, tachycardia and hypoglycemia may occur
    c. Pt education → Small frequent meals, consume protein and fat at each meal, avoid concentrated sugars, restrict lactose intake, maintain a dry diet (consume liquids 1 hr before or after eating)
72. **Gastric ulcer** → Pain 30-60 min after meal, **worse in DAY**, worse w/ eating
73. **Duodenal ulcer** → Pain 1.5-3 hrs after meal, **worse at NIGHT**, better w/ eating or antacids
74. **Peptic ulcer disease (PUD)** → Characterized by an erosion of the mucosal layer of the stomach or duodenum
    a. Causes: bacterial infection (H. Pylori), chronic use of NSAIDs (ASA, ibuprofen)
    b. Avoid eating frequent meals, alcohol, cigarettes, ASA/NSAIDs, coffee, black pepper, spicy foods, caffeine
75. **Fecal impaction** → Digitally evacuating stool involves inserting a lubricated gloved finger and advance along the rectal wall
76. **IBS** → Avoid dairy, eggs, wheat products, alcohol, caffeine
    a. ↑ fiber (30-40g/day) and ↑ fluid (2-3L/day)
    b. IBS w/ constipation → **Lubiprostone**, IBS w/ diarrhea → **Alosetron**
77. UC &Crohn's education → NPO during exacerbations, eat foods high in protein & calories, **low fiber**
78. **UC** → LLQ pain, fever, 15-20 liquids stools/day, mucus/pus and **blood** in stools
79. **Crohn's Disease** → RLQ pain, 5 loose stools/day, mucus/pus in stools, steatorrhea
80. **Diverticulitis** → High fiber diet, avoid seeds, nuts, popcorn. Watch for **peritonitis**
81. S/S **peritonitis** → N/V, rigid/boardlike abdomen, rebound tenderness, fever, tachycardia. Place in fowlers/high-fowlers position
82. **Cholecystitis** → **RUQ** pain (may radiate to R shoulder)
    a. Cholecystectomy via laparoscopic approach → Should pain is EXPECTED
83. **Pancreatitis** → **LUQ or epigastric pain**, **Turner's sign**, **Cullen's sign**
    a. Turner's sign = Ecchymoses on flanks, Cullen's sign = Blue/grey discoloration around umbilicus
84. Hep A is transmitted via fecal/oral route, Hep B/C transmitted via blood/body fluids
85. **Celiac disease** → Diet should be gluten-free
86. **Total hip arthroplasty** (hip replacement) → Avoid hip flexion >90 degrees, do not cross legs, do not internally rotate the toes, avoid using pillow under knees when lying down
87. **Amputations** → Avoid elevating stump for 24 hrs. Have pt lie prone for 20-30 mins several times a day
88. **Compartment syndrome** - 5 Ps
    a. Pallor, paresthesia, pain, pulse declined or absent, pressure increased (also **edema**)
89. **Osteoporosis** → Risk factors include **sedentary lifestyle**, and estrogen deficiency
90. **Cervical cancer** → Back pain, postcoital bleeding
    a. Pap smear recommended every 3 yrs, starting at 21 y/o
91. **Ovarian cancer** → Abdominal bloating, increase in abdominal girth, pelvic or abdominal pain, early satiety, and urinary frequency or urgency
92. Mammogram → Tests for breast cancer. Recommended annually starting at 40 y/o
    a. Avoid deodorant, lotion, powders in axillary region prior to exam
93. **Leukemia S/S** → Anemia and ↓Hgb, neutropenia, thrombocytopenia
    a. High risk for infection and bleeding

94. **Indications for dialysis** → Acid-base imbalances, electrolyte imbalances, intoxication, overload of fluids, uremic symptom
95. **Arteriovenous (AV) fistula** → **Auscultate the fistula q 4hr for a bruit**, to assess the patency
    a. Pt should keep affected extremity elevated to promote circulation
96. **Continuous bladder irrigation** → Monitor for internal obstruction of the catheter (↓UP and bladder spasms)
    a. Intervention → Irrigate the catheter w/ 0.9% sodium chloride irrigation
97. **Glomerulonephritis** → Immunologic kidney disorder that results in **glomerular injury**
    a. Often develops following an infection
    b. Expected findings → Reddish-brown or cola-colored urine, ↓ GFR, hyperkalemia, hyperphosphatemia, hypocalcemia
        i. **UA showing RBCs and protein**
98. **UTI** → UA reveals presence of bacteria, WBC, **positive leukocyte esterase and nitrites**
99. **Urolithiasis** → Strain all urine
100. **ARF (acute renal failure)** → abrupt, rapid decline in renal function
    a. Usual causes: trauma, sepsis, poor perfusion, or medications
    b. May cause hyponatremia, hyperK, hypoCa, and hyperPhos
    c. Diet therapy is dependent upon the phase of ARF and its underlying cause
101. **Pre-End Stage Renal Disease (pre-ESRD)** also called diminished renal reserve or renal insufficiency → predialysis condition characterized by an increase in serum Creatinine
    a. Goals of nutritional therapy
        i. Help preserve remaining renal function by limiting intake of protein or phosphorus
            1. **Protein restriction is key!!!**
                a. Too little protein results in breakdown of body protein, so protein intake must be carefully determined
            2. Restricting phosphorus intake slows the progression of renal disease
            3. High levels of phosphorus contribute to Ca and phos deposits in kidneys
        ii. Control blood glucose levels and HTN (are both risk factors)
        iii. Slow the progression of renal disease
    b. Dietary recommendations
        i. Limit meat intake, limit dairy products to ½ cup per day
        ii. Limit high-phosphorus foods (peanut butter, dried peas and beans, bran, cola, chocolate, beer, some whole grains)
        iii. Restrict Na intake (to maintain bP)
        iv. Caution pt use vitamin and mineral supplements ONLY when recommended by HCP
102. **End-stage renal disease (ESRD)**
    a. Occurs when the **glomerular filtration rate (GFR) is less than 25 mL/min, serum creat level steadily rises, or dialysis or transplantation is required**
    b. **Goal of nutritional therapy** is to maintain appropriate fluid status, BP, and blood chemistries
    c. Recommended diet
        i. High protein, low phosphorus, low K, low Na, fluid restriction
        ii. Ca and Vit D are nutrients of concern
            1. Vit D deficiency occurs bc the kidneys are unable to convert it to active form
            2. This alters the metabolism of ca, phosphorus, and magnesium
                a. Leads to hyperPhos, hypoCa, and hyperMag
            3. Ca supplements will likely be required bc foods high in phosphorus (which are restricted) are also high in Ca

iii. Protein needs increase once dialysis is begun bc protein and amino acids are lost in the dialysate
iv. 1/2 protein intake shld come from biologic sources (eggs, milk, meat, fish, poultry, fish)
v. Adequate calories (35 cal/kg of body wt) should b consumed to maintain body protein stores
vi. **Phosphorus must be restricted** (high protein leads to increase in Phos intakE)
vii. Phosphate binders must be taken with all meals and snacks
viii. K intake is dependent upon pt lab values
ix. Sodium and fluid allowances are determined by BP, wt, electrolytes, UO
x. National renal diet provides pt with a list of appropriate food choices

103. **Nephrotic syndrome** → results in serum proteins leaking into the urine
    a. Goals of nutritional therapy → minimize edema, replace lost nutrients and minimize permanent renal damage
    b. Dietary recommendation indicate sufficient protein and low Na intake
104. **Nephrolithiasis** (kidney stones)
    a. Primary intervention → ↑ fluid consumption (used for tx and prevention of renal calculi)
    b. Excessive intake of protein, sodium, calcium, and oxalates (rhubarb, spinach, beets) may increase the risk of stone formation
105. **KOH test** → Used to **diagnose fungal skin lesion**
106. **Inhalation damage w/ burns** → Singed eyebrows, nasal hair, and sooty sputum
107. **Burns** → Avoid IM or subq injections
108. **Diabetes insipidus** →
    a. Urine → ↓ Specific gravity (<1.005),↓ osmolality (<200), ↓ sodium
    b. Blood → ↑ osmolality (>300), ↑ sodium
109. **SIADH**
    a. Urine → ↑ specific gravity (>1.030), osmolarity, sodium
    b. Blood → ↓ osmolarity (<270), sodium
110. **Hyperthyroidism** → elevated T3 and T4, **hypothyroidism** → Inadequate T3 and T4
111. **Cushing's syndrome** → Overproduction of cortisol by the adrenal cortex
    a. Increased infections, thin/fragile skin, edema, wt gain (moon face, buffalo hump, increased abdominal girth), HTN, tachycardia, bone pain/fractures, hyperglycemia, gastric ulcers, hirsutism, acne
    b. Diet should be decreased sodium, increased potassium, calcium and protein
112. **Addison's disease** → Inadequate secretion of hormones by adrenal cortex (aldosterone, cortisol, sex hormones)
    a. Weight loss, hyperpigmentation (bronze skin), lethargy, N/V, hypotension, dehydration, hyperkalemia, hypercalcemia, hyponatremia, hypoglycemia
113. **Diabetic foot care** → Apply moisturizer to feet but not between toes, wear cotton socks (no synthetic fabrics), wear leather shoes (or slippers w/ soles), use foot powder w/ cornstarch on sweaty feet, cut nails straight across

MENTAL HEALTH

1. **Mental status exam** (MSE) - all pts should have one (nurse conducts MSE as part of their routine and ongoing assessment)
    a. Include level of consciousness, physical appearence, behavior, cognitive and intellectual abilities
2. 2 types of mental health hospitalizations - voluntary and involuntary (civil commitment)
    a. Involuntary commitment - against the patient's will (unless proven otherwise, pt is still considered competent and have the right to refuse tx)
3. Anxious or depressed → use open-ended, supportive statements
4. Suicidal → use direct, yes or no questions to assess suicide risk
5. Panicked → use gentle guidance and direction
6. Confused → provide reality orientation
7. Delusions, hallucinations, paranoia → acknowledge these, but don't reinforce
8. Obsessive/compulsive behavior → communicate AFTER the compulsive behavior
9. Personality or cognitive disorder → be calm and matter-of-fact
10. Tx for MH illnesses can include meds, talk and behavior therapy and/or brain stimulation
11. Pt undergoing care for MH disorders may feel pressure to deny behavior or issues - they want to appear "normal"
12. Always carefully assess each pt to ensure optimal responses to therapy
13. **Electroconvulsive therapy (ECT)** → Most common type of brain stimulation
    a. Generally performed for depressive disorders, schizophrenia, or acute manic disorder
    b. Most pt receive therapy 3x a week, for 2 to 3 wks
    c. Prior to ECT → carefully screen home meds
        i. LITHIUM, MAOIS, & ALL SEIZURE THRESHOLD MEDS → d/c 2 wk prior to ECT
    d. After therapy → reorient the pt (short term memory loss is common)
        i. Short-term memory loss is an adverse effect of ECT
    e. **Risk for seizure activity DURING the procedure**, but they do not occur after
14. **Anxiety disorders** → generalized anxiety disorder (GAD), panic disorder, phobias, OCD, PTSD
    a. Assess for risk factors, triggers, and responses
15. **Classic symptom of depression** → change in sleep patterns, indecisiveness, decreased concentration, or change in body weight
    a. Any pt who shows these → assess for suicidal ideation
    b. NEVER D/C DEPRESSION MEDS ABRUPTLY
16. **Bipolar disorders** → mood disorders w/ periods of depression and mania
    a. Manic phase → high risk for injury RT decreased sleep, feeling of grandiosity and impulse
        i. Often hospitalized. Provide pt safety
17. Types of abuse → Physical, sexual, emotional
    a. Cycle of abuse - tension building, battering, honeymoon phase
    b. When test questions appear RT abuse, look for the phase to determine the right answr
18. Aggressive or violent pt → Set boundaries and limits on behavior (VERY IMPORTANT!!)
    a. Maintain a calm approach and use short, simple sentences
19. **Antisocial personality disorder** → Will show a lack of remorse
20. **Narcissistic personality disorder** → Likely show sensitivity to rejection
21. **Borderline personality disorder** → Likely to exhibi self-mutilating behaviors (i.e. cutting, substance use, suicidal thoughts)

22. **Neologisms** → Made up words that have no meaning to other but do have meaning to the pt
23. **Word salad** → Jumble words because of an extreme level of disorganization
24. Greatest risk for another suicide attempt → Lack of social support and isolation
25. **Defense mechanisms**

Defense Mechanisms

1. **Altruism** → Dealing w/ anxiety by reaching out to others
2. **Sublimation** → Dealing w/ unacceptable feelings or impulses by unconsciously substituting acceptable forms of expression
3. **Suppression** → Voluntarily denying unpleasant thoughts and feelings
4. **Repression** → Unconsciously putting unacceptable ideas, thoughts, and emotions out of awareness
5. **Regression** → Sudden use of childlike or primitive behaviors that do not correlate w/ the person's current developmental level
6. **Displacement** → Shifting feelings related to an object, person, or situation to another less threatening object, person, or situation
7. **Reaction formation** → Overcompensating or demonstrating the opposite behavior of what is felt
8. **Undoing** → Performing an act to make up for prior behavior
9. **Rationalization** → Creating reasonable and acceptable explanations for unacceptable behavior
10. **Dissociation** → Creating a temporary compartmentalization or lack of connection between the person's identify, memory, or how they perceive the environment
11. **Compensation** → Emphasizing strengths to make up for weaknesses
12. **Identification** → Conscious or unconscious assumption of the characteristics of another individual or group
13. **Intellectualization** → Separation of emotions and logical facts when analyzing or coping w/ a situation or event
14. **Conversion** → Responding to stress through the unconscious development of physical manifestations not caused by a physical illness
15. **Splitting** → Demonstrating an inability to reconcile negative and positive attributes of self or others
16. **Projection** → Attributing one's unacceptable thoughts and feelings onto another who does not have them

PEDIATRICS

Average Temperature Ranges

AGE	TEMPERATURE
Birth-1yr (Axillary)	36.5-37.2 C (97.7-98.9 F)
1-12 yrs (Oral)	36.7-37.7 C (98.1-99.9 F)
12 yrs and up (Oral)	36.6-36.7 C (97.8-98.0 F)

Average Resting Heart Rate

AGE	BPM
birth-1wk	100-160/min
1 wk-3mos	100-220/min
3mos-2yrs	80-150/min
2-12yrs	70-110/min
12 yrs and up	70-110/min

Expected Blood Pressure Ranges for Both Girls & Boys:

Ages	Girls Systolic	Girls Diastolic	Boys Systolic	Boys Diastolic
1 year	83-114	38-67	80-114	34-66
3 years	86-117	47-76	86-120	44-75
6 years	91-122	54-83	91-125	53-84
10 years	98-129	59-88	97-130	58-90
16 years	108-138	64-93	111-145	63-94

Average Resting Respiratory Rates

**newborns may have short periods of apnea, lasting less than 15 secs

AGE	RESPIRATION PER MINUTE
Newborn	30-60/min
newborn-1yr	30/min
1-2 yrs	25-30/min
2-6yrs	21-24/min
6-12yrs	19-21/min
12yrs and up	16-18/min

1. **Pain assessment by age**
    a. 2mos-7yrs → FLACC
    b. 3 yrs and older → FACES
    c. 3yrs-13yrs → Oucher
    d. 5 yrs and older → Numeric scale
    e. 3yrs-18yrs → Non-communicating Children's Pain Checklist
2. **Family composition**
    a. Traditional nuclear → Married couple and their biological childre
    b. Nuclear → 2 parents and their children (biologic, adoptive, step, foster)
    c. Blended → At least 1 stepparent, stepsibling, or half-sibling
    d. Extended → At least 1 parent, 1 child and other individuals either related or not
3. **Stressors in hospitalized children**
    a. **Infant** → Interrupted routines, parental separation, lack of stimulation
        i. Behaviors: Poor feedings, irritability, crying, altered sleep patterns
    b. **Toddler** → Interrupted routines, parental separation, loss of control, fear of being hurt

        i. Behaviors: Protest stage (Crying, fighting, tantrums), despair stage, development regression, refusal to eat, sleep pattern disturbance
    c. **Preschooler** → Pain/bodily injury, parental separation, loss of control
        i. Behaviors: Passiveness, withdrawal, poor appetite, sleep disturbances, magical thinking, bed wetting
    d. **School age children** → Guilty feelings, fear of pain, loss of control, body image changes, falling behind in school, missing school friends
        i. Behaviors: Decreased self esteem, anxiety, fearfulness, stalling, bargaining, stoicism, boredom, withdrawal, sleep disturbances, acting out, anger, crying
    e. **Adolescents** → Body image changes, self-concept disturbances, social isolation, personal identity issues
        i. Behaviors: Anger, aggression, demanding, frustration, withdrawal
4. **Erikson's Stages of Development**
    a. Infant → Trust vs. Mistrust
    b. Toddler (1-3yrs) → Autonomy vs. Shame
    c. Preschooler (3-5yrs) → Initiative vs. Guilt
    d. School-aged (5-12yrs) → Industry vs. Inferiority
    e. Adolescents (12-18yrs) → Identity vs. Role confusion
5. **Administering ear drops** (Ear has 3 letters, remember 3 y/o)
    a. **Younger than 3 y/o** → Pull the pinna **downward** and back
    b. **Older than 3 y/o** → Pull the pinna **upward** and back
6. Preschool-age children respond to rituals that prepare the child for bed such as hearing a story or taking a bath
7. **Vaso-occlusive sickle cell crisis** → Painful swelling of the hands and feet, hematuria, visual disturbances
8. **Tonsillectomy post-op** → Place in lateral or prone position w/ head lower than the chest (functions to avoid aspiration)
    a. Avoid coughing and clearing throat, avoid straws
9. **Pediculosis capitis** → Seal non-washable items in a plastic bag for 2 wks
10. **Organ donation** → Discuss w/ parents separately from discussions about child's impending death
    a. Removal of organs does not damage or violate the body. Can still have open casket
11. **Crib slats** should be no more than 5.7 cm (2.25 in) apart
12. **Snellen letter chart** → Stand 10 ft away
13. **Lead levels** → >45 schedule chelation therapy, >20 contact poison control, >5 contact social services
14. Immunodeficiency patients → Provide high calorie, high protein diet
15. **Peak expiratory flow meter** → Record the **highest** of the 3 readings
16. **Autism Spectrum Disorder** → Use a **reward system** to modify the child's behavior

MATERNAL NEWBORN

1. Cleft Lip: Nursing care plan (post-op) - "CLEFT LIP"
    a. **C**rying try to minimize, **L**ogan bow, **E**lbow restraints, **F**eed w/ Brecht feeder, **T**each feeding techniques, **L**iquid (sterile water) rinse after feeding, **I**mpaired feeding (no sucking), **P**osition - never on abdomen
    b. Average age of repair is 2 mos
2. **Complications of severe preeclampsia** → "HELLP" syndrome
    a. **H**emolysis, **E**levated **L**iver enzymes, **L**ow **P**latelet counts
3. Dystocia: general aspects (maternal) - 4Ps → **P**owers, **P**assageway, **P**assenger, **P**sych
4. **Infections during pregnancy** "TORCH"
    a. Toxoplasmosis, Other (hepB, syphilis, group B beta strep), Rubella, Cytomegalovirus, HSV
5. **IUD: Potential problems w/ use** - "PAINS"
    a. Period (menstrual: late, spotting, bleeding), Abdominal pain, Infection (abdominal vaginal discharge), Not feeling well (fever or chills), String missing
6. Newborn assessment components - "APGAR"
    a. Appearance, Pulse, Grimace, Activity, Respiratory effort
7. Obstetric history - **"GTPAL"** → Gravida, Term, Preterm, Abortions (SAB, TAB), Living children
8. **Oral contraceptives: Signs of potential problems** - "ACHES"
    a. Abdominal pain (possible liver or gallbladder problem), Chest pain or SOB (possible PE), Headache (possible HTN, CVA), Eye problems (possible HTN or vascular accident), Severe leg pain (possible thromboembolic process)
9. **Preterm infant: Anticipated problems** "TRIES"
    a. Temperature regulation (poor), Resistance to infections (poor), Immature liver, Elimination problems (necrotizing enterocolitis), Sensory-perceptual functions (retinopathy)
10. **VEAL CHOP**
    a. Variable decels = Cord compression (intervention: change position)
    b. Early decels = Head compression (NOT a sign of fetal problems)
    c. Accelerations = Okay (we're ok with this - no intervention needed)
    d. Late decels = Placental utero insufficiency (**bad news** and means ↓ fetal oxygenation)
11. **Late decelerations** on FHR monitor → **First step** is to turn mom on her side (**lateral**)
    a. Even if there is a oxytocin infusion, you need to turn on sie before touching IV infusion
12. **Postpartum assessment**: BUBBLEHER
    a. Breasts, uterus, bladder, bowel, lochia, episiotomy, hemorrhoids, emotion, respiratory system
13. Postpartum adaptations
    a. ***Breasts.*** Within the first 24 hours postpartum, colostrum appears and is followed by breast milk within the first 72 hours. Breast engorgement is most likely to occur around day 4 postpartum. The engorged breast will appear full, taut, and even shiny. Although this is normal, it may be very uncomfortable for your client. In contrast, a woman with **mastitis** will usually run a fever higher

than 100° F, report feeling “ill,” and have one breast that's affected (firm, inflamed, swollen, and exquisitely tender to touch). If your client is breastfeeding her newborn, she'll require a breast pump. Depending on the medications ordered, the milk may need to be disposed of and not used for the baby.

b. ***Lochia***. Sometimes women will experience lochia (vaginal discharge) until the time of their 6-week postpartum visit. Immediately after delivery, the lochia is red and heavy enough to require a pad change every 1 to 2 hours.
    i. **By 7 days postpartum**, the lochia should be lighter in color (pink to red) and amount, requiring a pad change every 4 hours.
    ii. **Lochia that becomes heavier, has a foul odor, and is accompanied by pelvic pain** isn't a normal finding and requires immediate intervention.

c. ***Perineal care***. For the first 2 weeks following delivery, clients will need to perform perineal hygiene as taught during the immediate postpartum period.
    i. This may include **perineal water rinses** following elimination using warm water or medicinal rinses, use of sitz baths, and comfort medications to the perineal and anal area.

d. ***Cesarean section***. If your client delivered her baby via cesarean section, continued assessment of the surgical incision is warranted for the **first 2 to 3 weeks postpartum**.
    i. **Redness and warmth around the incision, excessive bruising around the incision, or incisional drainage** requires immediate intervention.
    ii. If the surgeon used staples to close the incision, they're usually removed approximately 5 days post-delivery.

14. **Prolapsed cord** → Knee to chest position!!!
15. **Constipation during pregnancy** → Estrogen and progesterone levels increase during pregnancy, leading to decreased peristalsis and relaxation of the smooth muscles of the intestine, which can result in constipation
    a. Intestine absorbs more water from the stool during pregnancy
    b. Small intestine absorbs iron more readily during pregnancy
    c. 2nd and 3rd trimester, size/weight of growing uterus causes both displacement and compression of the intestines
16. **AVOID ACE INHIBITORS & NSAIDs DURING PREGNANCY**
17. **Stages of labor**
    a. **1st stage** → Onset of labor till full dilation and effacement
        i. Latent phase (0-3 cm) → Mom is usually talkative and eager
        ii. Active phase (4-7 cm) → Restlessness, anxious, helpless
        iii. Transition phase (8-10 cm) → “I can’t go on,” urge to push, rectal pressure
    b. **2nd stage** → Birth of fetus
    c. **3rd stage** → Delivery of placenta
    d. **4th stage** → Maternal stabilization of VS
18. **True labor** → Cervix progressively shortens and thins, and transitions to an anterior position
    a. Contraction intensity increases w/ ambulation and are primarily felt in the lower abdomen & back
19. Postpartum boggy uterus w/ heavy lochia → MASSAGE THE UTERUS to expel clots
20. **Acupressure bands on the wrist** is a type of complementary and alternative therapy that applies pressure to a specific part of the body used to **alleviate nausea and vomiting**
21. **Abruptio placentae** → Persistent uterine contractions, board-like abdomen, dark red vaginal bleeding
22. Severe HTN in antepartum women can trigger seizure activity
23. **Ectopic pregnancy** → **Unilateral stabbing pain** and tenderness in the lower abdominal quadrant
    a. May have referred shoulder pain
24. **Hydatidiform mole** (molar pregnancy) → Primary risk is **hemorrhage**
    a. Bleeding is often **dark brown** (might look like prune juice)

25. **Heat loss**
    a. **Evaporation** (when a liquid converts to a vapor) → Dry newborn right after birth
    b. **Convection** (Flow of heat from the body surface to cooler air) → Maintain room temp at 75.2F
    c. **Conduction** (loss of heat between the newborn's skin and cooler surfaces beneath it) → Use a protective cover on scale when weighing infant
    d. **Radiation** (Loss of heat from the body surfaces to cooler, solid surfaces not in direct contact w/ the newborn, but in relative proximity) → Place the newborn bassinet away from outside windows
26. Assessing adequate intake → Measure number of wet diapers per day (should be 6-8)
27. Infants should be fed at least 8-12x in 24 hrs (about q3hrs)
28. Avoid daily bathing
29. **1 hr glucose tolerance test** → Done at 24-28 wks. Positive result is BG >140 and requires 3hr test
30. **3 hr Oral glucose tolerance test** → Avoid caffeine for 12 hrs prior, fast overnight prior to the test
31. **Nagele's Rule** → LMP + 9 mos + 1 day
32. **Nonstress test** → Reactive = FHR is normal; Non-Reactive = abnormal
33. **Contraction stress test** → We cause contractions by either Oxytocin or nipple stimulation
    a. Monitor FHR and look for **late decelerations**
    b. **Negative CST** is normal finding, **Positive CST** is abnormal
34. **Full bladder** for ultrasound, **empty bladde**r for amniocentesis
35. Basal body temperature → Body temp might decrease slightly just prior to ovulation
36. Measure fundal height starting in 2nd trimester (wk 18-30 fundal height same as gestation wk)
37. **Vacuum-assisted Birth** → Risk for complications of **perineal, vaginal, or cervical lacerations**

38. **Placenta Previa vs. Placental Abruption**

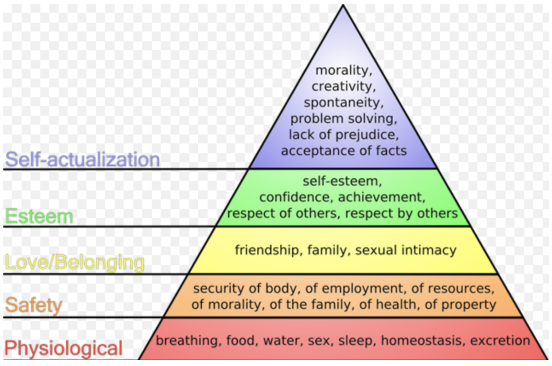
Category	**Placenta Previa**	**Abruptio Placenta**
Problem	Low implantation of the placenta	Premature separation of the placenta
Risk factors	Increased parity, advanced maternal age, past C-section births, past uterine curettage, multiple gestation	High parity, AMA, short umbilical cord, chronic HTN, pregnancy-induced HTN, direct trauma, vasoconstriction from cigarette use
Bleeding	Always present	May or may not be present
Colors of blood in bleeding episodes	Bright red	Dark red
Pain during bleeding	Painless	Sharp, stabbing pain
Management	• Place the woman immediately on bed rest in a side-lying position • Weigh perineal pads • NEVER attempt a pelvic or rectal exam bc it may initiate massive blood loss	• Fluid replacement • O2 by mask • Monitor FHR • Keep woman in a lateral position • DO NOT perform any vaginal or pelvic exams or give enema • **Pregnancy must be terminated** bc the fetus cannot obtain adequate oxygen or nutrients. If birth does not seem imminent, cesarean birth is method of choice for delivery

LEADERSHIP AND COMMUNITY HEALTH

1. **Informed consent** → If pt is unable to give informed consent (i.e. unconscious) and it is an emergency situation, healthcare personnel may proceed w/ necessary life-saving care
    a. Law considers this as implied consent as it is an emergency
2. **Agency for Healthcare Research and Quality** (AHRQ) → Strives to improve the quality of health care services for all populations, including low income and minority groups
3. **Prioritization order**
    a. Treat any immediate threats to patient survival or safety
        i. Obstructed airway, loss of consciousness, psychological episode, anxiety attack, ABCs
    b. Next, treat actual problems
        i. Nausea, full bowel or bladder, comfort measures
    c. Treat relatively urgent actual or potential problems that the patient or family may not recognize
        i. Monitor for post-op complications, anticipating teaching needs of a patient that may be unaware of the S/E
    d. Treat actual or potential problems where help may be needed in the future
        i. Teaching for self-care in the home

> **Scenario**: You are given a report on these 4 patients. Which order will you see them?
> - Patient needing assistance w/ feeding due to hemiparesis
> - Patient on ventilator with a PRN order for tracheal suctioning
> - Patient going to OR for an appendectomy at 0900
> - Patient needing reinforcement of teaching regarding self-administration of insulin
>
> ---
>
> 1. Patient on ventilator → ABCs and safety
> 2. Patient going to OR for an appendectomy → Need to ensure procedure is started on time
> 3. Patient needing assistance w/ feeding → Hunger/thirst come before teaching (according to Maslow)
> 4. Patient needing reinforcement of teaching → Can be seen last

4. **Principles of prioritization** → Systemic before local, acute before chronic, actual before potential, listen don't assume, recognize first and then apply clinical knowledge
5. **Organizational skills** → Make effective and efficient use of time by combining nursing activities
    a. I.e. performing a physical assessment while bathing the patient
6. Most important step in managing time effectively is **PLANNING** (i.e. making a list of activities to complete)
7. Maslow's Hierarchy of needs → Prioritize according to Maslow

a. 

8. **Delegation**
    a. Remember that NEW IS YOU!!! If the questions askes about anything new (new medication, new tracheostomy) then do not delegate this
    b. Nurse reviews following factors when assigning tasks and nursing activities
        i. Individual patient needs, facility policies, job descriptions, specific state nurse practice act and professional standards
    c. RNs are responsible for the supervision of patient care tasks delegated to LPNs and APs
    d. LPNs may delegate to other LPNs and AP

Examples of tasks that can be delegated by the RN

To LPNs	To AP

● Reinforcement of patient teaching
● Monitoring patient clinical manifestations after the initial RN assessment and evaluation
● Tracheostomy care
● Suctioning
● Review patency and placement of a NG tube
● Enteral feeding administration
● Urinary catheter insertion
● Medication administration
  ○ Excluding IV meds - state specific
	● ADLs
	  ○ **Feeding can only be those without swallowing concerns i.e. aspiration precaution**
	● Specimen collection
	● I&O
	● Vital signs (stable patients)

1. Treat any immediate threats to pt survival or safety
    a. Obstructed airway, loss of consciousness, psychological episode, anxiety attack, ABCs
2. Next, treat actual problems → nausea, full bowel or bladder, comfort measures
3. Treat relatively urgent actual or potential problems that the pt or family does not recognize
    a. Monitoring for post-op complications, anticipating teaching needs of a pt that may be unaware of the S/E
4. Treat actual or potential problems where help may be needed in the future
    a. Teaching for self-care in the home

PRINCIPLES OF PRIORITIZATION
- Systemic before local
- Acute before chronic
- Actual before potential
- Listen don't assume
- Recognize first, then apply clinical knowledge

1. Heparin is safe during pregnancy, coumadin is **NOT**
2. Antibiotics w/ risk for ototoxicity
    a. Vancomycin, Erythromycin, Azithromycin, Gentamicin, Tobramycin, Streptomicin
3. Chest Tubes → Continuous bubbling expected in suction control chamber
    a. Continuous bubbling in water seal chamber indicates an air leak
4. Chest tube drainage should be < 70 mL/hr (if more - contact provider)
5. After bronchoscopy a small amount of blood-tinged sputum is expected
6. TB requires airborne precautions; When caring for pt, wear n95 mask
    a. If pt leaves their room, they only have to wear surgical mask
7. Pneumothorax - hyperresonance w/ percussion, tension pneumothorax - tracheal deviation, hemothorax - dull percussion, flail chest - paradoxical chest wall movement
8. Warfarin interactions → Acetaminophen
9. Fiberglass casts are waterproof and water will **NOT** affect integrity of cast but it will cause skin integrity issues
10. SSRIs (Citalopram, Sertraline, Fluoxetine, Paroxetine → Monitor for serotonin syndrome)
    a. Tremors, agitation, confusion, anxiety, hallucinations
    b. **NO** St. John's wort → increases serotonin in body → serotonin syndrome
11. MAOIs (Phenelzine) → Avoid consuming tyramine
    a. Aged cheese, avocados, bananas, red wine, salami/pepperoni, chocolate
12. Pt w/ pacemaker who has hiccups may indicate pacemaker is pacing the diaphragm
13. Stable angina is relieved by rest or NTG, unstable angina occurs w/ exercise or at rest
14. DASH diet → High in fruits, veggies, low-fat dairy, LOW in salt and fat
15. Cholecystitis will have RUQ pain, pancreatitis will have LUQ pain
16. Paracentesis → Void before procedure
17. Abdominal assessment be sure to palpate last
18. Foods containing tyramine include pepperoni, bologna, salami, chocolate, red wine, aged cheese/cheeseburgers, avocados, bananas
    a. Avoid use w/ MAOIs (Phenelzine)
19. Macular degeneration is loss of central vision & Glaucoma is loss of peripheral vision
20. IM injection on obese pt → use the ventrogluteal site
21. Expect weight loss with COPD pt
22. Clonidine → watch for dry mouth
23. Peak expiratory flow meter → Record the HIGHEST of 3 readings **NOT** the average
24. Root cause analysis → investigates deviations from standards of care surround the event