

# Pharmacology Concepts



# Antihypertensives: Adrenergic blocking drugs / Alpha & Beta Central and Peripherally Acting

## How it works? "Action"

**Peripherally acting:** Inhibits norepinephrine in the PNS ( treats BPH, HTN)

**Centrally acting:** Decreases CNS activity (HTN)

## Why do we give it? "Reason"

- Certain cardiac arrhythmias
- BAH
- HTN

## Adverse effects

**EENT:** dry eyes.

**CV:** AV block, bradycardia, hypotension (with epidural), palpitations.

**GI:** dry mouth, constipation, nausea, vomiting.

**GU:** erectile dysfunction.

**Derm:** rash, sweating.

**F&E:** sodium retention, hyperkalemia

**Metab:** weight gain.

**Neuro:** paresthesia.

**Misc:** withdrawal phenomenon

## Nursing management

- Monitor intake and output ratios and daily weight
- Assess for edema daily, especially at beginning of therapy.
- Monitor BP and pulse prior to starting, frequently during initial dose adjustment and dose increases and periodically throughout therapy.
- Titrate slowly in patients with cardiac conditions or those taking other sympatholytic drugs. Report significant changes.
- Transdermal: Instruct patient on proper application of transdermal system. Do not cut or trim unit. Transdermal system can remain in place during bathing or swimming.

## Interactions:

- **Adrenergic:** risk of HTN
- **Levodopa:** hypotension, decrease levodopa
- **Anesthetic agents:** increase anesthetic
- **Beta blockers:** hypertension
- **Lithium:** lithium toxicity
- **Haloperidol:** psychotic behavior

## Contraindications

- **Central:** Hepatic disease ( active ) , MAOI antidepressant therapy
- **Peripheral:** ulcerative colitis , peptic ulcer

Generic	Trade	Central / peripheral	Safe dose	Route
Clonidine	Catapres	Central	100 mcg (0.1 mg) BID	PO, TD
Methyldopa	N/A	Central	250- 500 mg 2- 3 times daily	PO
Doxazosin	Cardura, Cardura XL	Periphera	1 mg once daily	PO
Prazosin	Minipress	Periphera	1 mg 2- 3 times daily	PO

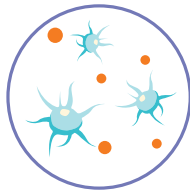
# Antiplatelets

## Abciximab

### Drug name:

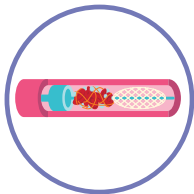
#### Glycoprotein (GP) receptor inhibitors

- Abciximab
- Eptifibatide
- Tirofiban



### Indication:

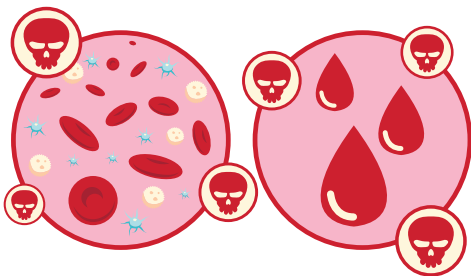
Mainly used after cardiac procedures like heart cath - Coronary Stent Placement to prevent reocclusion



### Adverse Effects:

#### Adverse Effects

- Thrombocytopenia
- Bleeding



### Nursing care:

#### KEY TERM:

##### 1. Assess

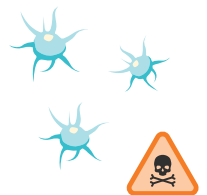
#### HEMOGLOBIN <7



#### PLATELETS <150,000



#### PLATELETS <50,000



##### 2. Assess for bleeding

#### REPORT TO HCP!

- Red tinged urine "hematuria"
- "Dark" tarry stools / Black or bloody stools
- Monitor groin (insertion site) for s/s bleeding



##### 3. Place client on cardiac monitor

#### ECG changes!



##### 4. NO needles!

(no new IV or IM)



### Notes

# Antihypertensives

## Ace Inhibitors

### How it works? "Action"

Suppress the renin-angiotensin-aldosterone system and prevent the activity of ACE which converts angiotensin 1 to angiotensin 2 (vasoconstrictor). Inhibiting the conversion causes Na<sup>+</sup> and H<sub>2</sub>O to not be retained thus sodium and BP will decrease.

### Why do we give it? "Reason"

- Treatment of hypertension

### Adverse effects

**CV:** Orthostatic hypotension, syncope tachycardia, hypotension, chest pain  
**CNS:** Dizziness, fatigue, headache, weakness.  
**GI:** Abdominal pain, diarrhea, nausea, vomiting  
**GU:** Erectile dysfunction, impaired renal function, proteinuria  
**Derm:** Rashes. F and E: hyperkalemia.  
 Misc: ANGIOEDEMA  
**RESP:** Upper respiratory infections and cough,  
**HEMAT:** Neutropenia

### Contraindications

- **ACE1**/Angiotensin receptor blockers: HF, salt or volume depletion, bilateral stenosis, angioedema, pregnancy 2nd/3rd trimester due to neonatal death.

### Nursing management

- Monitor BP and pulse frequently
- Assess patient for signs of angioedema (dyspnea, facial swelling).
- Heart Failure: Monitor weight and assess patient routinely for resolution of fluid overload (peripheral edema, rales/crackles, dyspnea, weight gain, jugular venous distention).
- May cause hyperkalemia.
- Instruct your clients to get up slowly and avoid salt substitutes.

### Interactions:

- **NSAIDs:** Reduced hypotensive effects
- **Rifampin:** Decreased ace1 effects
- **Allopurinol:** Increased risk of hypersensitivity
- **Digoxin:** Decreased dig levels
- **Loop diuretics:** Decrease diuretic effects
- **Lithium:** Possible lithium toxicity
- **Hypoglycemics(insulin):** Increase risk of hypoglycemia
- **Potassium sparing diuretics:** Elevated potassium levels ( hyperkalemia )

### Simple Nursing Brain bits

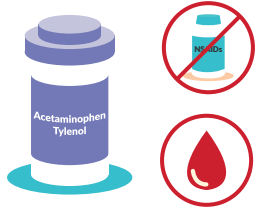
- Be mindful of suffixes! All ACE inhibitors end in "april" Use caution with African American population as drugs may not be effective and/or may cause extremely uncomfortable side effects

Generic	Trade	with/without food	Safe dose	Route
Captopril	Capoten	Without food	12.5– 25 mg 2– 3 times daily	PO
Lisinopril	Prinivil	With food	10 mg once daily	PO
Enalapril	Vasotec	with/ without	2.5– 5 mg once daily	PO , IV
Ramipril	Altace	with/without	2.5 mg once daily	PO

# Acetaminophen Tylenol

## Indication:

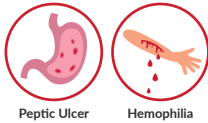
Fever & mild pain. Used instead of NSAIDs to decrease bleeding risk



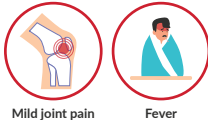
## Key Points:

### A - Absence of BLEEDING

- Like in patients with Peptic Ulcer or Hemophilia



- Mild joint pain or Fever



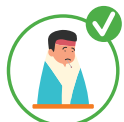
- Another Plus is that Tylenol & NSAIDs can be used interchangeably to reduce fever



- When you reach max dose on one you can use the other



- So it's recommended for child with flu



**A - Alcohol history (Liver Toxic)**

## KEY Term

- Avoid ETOH



## HESI Question

Acetaminophen  
high risk client?

54 year old male who  
**abuses alcohol**



**A - Acetylcysteine = Antidote**

## Memory Trick:

**Acetyl**cysteine **blocks**  
**Acet**aminophen



## ATI question

During an Overdose to  
monitor for which labs?

ALT and AST

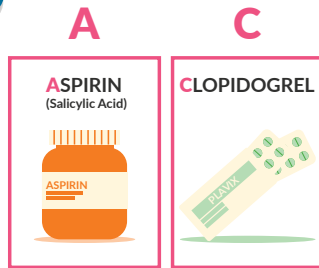


Notes

# Antiplatelets

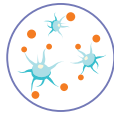
## Acetylsalicylic & Clopidogrel

### Drug name:



### MOA:

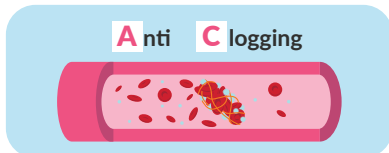
They prevent the platelets from aggregating together. Sort of Spreading platelets out from each other.



### Memory Trick:

**ANTI PLATELETS**

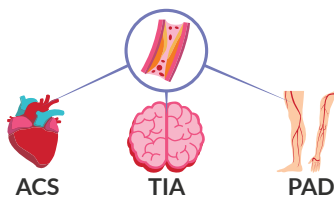
They LOWER platelet aggregation, so we have less chances of them sticking together.



### Indication:

Mainly for Clot prophylaxis

- Heart: MI / CVA prevention
- Narrowed arteries
  - ACS (heart)
  - TIA (brain)
  - PAD (extremities)
- Prevention of stent/bypass re-occlusion



**A C**

ASPIRIN CLOPIDOGREL  
ANTI CLOT

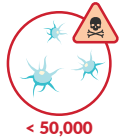
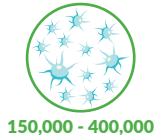


### KEY Numbers

- Hgb < 7 = HEAVEN
- Platelets: (normal 150 - 400K)
  - Less than 150,000 **NOTIFY HCP !!!**
  - Less than 50K **VERY RISKY!!**
- \* These meds **SHOULD NOT** decrease plt levels

### HESI KEY TERM:

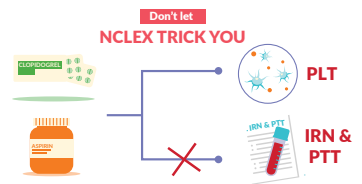
Use for post - PCI  
- percutaneous coronary intervention



### COMMON QUESTION

Platelet count of **75,000 ... or 40,000**  
PRIORITY?

- HOLD** the DRUG
- Question** the prescription
- NOTIFY** the Health Care provider



### Aspirin Toxicity:

#### HESI & ATI Exit Exams

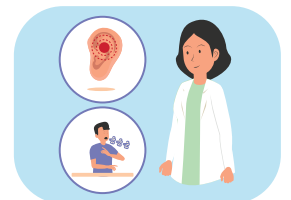
**Treatment:**  
Activated Charcoal

**KEY TERM:**  
Initial treatment of salicylate (Aspirin) toxicity



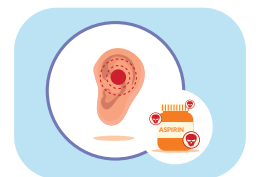
#### KEY SIGNS of Aspirin toxicity

- Tinnitus
- Hyperventilation
- Notify the HCP



### ATI Question

- Long term aspirin  
"Assess for tinnitus"



### Notes

# Acid Neutralizers

## How do they work? "Action"

They neutralize or reduce the acidity of stomach and duodenal contents by combining with HCl and increasing the pH of the stomach acid. They may increase the sphincter tone of the lower esophagus. Examples of antacids include aluminum (Amphojel), magaldrate (Riopan), and magnesium (Milk of Magnesia).

## Why are they used for? "Indications"

- Heartburn, acid indigestion, or sour stomach
- Gastroesophageal reflux disease (GERD)
- Peptic ulcer
- **Aluminum carbonate:** Treats hyperphosphatemia associated with chronic renal failure

## Adverse effects

- **Aluminum-containing antacids:** constipation, intestinal impaction, anorexia, **weakness, tremors, and bone pain**
- **Magnesium:** containing antacids—severe diarrhea, dehydration, and hypermagnesemia (nausea, vomiting, hypotension, decreased respirations)
- **Calcium-containing antacids:** rebound hyperacidity, metabolic alkalosis, hypercalcemia, vomiting, confusion, headache, renal calculi, and neurologic impairment
- **Sodium bicarbonate:** systemic alkalosis and rebound hyperacidity

## Contraindications

- Severe abdominal pain of unknown
- During lactation
- Sodium-containing antacids are contraindicated in patients with cardiovascular problems, such as hypertension or heart failure, and those on sodium-restricted diets.
- Calcium-containing antacids are contraindicated in patients with renal calculi or hypercalcemia.

## Think out of the box

### Sodium bicarbonate

- **Use:** Symptomatic relief of peptic ulcer and stomach hyperacidity
- **Adverse effects:** Electrolyte imbalance and metabolic alkalosis

Sodium bicarb is also given to someone who is in acidosis to bind to the hydrogen ions and balance PH.

## Caution

- Aluminum-containing antacids: gastric outlet obstruction or those with upper GI bleeding.
- Magnesium- and aluminum-containing antacids: decreased kidney function.
- Calcium-containing antacids: respiratory insufficiency, renal impairment, or cardiac disease.
- Antacids are classified as pregnancy category C drugs and should be used with caution during pregnancy

## Interactions:

- **Digoxin, isoniazid, phenytoin, and chlorpromazine:** Decreased absorption of the interacting drugs results in a decreased effect of those drugs
- **Tetracycline:** Decreased effectiveness of anti-infective
- **Corticosteroids:** Decreased anti-inflammatory properties
- **Salicylates:** Pain reliever is excreted more rapidly in the urine

## Nursing management

- Because of the possibility of an antacid interfering with the activity of other oral drugs, no oral drug should be administered within 1 to 2 hours of an antacid.
- When one of these drugs is given IV, monitor the rate of infusion at frequent intervals. Too rapid an infusion may induce cardiac arrhythmias.
- Keep a record of the patient's bowel movements, because these drugs may cause constipation or diarrhea.
- Observe the patient for signs of dehydration, which include poor skin turgor, dry mucous membranes, decrease in or absence of urinary output, concentrated urine, restlessness, irritability, increased respiratory rate, and confusion.
- Instruct the patient to chew the tablets thoroughly before swallowing and then drink a full glass of water or milk.
- Magnesium-containing products may produce a laxative effect and may cause diarrhea; aluminum- or calcium-containing antacids may cause constipation.
- Taking too much antacid may cause the stomach to secrete excess stomach acid. Consult the primary health care provider or pharmacist about appropriate dose. Do not use the maximum dose for more than 2 weeks, except under the supervision of a primary health care provider.

Generic	Trade	Use	Dose
<b>Aluminum carbonate</b>	Basaljel	Symptomatic relief of peptic ulcer and stomach hyperacidity, hyperphosphatemia	2 tablets or capsules (10 mL of regular oral suspension) as often as q 2 hr, up to 12 times daily
<b>Calcium carbonate</b> (May cause acid rebound)	Caltrate	Symptomatic relief of peptic ulcer and stomach hyperacidity, calcium deficiencies (osteoporosis)	0.5–1.5 g orally
<b>Magnesia</b> (magnesium hydroxide)	Milk of Magnesia	Symptomatic relief of peptic ulcer and stomach hyperacidity, constipation	Antacid: 622–1244 mg (5–15 mL in suspension) orally QID Laxative: 15–60 mL orally

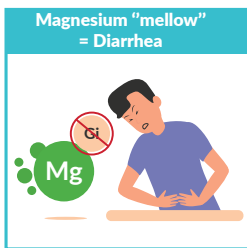
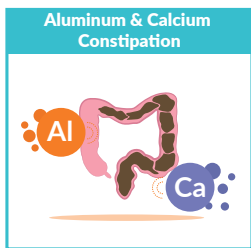
# Acid Prevention

## Antacid, H2 Blockers & PPI

### Antacid:

<b>S</b>	Sodium Bicarbonate (brand: Alka-selzer)
<b>C</b>	Calcium Carbonate (brand: Tums, Rolaids)
<b>A</b>	Aluminum Hydroxide
<b>M</b>	Magnesium Hydroxide (brand: Milk of Mag)

### Side Effects:



### MOA:

Immediately neutralizes stomach acid, but ONLY temporary (NOT long lasting)

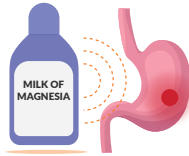


IT DOESN'T  
LAST LONG

### HESI Question

#### Magnesium hydroxide

Can upset stomach +  
Liquid bowel movements



### KEY POINTS & MEMORY TRICK

- **Anti** -Acids
- **Anti** -MIXING with other MEDs
- 1 hour **BEFORE** or **AFTER** OTHER MEDs !
- **NOT** for heart failure!
  - Nothing **OTC** "over the counter"
  - Sodium = Swells

### H2 Blockers:

- **"-tidine"**
- **Ranitidine**  
(brand: Zantac)
- **Famotidine**  
(brand: Pepcid)



### Indication:

GERD & Ulcers  
(duodenal & gastric) prevention

### MOA:

Reduces gastric secretions by  
BLOCKING H2O receptors in  
the stomach



### Patient Education:

- No over eating
- No stress/smoking
- No NSAIDS + Asa - GI bleeds



### KEY POINTS & MEMORY TRICK

**30 MIN BEFORE MEALS**



### PPI:

#### Proton Pump Inhibitor "-prazole"

- **Omeprazole**  
(brand: Prilosec)
- **Esomeprazole**  
(brand: Nexium)
- **Pantoprazole**  
(brand: Protonix)

### MOA:

Inhibits proton pump in the parietal cells of the  
stomach to reduce gastric acid



### Key Terms:

Stress ulcer  
prophylaxis  
in hospitalized  
/surgical  
patients

### KEY POINTS & MEMORY TRICK

P	P	P	P
<b>Prazole</b> 	Prevents holes <b>"Stress ulcer prophylaxis"</b> 	Porous Bones <b>"regular bone density tests"</b> 	Possible GI infections <b>"C-Diff"</b> 

### Indication:

Stress ulcer prevention,  
GERD, heart-burn

# Acid Reducers

## - Proton Pump Inhibitors

### How do they work? "Action"

These drugs suppress gastric acid secretion by inhibition of the hydrogen-potassium adenosine triphosphatase (ATPase) enzyme system of the gastric parietal cells. The ATPase enzyme system is also called the acid (proton) pump system. The proton pump inhibitors suppress gastric acid secretion by blocking the final step in the production of gastric acid by the gastric mucosa. Think of it as putting a cap on a volcano so it doesn't erupt!

### Why are they used for? "Indications"

- Gastric and duodenal ulcers (specifically associated with H. pylori infections)
- GERD and erosive esophagitis
- Pathologic hypersecretory conditions
- Prevention of bleeding in high-risk patients using antiplatelet drugs

An important use of these drugs is combination therapy for the treatment of H. pylori infection in patients with duodenal ulcers. One treatment regimen used to treat infection with H. pylori is a triple-drug therapy, such as one of the proton pump inhibitors (e.g., omeprazole or lansoprazole) and two anti-infectives (e.g., amoxicillin and clarithromycin). (Ford 2006)

### Adverse effects

- Headache, nausea, diarrhea, and abdominal pain.

### Contraindications

- Hypersensitivity
- lansoprazole, rabeprazole, and pantoprazole (pregnancy category B) are contraindicated during pregnancy and lactation.

### Caution

- Older adults
- patients with hepatic impairment.
- Prolonged treatment may decrease the body's ability to absorb vitamin B12, resulting in anemia.
- Omeprazole (pregnancy category C)

### Critical Thinking

#### • Menopausal Women

An increase in fractures of the hip, wrist, and spine have been seen in those taking high doses of proton pump inhibitors and undergoing treatment of osteoporosis with bisphosphonates.

### Interactions:

- **Sucralfate:** Decreased absorption of the proton pump inhibitor
- **Ketoconazole and ampicillin:** Decreased absorption of the anti-infective
- **Oral anticoagulants:** Increased risk of bleeding
- **Digoxin:** Increased absorption of digoxin
- **Benzodiazepines, phenytoin:** Risk for toxic level of antiseizure drugs
- **Clarithromycin (with omeprazole, specifically):** Risk for an increase in plasma levels of both drugs
- **Bisphosphonates:** Increased risk of fracture

### Nursing management

- Because of the possibility of an antacid interfering with the activity of other oral drugs, no oral drug should be administered within 1 to 2 hours of an antacid.
- When one of these drugs is given IV, monitor the rate of infusion at frequent intervals. Too rapid an infusion may induce cardiac arrhythmias.
- Keep a record of the patient's bowel movements, because these drugs may cause constipation or diarrhea.
- Observe the patient for signs of dehydration, which include poor skin turgor, dry mucous membranes, decrease in or absence of urinary output, concentrated urine, restlessness, irritability, increased respiratory rate, and confusion.
- Instruct the patient to chew the tablets thoroughly before swallowing and then drink a full glass of water or milk.
- Magnesium-containing products may produce a laxative effect and may cause diarrhea; aluminum- or calcium-containing antacids may cause constipation.
- Taking too much antacid may cause the stomach to secrete excess stomach acid. Consult the primary health care provider or pharmacist about appropriate dose. Do not use the maximum dose for more than 2 weeks, except under the supervision of a primary health care provider.

Generic	Trade	Use	Dose
esomeprazole	Nexium	Erosive esophagitis, GERD, H. pylori eradication, NSAID-associated gastric ulcers	20–40 mg/day orally
omeprazole	Prilosec	Same as esomeprazole, hypersecretory conditions, heartburn, reduce risk of upper GI bleeding	20–60 mg/day orally
pantoprazole	Protonix	GERD, erosive esophagitis and hypersecretory conditions	40 mg/day orally or IV Hypersecretion: 80 mg IV q 12 hr
lansoprazole	Prevacid	Same as esomeprazole, hypersecretory conditions, cystic fibrosis (intestinal malabsorption)	15–30 mg/day orally

# Adenosine

## Drug name:

Adeno**SINE**

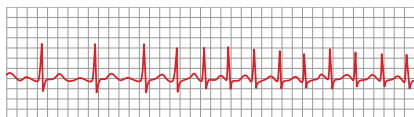
### MEMORY TRICK



Puts the HR Down  
in a **DEN** with a **DEN**osine

## MOA:

It works by slowing impulse conduction through the AV node to slow down the heart rate. Therefore can work too well & stop the heart all together - so SAFETY is the main concern.



## Common TEST Question

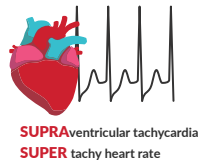
Which **drug** does the nurse anticipate the provider will order?

✓Ⓐ Adenosine



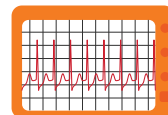
## Indication:

1st line drug to treat  
- **supraventricular tachycardia**



**SUPRA**ventricular tachycardia  
**SUPER** tachy heart rate

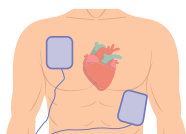
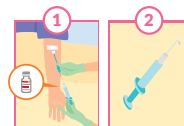
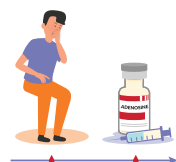
150 beats/min



## KEY Points

### SVT ORDER of treatment

1. Vasovagal maneuver **FIRST!**  
**BEFORE** adenosine (bearing down like having a **BOWEL MOVEMENT**)
2. Adenosine **IV push "rapidly over 1-2 seconds"** followed by a saline flush
3. Cardioversion to Convert the heart rhythm - "Push the **SYNCHRO-NIZE BUTTON**" for Cardioversion



CARDIOVERSION



Don't let

THE NCLEX TRICK YOU



DEFIBRILLATION

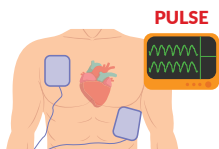
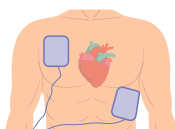
## Cardioversion

**C** - Cardioversion

**C** - Count a pulse

**C** - Controlled Rhythms

Synchronized button & sedation



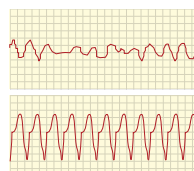
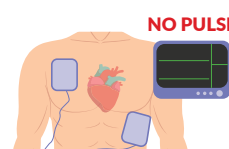
## Defibrillation

**D** - Defibrillation - if you

**D** - Don't have a pulse

**D** - Deadly rhythms (VFib & Vtach no pulse)

**D** - Don't Synch (shock away!)



# CNS Stimulants

## - Amphetamines

### How do they work? "Action"

Amphetamines are sympathomimetic "adrenergic". Which means that they mimicking a response from the sympathetic nervous system, causing the CNS to speed up, resulting in :

- Elevated blood pressure
- Wakefulness
- Increased or decreased pulse rate

### Indications

- ADHD
- Drug-induced respiratory depression
- Post Anesthesia respiratory depression, without reduction of analgesia
- Narcolepsy
- Obstructive sleep apnea
- Exogenous obesity
- Fatigue (caffeine)

### Adverse Reactions

- Excessive CNS stimulation, headache, dizziness
- Apprehension, disorientation, hyperactivity
- Nausea, vomiting, cough, dyspnea
- Urinary retention, tachycardia, palpitations

### Contraindications

- Known hypersensitivity
- Convulsive disorders
- Ventilation disorders ( COPD)
- Cardiac problems
- Hypertension
- Hyperthyroidism
- Glaucoma
- Pregnancy

### Interactions

- **Anesthetics:** Increased risk of cardiac arrhythmias
- **Theophylline:** Increased risk of hyperactive behaviors
- **Oral contraceptives:** Decreased effectiveness of oral contraceptive when taken with modafinil

### Nursing management

- An increased risk of suicidal ideation in children and adolescents has been found when using the drug atomoxetine (Strattera). Patients with ADHD started on atomoxetine should be monitored carefully for suicidal thoughts or behaviors.
- Stimulants enhance dopamine transmission to areas of the brain that interpret well-being. To maintain pleasurable feelings, people continue the use of stimulants, which leads to their abuse and the potential for addiction.
- Older adults are especially sensitive to the effects of the CNS stimulants and may exhibit excessive anxiety, nervousness, insomnia, and mental confusion. Cardiovascular disorders, common in the older adult, may be worsened by the CNS stimulants. Careful monitoring is important because these reactions may result in the need to discontinue use of the drug.
- **ADHD:** Give the drug in the morning 30 to 45 minutes before breakfast and before lunch. Do not give the drug in the late afternoon.
- **Narcolepsy:** Keep a record of the number of times per day that periods of sleepiness occur, and bring this record to each visit to the primary health care provider or clinic.
- **Amphetamines and anorexiant:** These drugs are taken early in the day to avoid insomnia. Do not increase the dose or take the drug more frequently, except on the advice of the primary health care provider.
- **Caffeine (oral, nonprescription):** Over-the-counter caffeine preparations should be avoided if the individual has a history of heart disease, high blood pressure, or stomach ulcers.

Generic	Trade	Use	Dose
Amphetamine	N/A	Narcolepsy, ADHD, exogenous obesity N	Narcolepsy: 5–60 mg/day orally in divided doses ADHD: 5 mg BID, increase by 10 mg/wk until desired effect.
Dexmethylphenidate	Focalin	ADHD	2.5 mg orally BID; maximum dosage, 20 mg/day
Methamphetamine	Desoxyn	ADHD, exogenous obesity	ADHD: up to 25 mg/day orally Obesity: 5 mg orally 30 min before meals

# ADHD Meds

## Drug names:

### Methylphenidate

(brand: Ritalin)

### Amphetamine mixture

(brand: Adrenal)

### Dextroamphetamine

### Stimulants



## Indication:

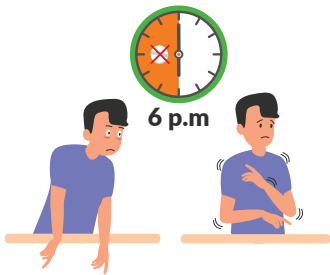
Given to treat:

ADHD in children & adolescents  
& even narcolepsy



## KEY POINT

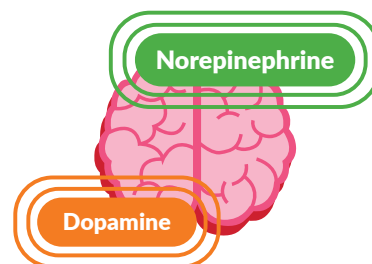
- Loss of Appetite & Weight
- Loss of Sleep
  - Restlessness
  - Give last dose NO LATER than 6 PM
- Improvements in school work
- PRIORITY nursing assessments
  - Monitor BP
  - MONITOR and report height, weight trends with HCP
- Reversal Agent: Alprazolam



PRIORITY nursing assessment

## MOA:

Enhance effects of dopamine and norepinephrine in brain



## Notes

# Antihypertensives: Adrenergic blocking drugs - Alpha

## How it works? "Action"

Block Alpha receptors causing **vasodilation** by relaxing the smooth muscle of the blood vessels. In ophthalmic preps they constrict the pupil.

## Why do we give it? "Reason"

- Hypertension caused by pheochromocytoma
- Hypertension caused by pre op prep.
- Treat tissue damage caused by dopamine injection.

## Adverse effects

**CNS:** CEREBROVASCULAR SPASM, dizziness, weakness.

**EENT:** nasal stuffiness.

**CV:** HYPOTENSION, MI, angina, arrhythmias, tachycardia.

**GI:** abdominal pain, diarrhea, nausea, vomiting, aggravation of peptic ulcer.

**Derm:** flushing. Local: injection site pain (local).  
Interactions

## Contraindications

- Coronary artery disease

## Nursing management

- Monitor BP, pulse, and ECG every 2 min until stable during IV administration. If hypotensive crisis occurs, epinephrine is contraindicated and may cause paradoxical further decrease in BP.
- Norepinephrine may be used
- Instruct client to change positions slowly to minimize orthostatic hypotension.
- Instruct patient to notify health care professional if chest pain occurs during IV infusion.

## Interactions:

- **Epinephrine or methoxamine:**  
Severe hypotension
- **Ephedrine or phenylephrine:**  
Decreased pressor response

## Simple Nursing Brain bits

If you are giving multiple meds remember, If it makes you hyper or shaky check the drug book before administering it with Alpha Adrenergic blockers

Generic	Trade	Safe Dose	Route
Phentolamine	Oraverse, Regitine	5 mg given 1- 2 hr pre op, repeated PRN. can infuse at 0.5- 1 mg/min during surgery.	IM, IV, Local

# Antihypertensives: Adrenergic blocking drugs - Alpha & Beta

## How it works? "Action"

Block Alpha receptors causing **vasodilation** by relaxing the smooth muscle of the blood vessels in ophthalmic preps they constrict the pupil

## Why do we give it? "Reason"

- Carvedilol: essential HTN, HF to reduce progression
- Labetalol: HTN usually as an adjunct to a Diuretic

## Adverse effects

**CNS:** Dizziness, fatigue, weakness, anxiety, depression, drowsiness, insomnia, memory loss, mental status changes, nervousness, nightmares.

**EENT:** Blurred vision, dry eyes, intraoperative floppy iris syndrome, nasal stuffiness.

**Resp:** bronchospasm, wheezing.

**CV:** BRADYCARDIA, HF, PULMONARY EDEMA

**GI:** diarrhea, constipation, nausea. GU: erectile dysfunction, pibido.

**Derm:** STEVENS-JOHNSON SYNDROME, TOXIC EPIDERMAL NECROLYSIS, itching, rashes, urticaria.

**Endo:** hyperglycemia, hypoglycemia.

**MS:** arthralgia, back pain, muscle cramps.

**Neuro:** paresthesia.

**Misc:** ANAPHYLAXIS, ANGIOEDEMA, drug-induced lupus syndrome.

## Nursing management

- Monitor BP, pulse, and ECG every 2 min until stable during IV administration. If hypotensive crisis occurs, epinephrine is contraindicated and may cause paradoxical further decrease in BP. Norepinephrine may be used
- Instruct client to change positions slowly to minimize orthostatic hypotension.
- Instruct patient to notify health care professional if chest pain occurs during IV infusion

## Interactions:

- **Antidepressants:** tremors
- **Cimetidine:** increased adrenergic blocker effect
- **Clonidine:** increase clonidine effects
- **Digoxin:** digoxin toxicity

## Contraindications

- History of serious hypersensitivity reaction.
- Stevens-Johnson syndrome, angioedema, anaphylaxis
- Pulmonary edema
- Cardiogenic shock
- Bradycardia, heart block or sick sinus syndrome
- Uncompensated HF requiring IV inotropic agents (wean before starting carvedilol); Severe hepatic impairment; Asthma or other bronchospastic disorders.

Generic	Trade	Safe Dose	Route
Carvedilol	Coreg, Coreg CR	6.25 mg twice daily	PO
Labetalol	Trandate	100 mg twice daily	PO, IV

# Upper Respiratory Drugs

## Cough Expectorants

### Drug name:

**Guaifenesin**  
(brand: mucinex)

#### KEY POINTS

- Increase fluid intake
- Drink at least 2 L / day
- **Asthma Safe**

### Indication:

Helps patient to cough out excess secretions

#### MOA:

Thins the mucus



### Drug name:

**Acetylcysteine**  
(brand: mucomyst)

**Antidote:** Acetaminophen (Tylenol) poisoning

#### KEY POINT

**NOT SAFE**  
Cause or **Worsen** bronchospasm!

### Memory Trick:

**A** - Acetylcysteine

**A - AVOID** asthma patients



## Cough Suppressant "Antitussive"

**Codeine**

#### KEY POINT

1. Slow position changes!!!
2. NOT for COPD
3. Take with food!!!
4. Increase fluid intake!
5. 8 full glasses of water (minimum)



## DON'T LET NCLEX TRICK YOU

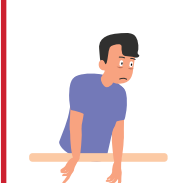
**NOT**  
Photosensitivity



**NOT**  
Heart Palpitations



**NOT**  
Insomnia or Anxiety



## Antihistamine "allergy meds"

### Drug name:

**Diphenhydramine**  
(Brand: Benadryl)

#### Contraindicated:

- Closed angle glaucoma
- Urinary retention
- Peptic ulcer
- Small bowel obstruction



### Indication:

For anaphylaxis (big allergic reactions)

#### MOA:

Blocks histamine which creates inflammation

### Drug name:

**Loratadine**  
(brand: Claritin)

Fewer sedation effects



### Drug name:

**Fexofenadine**  
(brand: Allegra)

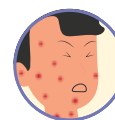
#### KEY POINT

**NOT for Glaucoma**

Due to anticholinergic effects that increase intraocular pressure



Sinusitis



Allergies



Hives

# Uric Acid

## Allopurinol & Colchicine

### Indication:

Given for Gout - uric acid build up causes inflammation in the joints



### BIG KEY DIFFERENCE

Allo**P**urinol - **P**revents gout

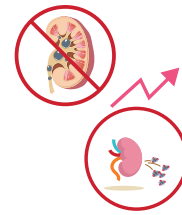
**C**olchicine - for a**C**ute gout attacks

**NOT** given to reduce pain, but to reduce uric acid



### Patient Teaching:

- Increase fluids & take with full glass of water
- AVOID clients with Kidney & Liver Disease
- Evaluation of effectiveness?  
= Normal uric acid levels



### HESI Question

- Allopurinol** - Do not take for acute gout attacks
- Colchicine** - for acute attack, DOES NOT provide pain relief
- Naproxen (NSAID)** - used for PAIN relief with gout.



### KEY POINTS:

#### Allopurinol

1. **STOP** taking = MILD rash  
& report to the HCP immediately **NCLEX TIP**

#### MEMORY TRICK

- Rash **ALL** Over
- **ALL**opurinol = Deadly

2. Increase fluids
3. Take with full glass of water



### KAPLAN Question

"I can use ibuprofen for pain ... Gout"



### HESI Question

Needs **FURTHER teaching** when taking Allopurinol

"I will **limit** my **fluid intake** with this medication"



### Notes

# PNS Drugs

## - A/B Blocking Drugs

### How do they work? "Action"

$\alpha/\beta$ -Adrenergic blocking drugs block the stimulation of both the  $\alpha$ - and  $\beta$ -adrenergic receptors, resulting in peripheral vasodilation. The two drugs in this category are carvedilol (Coreg) and labetalol (Trandate). (Ford 256)

### Indications

- **Carvedilol** is used to treat essential hypertension and in HF to reduce progression of the disease.
- **Labetalol** is used in the treatment of hypertension, either alone or in combination with another drug, such as a diuretic. (Ford 256)

### Adverse Reactions

General body system adverse reactions include fatigue, dizziness, hypotension, drowsiness, insomnia, weakness, diarrhea, dyspnea, chest, pain, bradycardia, and skin rash. (Ford 256)

### Contraindications

- Hypersensitivity to the drugs bronchial asthma
- Decompensated HF
- Severe bradycardia

### Interactions

- **Antidepressants (tricyclics and SSRIs):** Increased risk of tremors
- **Cimetidine:** Increased effect of the adrenergic blocker
- **Clonidine:** Increased effect of the clonidine
- **Digoxin:** Increased serum level of the digoxin and higher risk of digoxin toxicity (Ford 256)

### Nursing Alert

When administering a sympatholytic drug, such as propranolol (Inderal), take an apical pulse rate and blood pressure before giving the drug. If the pulse is below 60 beats/min, or if there is any irregularity in the patient's heart rate or rhythm, or if systolic blood pressure is less than 90mm Hg, withhold the drug and contact the primary health care provider. (Ford 258)

### Nursing management

- Do not stop taking the drug abruptly, except on the advice of the primary health care provider. Most of these drugs require that the dosage be gradually decreased to prevent precipitation or worsening of adverse effects.
- Notify the primary health care provider promptly if adverse drug reactions occur.
- Observe caution while driving or performing other hazardous tasks because these drugs ( $\beta$ -adrenergic blockers) may cause drowsiness, dizziness, or lightheadedness.
- Immediately report any signs of HF (weight gain, difficulty breathing, or edema of the extremities).
- Do not use any nonprescription drug (e.g., cold or flu preparations or nasal decongestants) unless you have discussed use of a specific drug with the primary health care provider.
- Inform dentists and other primary health care providers of therapy with this drug.
- Keep all primary health care provider appointments because close monitoring of therapy is essential.
- Check with a primary health care provider or clinical pharmacist to determine if the drug is to be taken with food or on an empty stomach. (Ford 259-260)

Generic	Trade	Use	Dose
<b>Carvedilol</b>	Coreg	Hypertension, HF, left ventricular dysfunction	6.25–25 mg orally BID
<b>Labetalol</b>	Trandate	Hypertension	200–400 mg/day orally in divided doses IV: 20 mg over 2 min with blood pressure monitoring, may repeat

# PNS Drugs

## - Alpha Adrenergic Blockers

### How do they work? "Action"

Stimulation of  $\alpha$ -adrenergic nerves results in vasoconstriction. If stimulation of  $\alpha$ -adrenergic nerves is interrupted or blocked, the result is vasodilation.

### Indications

- Hypertension caused by pheochromocytoma (a tumor of the adrenal gland that produces excessive amounts of epinephrine and norepinephrine)
- Hypertension during preoperative preparation
- They are also used to prevent or treat tissue damage caused by extravasation of dopamine.

### Adverse Reactions

- weakness, orthostatic hypotension
- cardiac arrhythmias, hypotension, and tachycardia.

### Contraindications

- Hypersensitivity
- Coronary artery disease

### Nursing management

- Do not stop taking the drug abruptly, except on the advice of the primary health care provider. Most of these drugs require that the dosage be gradually decreased to prevent precipitation or worsening of adverse effects.
- Notify the primary health care provider promptly if adverse drug reactions occur.
- Observe caution while driving or performing other hazardous tasks because these drugs ( $\beta$ -adrenergic blockers) may cause drowsiness, dizziness, or lightheadedness.
- Immediately report any signs of HF (weight gain, difficulty breathing, or edema of the extremities).
- Do not use any nonprescription drug (e.g., cold or flu preparations or nasal decongestants) unless you have discussed use of a specific drug with the primary health care provider.
- Inform dentists and other primary health care providers of therapy with this drug.
- Keep all primary health care provider appointments because close monitoring of therapy is essential.
- Check with a primary health care provider or clinical pharmacist to determine if the drug is to be taken with food or on an empty stomach. (Ford 259-260)

### Interactions

None listed.

Generic	Trade	Use	Dose
<b>Phentolamine</b>	Regitine	Diagnosis of pheochromocytoma, hypertensive episodes before and during surgery, prevention/treatment of dermal necrosis after IV administration of norepinephrine or dopamine	5 mg IV, IM Tissue necrosis: 5–10 mg in 10 mL saline solution infiltrated into affected area

# Anti Infectives

## - Aminoglycosides

### How do they work? "Action"

The aminoglycosides exert their bactericidal effect by blocking the ribosome from reading the mRNA, a step in protein synthesis necessary for bacterial multiplication.

### Indications

- Infections caused by gram negative organisms
- Before abdominal surgery to reduce normal flora in the bowel

### Adverse Reactions

- Nausea
- Vomiting
- Anorexia
- Rash
- Urticaria
- Nephrotoxicity
- Ototoxicity
- Neurotoxicity

### Contraindications & Caution

- Hypersensitivity
- Pre existing Hearing loss
- Myasthenia gravis
- Parkinsonism
- Pregnancy & lactation

### Nursing management

- Before administering any antibiotic be sure to evaluate the results of the culture and sensitivity test.
- Take the drug at the prescribed time intervals. These time intervals are important because a certain amount of the drug must be in the body at all times for the infection to be controlled..
- Always report serious adverse reactions, such as a severe hypersensitivity reaction, respiratory difficulty, severe diarrhea, or a decided drop in blood pressure, to the primary health care provider immediately, because a serious adverse reaction may require emergency intervention.
- Monitor temperature and evaluate the effectiveness of the treatment via labs and vitals.
- Neuromuscular blockade or respiratory paralysis may occur with the administration of aminoglycosides. It is imperative to monitor respiratory status and report any respiratory difficulty immediately.
- To detect ototoxicity, carefully evaluate the patient's complaints or comments related to hearing, such as a ringing or buzzing in the ears.

### Interactions:

- Cephalosporins: Increased risk of nephrotoxicity
- Loop diuretics (water pills): Increased risk of ototoxicity
- Pavulon or Anectine (general anesthetics): Increased risk of neuromuscular blockade

### Favorable Outcomes

- Patient reports comfort without fever.
- Orientation and mentation remain intact.
- Patient has adequate renal tissue perfusion.
- No evidence of injury is seen due to visual or auditory disturbances.
- Patient does not experience diarrhea. (Ford 91)

Generic	Trade	Use	Dose
Gentamicin	N/A	Treatment of serious infections caused by susceptible strains of microorganisms	3 mg/kg/day in 3 divided doses IM or IV For life-threatening infection: 5 mg/kg/day in divided doses
Streptomycin	N/A	Treatment of serious infections caused by susceptible strains of microorganisms	15 mg/kg/day IM or 25-30 mg/kg IM 2-3 times per week
Tobramycin	N/A	Treatment of serious infections caused by susceptible strains of microorganisms PLUS TREATMENT OF TB	3-5 mg/kg/day IM, IV in 3 equal doses

# Aminosalicylates

## How do they work? "Action"

Exert a topical anti-inflammatory effect in the bowel. The exact mechanism of action of these drugs is unknown.

## Why are they used for? "Indications"

The aminosalicylates are used to treat Crohn's disease and ulcerative colitis as well as other inflammatory diseases.

## Adverse Reactions

- Abdominal pain
- Nausea
- Diarrhea.
- Headache
- Dizziness
- Fever
- Weakness.

## Contraindications

- Known hypersensitivity
- hypersensitivity to sulfonamides and sulfites
- Intestinal obstruction
- Children younger than 2 years.

## Caution

Aminosalicylates are pregnancy category B drugs (except olsalazine, which is in pregnancy category C); all are used with caution during pregnancy and lactation (safety has not been established). (Ford 436)

## Interactions

- **Digoxin:** Reduced absorption of digoxin
- **Methotrexate:** Increased risk of immunosuppression
- **Oral hypoglycemic drugs:** Increased blood glucose level
- Warfarin: Increased risk of bleeding

## Nclex Tip

Hypoactive bowel sounds in severe cases of obstipation (liquid stool leaked around the fecal mass, presenting as loose stool) are evidence that the patient is constipated, which would indicate very different drug therapy. (Ford 439)

## Nursing management

- Review the patient's chart for the course of treatment and find the reason for administration of the prescribed drug
- Question the patient regarding the type and intensity of symptoms (e.g., pain, discomfort, diarrhea, or constipation) to provide a baseline for evaluation of the effectiveness of drug therapy. (Ford 439)
- Assess for relief of symptoms
- Monitor vitals
- Report abdominal distention, fever, or abdominal pain
- If diarrhea is chronic encourage increased fluid intake such as, weak tea, water, bullion, or drinks that have added electrolytes (pedialyte, gatorade)
- Monitor fluid intake & output

## Herbal Considerations

Chamomile has several uses in traditional herbal therapy, including as a mild sedative and for treatment of digestive upsets, menstrual cramps, and stomach ulcers. It has been used topically for skin irritation and inflammation. Chamomile is on the U.S. Food and Drug Administration (FDA) list of herbs generally recognized as safe. It is one of the most popular teas in Europe. When used as an infusion, it appears to produce an antispasmodic effect on the smooth muscle of the GI tract and to protect against the development of stomach ulcers. Although the herb is generally safe and nontoxic, the infusion is prepared from the pollen-filled flower heads and has resulted in mild symptoms of contact dermatitis to severe anaphylactic reactions in individuals hypersensitive to ragweed, asters, and chrysanthemums (DerMarderosian, 2003). (Ford 436)

Generic	Trade	Use	Dose
<b>Balsalazide</b>	Colazal	Treats active ulcerative colitis	2250 mg orally TID for 8 wk
<b>Mesalamine</b>	Asacol, Pentasa,	Treats active ulcerative colitis, proctosigmoiditis, proctitis	800–1000 mg orally TID or QID Suspension enema: 4 g daily
<b>Olsalazine</b>	Dipentum	Maintenance and remission of ulcerative colitis	1 g/day orally in two divided doses
<b>Sulfasalazine</b>	Azulfidine	Ulcerative colitis, rheumatoid arthritis	Initial: 3–4 g/day orally in divided doses Maintenance: 2 g orally QID

# Anabolic Steroids

## How do they work? "Action"

Anabolic steroids are synthetic drugs chemically related to the androgens. Like the androgens, they promote tissue-building processes. Given in normal doses, they have a minimal effect on the accessory sex organs and secondary sex characteristics. (Ford 491)

## Indications

Anabolic steroid use includes the following:

- Management of anemia of renal insufficiency
- Control of metastatic breast cancer in women
- Promotion of weight gain in those with weight loss after surgery, trauma, or infections (Ford 491-492)

## It's not always about them gains!

The use of anabolic steroids to promote an increase in muscle mass and strength has become a serious problem. Anabolic steroids are not intended for this use. Unfortunately, deaths in young, healthy individuals have been directly attributed to the use of these drugs. Young men and women should be discouraged from the illegal use of anabolic steroids to increase muscle mass. (Ford 492)

## Contraindications

- Known hypersensitivity
- Liver disorders
- Serious cardiac disease
- Prostate gland disorders
- Pregnancy category x do not give to pregnant or lactating women

## Adverse Reactions

- Virilization in women
- Acne
- Nausea, vomiting, diarrhea, fluid and electrolyte imbalances
- testicular atrophy, jaundice, anorexia, and muscle cramps may also be seen.
- Blood-filled cysts of the liver and sometimes the spleen, malignant and benign liver tumors, an increased risk of atherosclerosis, and mental changes

## Nursing management

- Assess and document the patient's physical and nutritional status before starting therapy
- Baseline laboratory studies may include a complete blood count, hepatic function tests, and serum electrolytes and serum lipid levels. Review these studies and note any abnormalities.
- Sodium and water retention may also occur with androgen or anabolic steroid administration, causing the patient to become edematous. In addition, other electrolyte imbalances, such as hypercalcemia, may occur. Monitor the patient for fluid and electrolyte disturbances.
- Anabolic steroids may cause nausea and GI upset. Take this drug with food or meals.
- Keep all primary health care provider or clinic visits, because close monitoring of therapy is essential.
- Female patients: Notify the primary health care provider if signs of virilization occur.

## Interactions:

- **Oral anticoagulants:** Increased antidiuretic effect
- **Imipramine and androgen:** Increased risk of paranoid behavior
- **Sulfonylureas and anabolic steroids:** Risk of hypoglycemia

Generic	Trade	Use	Route
<b>Nandrolone</b>	n/a	Anemia of renal insufficiency, human immunodeficiency virus (HIV) wasting syndrome	50–200 mg/wk IM
<b>Oxymetholone</b>	Anadrol -50	Anemia	1–5 mg/kg/day orally
<b>Oxandrolone</b>	Oxandrin	Bone pain, weight gain, protein catabolism	2.5–20 mg/day orally in divided doses

# CNS Stimulants

## - Analeptics

### How do they work? "Action"

Drugs that stimulate the respiratory center of the brain and cardiovascular system, used with narcolepsy and as an adjuvant treatment for obstructive sleep apnea

### Facts

Stimulants enhance dopamine transmission to areas of the brain that interpret well-being. To maintain pleasurable feelings, people continue the use of stimulants, which leads to their abuse and the potential for addiction. (Ford 190)

### Indications

- Narcolepsy
- Obstructive sleep apnea

### Adverse Reactions

- Excessive CNS stimulation, headache, dizziness
- Apprehension, disorientation, hyperactivity
- Nausea, vomiting, cough, dyspnea
- Urinary retention, tachycardia, palpitations

### Contraindications

- Known hypersensitivity
- Convulsive disorders
- Ventilation disorders ( COPD)
- Cardiac problems
- Hypertension
- Hyperthyroidism
- Glaucoma
- Pregnancy

### Interactions

- **Anesthetics:** Increased risk of cardiac arrhythmias
- **Theophylline:** Increased risk of hyperactive behaviors
- **Oral contraceptives:** Decreased effectiveness of oral contraceptive when taken with modafinil

### Nursing management

- An increased risk of suicidal ideation in children and adolescents has been found when using the drug atomoxetine (Strattera). Patients with ADHD started on atomoxetine should be monitored carefully for suicidal thoughts or behaviors.
- Stimulants enhance dopamine transmission to areas of the brain that interpret well-being. To maintain pleasurable feelings, people continue the use of stimulants, which leads to their abuse and the potential for addiction.
- Older adults are especially sensitive to the effects of the CNS stimulants and may exhibit excessive anxiety, nervousness, insomnia, and mental confusion. Cardiovascular disorders, common in the older adult, may be worsened by the CNS stimulants. Careful monitoring is important because these reactions may result in the need to discontinue use of the drug.
- **ADHD:** Give the drug in the morning 30 to 45 minutes before breakfast and before lunch. Do not give the drug in the late afternoon.
- **Narcolepsy:** Keep a record of the number of times per day that periods of sleepiness occur, and bring this record to each visit to the primary health care provider or clinic.
- **Amphetamines and anorexiant:** These drugs are taken early in the day to avoid insomnia. Do not increase the dose or take the drug more frequently, except on the advice of the primary health care provider.
- **Caffeine (oral, nonprescription):** Over-the-counter caffeine preparations should be avoided if the individual has a history of heart disease, high blood pressure, or stomach ulcers.

Generic	Trade	Use	Dose
<b>Armodafinil</b>	Nuvigil	Narcolepsy, obstructive sleep apnea, sleepiness due to shift work	150–250 mg/day orally in a single morning dose
<b>Doxapram</b>	Dopram	Respiratory depression: postanesthesia, drug-induced, acute respiratory insufficiency superimposed on COPD	0.5–1 mg/kg IV
<b>Modafinil</b>	Provigil	Narcolepsy, obstructive sleep apnea	200–400 mg/day orally

# Androgens

## How do they work? "Action"

Testosterone and its derivatives are male hormones that cause the reproductive maturation in the adolescent male. From puberty onward, androgens continue to aid in the development and maintenance of secondary sex characteristics: facial hair, deep voice, body hair, body fat distribution, and muscle development. Testosterone also stimulates the growth in size of the sex organs (penis, testes, vas deferens, prostate) at the time of puberty. The androgens also promote tissue-building processes (anabolism) and reverse tissue-depleting processes (catabolism). (Ford 491)

## Indications

**Androgen therapy may be given as replacement to treat:**

- Testosterone deficiency
- Hypogonadism (failure of the testes to develop)
- Delayed puberty
- Development of testosterone deficiency after puberty Androgens may given to females to treat
- Postmenopausal, metastatic breast carcinoma
- Premenopausal, hormone-dependent metastatic breast carcinoma

**Transdermal testosterone system**

- replacement therapy when endogenous (produced by the body) testosterone is deficient or absent.

**Anabolic steroid use is indicated for**

- Management of anemia of renal insufficiency
- Control of metastatic breast cancer in women
- Promotion of weight gain in those with weight loss after surgery, trauma, or infections (Ford 491-492)

## Contraindications

- Known hypersensitivity
- Liver disorders
- Serious cardiac disease
- Prostate gland disorders
- Pregnancy category x do not give to pregnant or lactating women

## Interactions:

- **Oral anticoagulants:** Increased antidiuretic effect
- **Imipramine and androgen:** Increased risk of paranoid behavior
- **Sulfonylureas and anabolic steroids:** Risk of hypo glycemia

## Adverse Reactions

### Electrolyte imbalances

- Hypernatremia
- Hypercalcemia

### In males:

- Breast enlargement " gynecomastia"
- Testicular atrophy
- May inhibit testicular function
- Impotence
- Penile enlargement
- vomiting, jaundice, headache, anxiety,
- male-pattern baldness, acne, and depression.
- Fluid and electrolyte imbalances, which include sodium, water, chloride, potassium, calcium, and phosphate retention.

### In females:

- Amenorrhea
- Virilization " male characteristics"
- Menstrual irregularities
- Male pattern baldness
- Acne

## Nursing management

- Monitor vitals every 4 or 8 hrs
- Monitor weight for patients with advanced breast carcinoma. Contact the HCP if the patient gains or loses 5 pounds
- Monitor for edema
- Monitor for fluid and electrolyte imbalance
- Older adults with cardiac problems or kidney disease are at increased risk for sodium and water retention when taking androgens or anabolic steroids. (Ford 493)
- Anabolic steroids may cause nausea and GI upset. Take this drug with food or meals.
- Keep all primary health care provider or clinic visits, because close monitoring of therapy is essential.
- Female patients: Notify the primary health care provider if signs of virilization occur. (Ford 494)
- When the androgens are administered to a patient with diabetes, blood glucose levels should be measured frequently because glucose tolerance may be altered. Adjustments may need to be made in insulin dosage, oral antidiabetic drugs, or diet. (Ford 493)

Generic	Trade	Use	Route
Fluoxymesterone	n/a	<b>Males:</b> Hypogonadism, delayed puberty <b>Females:</b> Inoperable advanced breast cancer	<b>Males:</b> 5–20 mg/day orally <b>Females:</b> 10–40 mg/day orally
Methyltestosterone	Testosterone	<b>Males:</b> Hypogonadism, delayed puberty <b>Females:</b> Inoperable advanced breast cancer	<b>Males:</b> 10–50 mg/day orally <b>Females:</b> 50–200 mg/day orally
testosterone	Androgel, androderm, depo-testosterone	Primary or hypogonadotropic hypogonadism, delayed puberty	<b>Buccal:</b> 30 mg BID <b>Gel:</b> apply daily <b>Injectable:</b> 50–400 mg every 2–4 wk <b>Transdermal:</b> 6 mg/day, apply patch daily <b>Spray:</b> 30–120 mg daily

## SIGNS & SYMPTOMS

**PAIN**-Jaw, back, mid back/shoulder pain, heartburn (epigastric), Substernal  
Key words = priority: "Sudden" "Crushing" "radiating" **NCLEX TIP**  
**SOB** "dyspnea" "labored breathing"  
**NAUSEA** Vomiting "Abdominal pain"  
**SWEATING** "Diaphoresis"  
**PALE COOL SKIN** "dusky"  
**ANXIETY**

## CAUSES

### SODDA

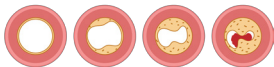
**S**-Stress, Smoking, Stimulants (caffeine, amphetamines)  
**O**-Obesity-(BMI over 25)  
**D**-Diabetes & HTN (over 140/90)  
**D**-Diet (high cholesterol) animal fats  
**A**-African American males & Age (over 50)  
\*Men more than women

## PROGRESSION

### CAM

"Ischemic heart disease"

**C**-CAD "coronary artery disease"  
**A**-ACS "acute coronary syndrome"  
Angina - **Stable** "Safer"- relieved w/rest  
Angina - **Unstable** "Unsafe" - Unrelieved  
**M**-MI (heart die)



## PATIENT EDUCATION

### DRESS

**D**-Diet low (sodium & fluids (2g/2L per day)  
Prevent **HF** Heart Failure=Heavy Fluid  
**Report** "New, Rapid" Weight Gain-Water Gain!  
**R**-Reduce Stress, Alcohol, Caffeine, Cholesterol (animal fats)  
**E**-Exercise (30 min x 5 days/wk)  
**S**-Smoking Cessation  
**S**-Sex (2 flights of stairs with NO SOB)

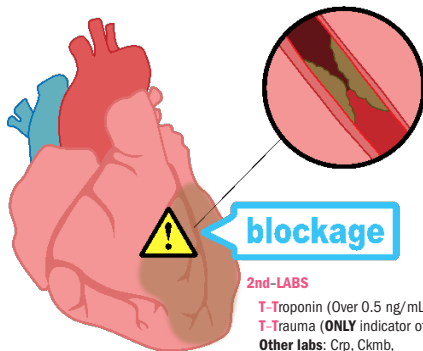
**NCLEX TIP**

\***AVOID** NSAIDS (naproxen, ibuprofen) - increases CLOT risk!

# MYOCARDIAL INFARCTION

## PATHO

**MI**=Heart muscles **DIE** "necrosis" (minutes = muscle death)  
Blockage of Coronary Artery "O2 Tube"



### 2nd-LABS

**T**-Troponin (Over 0.5 ng/mL)  
**T**-Trauma (**ONLY** indicator of MI)  
**Other labs**: Crp, Ckmb,  
Myoglobin, CRP (inflammation)

## DIAGNOSTICS

### 1st-EKG

(Any chest pain or MI symptoms)



NORMAL



ST ELEVATION



ST DEPRESSION

## TREATMENT: PHARMACOLOGY

### AC-Anti Clogging of Arteries

**A**-Antiplatelet HOLD if: Platelets 50K or LESS  
"below 50 gets risky" (not INR, not aPTT)  
**A**-ASA  
**C**-Clopidogrel  
**C**-Cholesterol Lowering "-Statin"  
Lovastatin "stay clean"

### CAUTION:

**NO** grapefruit  
Liver Toxic-report "clay colored stools"  
Muscle pain (Rhabdomyolysis risk)  
Late night-take at dinner

## CHOLESTEROL PANEL

**C**-CLOGGED ARTERIES (risk)  
**200 or Less**-Total Cholesterol  
**150 or Less**-Triglycerides  
**100 or Less**-LDL  
**40 or More** = HDL

## TREATMENT: PHARMACOLOGY

24

### DURING-Any Chest Pain

**O**-Oxygen  
**A**-Asa  
**N**-Nitro-under tongue x 3 Max  
**M**-Morphine - Any pain after = MI (injury)

### AFTER-MI

#### Clot Stabilization:

Heparin: prevents CLOT growth (**NOT dissolve** only t-PA)  
PTT: 46 - 70 "**3 x MAX**" Antidote: Protamine Sulfate  
**Memory Trick: "HaPTT" frog**

#### Heart Rest:

**B**-Beta Blockers (-lol) Atenolol  
**Blocks** both BP & HR (Lol = Low BP & HR)

#### CAUTION:

**B**-Bad for Heart Failure patients (CHF)  
**B**-Bradycardia (60 or Less) & BP low (HR LESS than 60)  
**B**-Breathing Problems "wheezing" (Asthma, COPD)  
**B**-Blood sugar masking "hides s/s" (Diabetics)

#### C-Calcium Channel Blockers

Calms BP & HR-(**AVOID** Low Hr & BP)  
(Nifedipine, Diltiazem, Verapamil)  
-dipine "declined BP & HR"  
-zem "zen yoga for heart"  
-amil "chill heart"

#### D-Dilators (vasodilators = O<sub>2</sub> to heart)

**Nitroprusside** (only for HTN crisis) & Isosorbide  
**Nitro** "Pillow for heart"

**NO** viagra "-afil" Sildenafil = **DEATH!**

Nitro drip: **STOP** if Systolic BP below 90 or 30 mmHg Drop  
SE: HA is Common + SLOW Positions changes "syncope"

## DISCHARGE-GOING HOME

### Heart Rest:

1st choice **A**-Ace (-pril) Lisinopril "chill pril"  
2nd choice **A**-ARBs (-sartan) Losartan "relax man"  
Antihypertensive (BP ONLY) \***HOLD**: Low BP (not HR)

### Precautions:

**A**-Avoid Pregnancy  
**A**-Angioedema "thick tongue"  
(Airway Risk) \*only Ace \***NCLEX TIP**  
**C**-Cough \*only Ace  
Creatinine (Kidney) (normal: 0.9 -1.2) \*only Ace  
**E**-Elevated K+ (normal 3.5-5.0) \***NCLEX TIP**  
**AVOID** Salt Substitutes + Green Leafy veggies  
• 1st-Cardiac Monitor  
• High Potassium = High Pump  
• Monitor: muscle cramps, spasms,  
peaked T waves, ST changes ©Stefanie Benton

**C-Contrast** = Kills Kidneys "Angioplasty, Angiogram, CABG"

**A-Allergy** to Iodine (warm flushing normal)

**B-Bleeding**-direct manual pressure (above site)

**NO**=heparin, warfarin, ASA, clopidogrel

**C-Creatinine** "Kidney" (normal: 0.9 - 1.2)

**REPORT:** Creatinine Over 1.3 & Urine **below 30 ml/hr**

**STOP** Metformin 48 hrs (before/after)

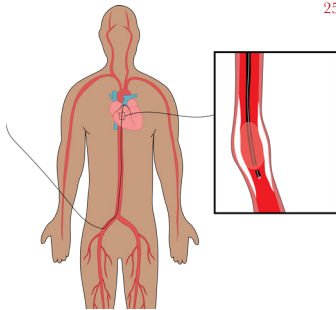
**C-Can't feel pulses** (Pulses = Perfusion O2)

Diminished pulses (4-12 hrs post-procedure) **MAX**

**PRIORITY:**

Non palpable pedal pulse **AFTER** = **CALL HCP (Dr.)**

**Key words:** "cool leg, pulse non palpable, present only with doppler US."



## COMPLICATIONS AFTER MI

**ACUTE:** (weeks after)

Cardiogenic Shock (severe hypotension)

V fib/V tach (no pulse) = **DEADLY**

Defibrillate=Don't have a pulse

Cardioversion=Count a pulse \*synchronize\*

**CHRONIC:** (lifetime)

Heart failure "Heavy Fluid"

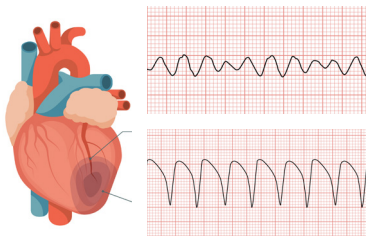
**Rapid** weight gain (Water Gain),

**Worsening** crackles (fluid in Lungs "pulmonary, edema")

**Sudden** edema (JVD, peripheral edema "+1 pitting")

**#1 Priority**-IV Diuretics-Furosemide, Bumetanide "dried"

(**NOT** isosorbide)



# NitroGlycerin

**O<sub>2</sub> to Heart**

**NO** viagra "-afil" Sildenafil = **DEATH!**

**NORMAL ADVERSE EFFECT:**

HA=Normal Side Effect

Hypotension=Adverse effect

(need slow position changes)

## PILL (or spray)

**S**-Stable Angina

**S**-Safe Angina

**S**-Stops when activity **STOPS** (Stress Induced)

\*Take Before strenuous activity

**GOAL:**

**NO chest pain**=Daily activities

"comb hair, fix hair, get dressed, make up, making bed etc."

**TAKING MED:**

CALL 911: PAIN 5 min. After 1st dose.

3 doses max x 5 min apart

**NO SWALLOW**-SL under

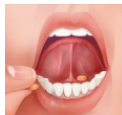
**STORAGE:**

**NO LIGHT-NO HEAT**

**NOT:** pill box, car, plastic bag, pocket

**YES:** purse ok

\*Replace every **6 months**



## Nitro Patch (Transdermal nitro patch)

**U**-Unstable Angina

**U**-Unsafe Angina

**U**-Unrelieved with rest /Unpredictable (anytime)

1 x daily **NOT PRN**

1 patch at a time **NOT 2 patches**

**YES** Shower is ok

**LOCATION:** Rotate locations **Daily**

"**Clean, Dry, shaven area**" teach patient to wash hands

after application

Upper Body (subclavian, arm, upper chest)

**NOT:** hairy, scarred, burned, callous

**NOT BROKEN SKIN**

\***TEST TIP:** Patch fall off? (Over 1 hour ago)

Take nitro (pill/spray) New patch can take 40-60 min.

\*Nurses wear gloves! Will cause **MAJOR HA** if it comes into contact with skin!



## ANTICOAGULANTS (clot prevention)

Anti**platelets** (**LESS** potent)

ASA & Clopidogrel

Platelets **LESS** than **50k** = **RISKY** (Normal: 150-400k)

**NOT** INR or PTT

Anti**coagulants** (**MOST** potent)

**Warfarin** = INR "warINR"

Range: 2.5-3.5 (**3 x MAX range**)

Antidote: Vitamin K (green leafy veggies) \***NOT** K+ = potassium\*

**Heparin** (Enoxaparin) = aPTT "HaPTT" frog Partial Thromboplastin Time

Range: 46-70 (**3 x MAX range**)

Antidote: Protamine Sulfate

## BLEED RISK(Patient Education)



**NO** peptic ulcers (or active bleeds)

**NO** Rugs/dim halls (Well lit halls)

**NO** razors, hard brushing, constipation

**NO** NSAIDS like naproxen/ ibuprofen

**NO** EGGO vitamins

**E-E** Echinacea, A vitamin

**G-Gingko**, Garlic, Ginseng

**O-O** mega 3

# MYOCARDIAL INFARCTION

## TREATMENT

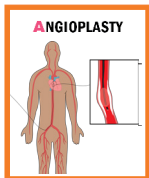
(+) Positive Troponin = Heart Attack (MI)

**PRIORITY: REMOVE THE CLOT!**

### "CATH LAB" OR SURGERY

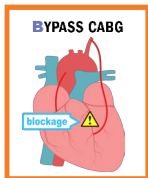
"PCI" -graphy, -plasty

**A**



**ANGIOPLASTY**

**B**



**BYPASS CABG**

### BEFORE

NPO 6 - 12 hrs

### AFTER

**NO** heavy lifting- lie flat  
**NO** Baths-Shower ok (dont soak)  
 Infected Incision  
 "red, warm, drainage"

### CLOT BUSTER "Thrombolytics, Fibrinolytics"

**t-PA:** Alteplase, Streptokinase (Allergy risk)  
 Dissolves Clot **ONLY** (heparin does NOT)

### BLEED RISK

8 hour duration

**NO** injections (IV, SQ, IM, ABG)

**NOT** via central lines (CVC)

**ONLY** "compressible site" (IV, PICC)

**NOT FOR:**

**Active Bleeds:**

Peptic Ulcers (but menstruation is safe)

**History:**

Arteriovenous malformations

Intracranial "Cerebral" hemorrhage

Hypoglycemia (relative contraindication)

Hypertension (over 180/110) **TEST TIP**

## STRESS TEST

Non MI (Non priority) · Spot the Narrowing

### TREADMILL STRESS TEST

**STOP** test:

chest pain  
 ST elevation

### CHEMICAL: NUCLEAR PHARMACOLOGICAL STRESS TEST

**24-48 hours BEFORE**

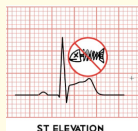
**NO** Cigarettes, Caffeine (tea, soda, coffee) **\*NO DECAF**

**NO** Meds: Nitro, Beta Blocker, Theophylline (stimulant)

NPO (nothing oral) **4 hrs** before/after



NORMAL



ST ELEVATION



## NOTES

# CNS Stimulants

## - Anorexiant

### How do they work? "Action"

Anorexiant are drugs pharmacologically similar to the amphetamines. Their ability to suppress the appetite is thought to be due to their action on the appetite center in the hypothalamus. (Ford 190)

### Indications

Treatment of obesity via appetite suppression

### Adverse Reactions

- Excessive CNS stimulation, headache, dizziness
- Apprehension, disorientation, hyperactivity
- Nausea, vomiting, cough, dyspnea
- Urinary retention, tachycardia, palpitations

### Education

- These drugs are intended for patients with chronic weight management issues when used with an approved diet and physical activity program.
- These drugs should only be used for obesity (body mass index [BMI] of 30 or greater) or overweight (BMI of 27) when comorbid conditions exist, such as hypertension, type 2 diabetes, or dyslipidemia.
- Never take over-the-counter weight loss preparations with these drugs.
- If you have not achieved 5% weight loss in 12 weeks, contact your primary health care provider; never increase the dose to speed up or increase weight loss.
- Call your primary health care provider immediately if you experience mental changes (agitation or hallucinations), rapid heartbeat, dizziness, lack of coordination, or feelings of warmth. This may be a condition called neuroleptic malignant syndrome, which needs emergent treatment.
- Be aware of possible impairment in the ability to drive or perform hazardous tasks.
- Avoid other stimulants, including those containing caffeine such as coffee, tea, and cola drinks
- Read labels of foods and nonprescription drugs for possible stimulant content.
- Women: Use pregnancy protection and do not breastfeed when using these drugs.
- Men: Seek immediate medical treatment if you have an erection lasting more than 4 hours. (Ford 192)

### Contraindications

- Known hypersensitivity
- Convulsive disorders
- Ventilation disorders ( COPD)
- Cardiac problems
- Hypertension
- Hyperthyroidism
- Glaucoma
- Pregnancy

### Interactions

- **Anesthetics:** Increased risk of cardiac arrhythmias
- **Theophylline:** Increased risk of hyperactive behaviors
- **Oral contraceptives:** Decreased effectiveness of oral contraceptive when taken with modafinil

### Nursing management

- An increased risk of suicidal ideation in children and adolescents has been found when using the drug atomoxetine (Strattera). Patients with ADHD started on atomoxetine should be monitored carefully for suicidal thoughts or behaviors.
- Stimulants enhance dopamine transmission to areas of the brain that interpret well-being. To maintain pleasurable feelings, people continue the use of stimulants, which leads to their abuse and the potential for addiction.
- Older adults are especially sensitive to the effects of the CNS stimulants and may exhibit excessive anxiety, nervousness, insomnia, and mental confusion. Cardiovascular disorders, common in the older adult, may be worsened by the CNS stimulants. Careful monitoring is important because these reactions may result in the need to discontinue use of the drug.
- **ADHD:** Give the drug in the morning 30 to 45 minutes before breakfast and before lunch. Do not give the drug in the late afternoon.
- **Narcolepsy:** Keep a record of the number of times per day that periods of sleepiness occur, and bring this record to each visit to the primary health care provider or clinic.
- **Amphetamines and anorexiant:** These drugs are taken early in the day to avoid insomnia. Do not increase the dose or take the drug more frequently, except on the advice of the primary health care provider.
- **Caffeine (oral, nonprescription):** Over-the-counter caffeine preparations should be avoided if the individual has a history of heart disease, high blood pressure, or stomach ulcers.

#### Generic

#### Trade

#### Use

#### Dose

**Benzphetamine**

Didrex

Obesity

25–50 mg orally 1–3 times/day

**Phendimetrazine**

Bontril

Obesity

35 mg orally 2–3 times/day

# Anthelmintic

## How do they work? "Action"

- **Albendazole (Albenza)** interferes with the synthesis of the parasite's microtubules, resulting in death of susceptible larvae. This drug is used to treat larval forms of pork tapeworm and to treat liver, lung, and peritoneum disease caused by the dog tapeworm.
- **Mebendazole** blocks the uptake of glucose by the helminth, resulting in depletion of the helminth's own glycogen. This drug is used to treat whipworm, pinworm, roundworm, American hookworm, and the common hookworm.
- **The activity of pyrantel (Antiminth)** is probably due to its ability to paralyze the helminth (Ford 129)

## Indications

Roundworms, pinworms, whipworms, hookworms, and tapeworms are examples of helminths. These drugs are used to eradicate helminths out of the body.

## Adverse reactions

- Drowsiness, dizziness
- Nausea, vomiting
- Abdominal pain and cramps, diarrhea (Ford 129)

## Contraindications & Caution

- The anthelmintic drugs are contraindicated in patients with known hypersensitivity to the drugs and during pregnancy (pregnancy category C).
- They should be used cautiously in lactating patients, patients with hepatic or renal impairment, and patients with malnutrition or anemia.

## Nursing management

- Follow the dosage schedule exactly as printed on the prescription container. It is absolutely necessary to follow the directions for taking the drug to eradicate the parasite.
- Follow-up stool specimens will be necessary because this is the only way to determine the success of drug therapy.
- When an infection is diagnosed, multiple members of the family may be infected, and all household members may need to be treated. Playmates of the infected child may also need to be treated.
- It is important to wash all bedding and bed clothes once treatment has started.
- Daily bathing (showering is best) is recommended. Disinfect toilet facilities daily, and disinfect the bathtub or shower stall immediately after bathing. Use the disinfectant recommended by the primary health care provider or use chlorine bleach. Scrub the surfaces thoroughly and allow the disinfectant to remain in contact with the surfaces for several minutes.
- During treatment for a ringworm infection, keep towels and facecloths for bathing separate from those of other family members to avoid the spread of the infection. It is important to keep the affected area clean and dry.
- Wash the hands thoroughly after urinating or defecating and before preparing and eating food. Clean under the fingernails daily and avoid putting fingers in the mouth or biting the nails.
- Food handlers should not resume work until a full course of treatment is completed and stools do not contain the parasite.
- Child care workers should be especially careful of diaper disposal and proper hand washing to prevent the spread of infections.
- Report any symptoms of infection (low-grade fever or sore throat) or thrombocytopenia (easy bruising or bleeding).
- Albendazole can cause serious harm to a developing fetus. Inform women of childbearing age of this. Explain that a barrier contraceptive is recommended during the course of therapy and for 1 month after discontinuing the therapy. (Ford 132-133)

## Interactions

### Albendazole (Albenza)

- **Dexamethasone:** Increased effectiveness of albendazole
- **Cimetidine:** Increased effectiveness of albendazole (Ford 129)

### Mebendazole

- **Hydantoins and carbamazepine:** Lower levels of mebendazole

Generic	Trade	Use	Dose
albendazole	Albenza	Parenchymal neurocysticercosis due to pork tapeworms, hydatid disease (caused by the larval form of the dog tapeworm)	Weight greater than or equal to 60 kg: 400 mg Weight less than 60 kg: 15 mg/kg/day
mebendazole	N/A	Treatment of whipworm, pinworm, roundworm, common and American hookworm	100 mg orally morning and evening for 3 consecutive days Pinworm: 100 mg orally as a single dose
pyrantel	Antiminth, Reese's Pinworm	Treatment of pinworm and roundworm	11 mg/kg orally as a single dose; maximum dose, 1000 mg

# Antiflatulents

## How do they work? "Action"

Work by reducing flatus in the GI tract via expulsion such as:

- Belching or passing gas.
- Simethicone also has a defoaming
- Agent that disperses and prevents
- The formation of gas pockets.

## Caution

- Pregnancy category C

## Interactions

- Decreases the effectiveness of other drugs

## Why are they used for? "Indications"

- Post op gas distention & air swallowing
- Dyspepsia
- Peptic ulcer
- Irritable bowel syndrome
- Diverticulosis
- Charcoal may be used to prevent pruritus associated with kidney dialysis treatment & as an antidote in poisoning

## Adverse Reactions

No adverse reactions have been reported.

## Contraindications

- Known hypersensitivity

## Nursing management

- Assess patient for abdominal pain, distention, and bowel sounds prior to and periodically throughout course of therapy. Frequency of belching and passage of flatus should also be assessed.
- PO: Administered after meals and at bedtime for best results. Shake liquid preparations well prior to administration. Chewable tablets should be chewed thoroughly before swallowing, for faster and more complete results.
- Drops can be mixed with 30 mL of cool water, infant formula, or other liquid as directed. Shake well before using.
- Explain to patient the importance of diet and exercise in the prevention of gas. Also explain that this medication does not prevent the formation of gas.
- Advise patient to notify health care professional if symptoms are persistent.

Generic	Trade	Use	Dose
Charcoal	Charcocaps, Flatulex	Intestinal gas, Diarrhea, poisoning antidote	520 mg orally after meals
Simethicone	Gas-x, mylicon, maalox, mylanta	Post op gas distention, dyspepsia, IBS, peptic ulcer	40-125 mg QID after meals and at bedtime

# Antidiarrheal

## How do they work? "Action"

Difenoxin (Motofen) and diphenoxylate (Lomotil) are chemically related to opioid drugs; therefore, they decrease intestinal peristalsis (Ford 436)

Loperamide (Imodium) acts directly on the muscle wall of the bowel to slow motility and is not related to the opioids. (Ford 437)

## Why are they used for? "Indications"

- **Loperamide:** Chronic diarrhea associated with irritable bowel syndrome
- **Difenoxin & diphenoxylate:** Diarrhea

## Contraindications

- Known hypersensitivity
- In patients whose diarrhea is associated with organisms that can harm the intestinal mucosa (*Escherichia coli*, *Salmonella* and *Shigella* spp.) (Ford 437)
- Pseudomembranous colitis
- Abdominal pain of unknown origin
- Obstructive jaundice
- Antidiarrheal drugs are contraindicated in children younger than 2 years of age.

## Caution

- Severe hepatic impairment
- Pregnancy category C drugs and should be used cautiously during pregnancy and lactation.
- Loperamide is a pregnancy category B drug but is not recommended for use during pregnancy and lactation.

## Adverse Reactions

- Anorexia, nausea, vomiting, and constipation
- Abdominal discomfort, pain, and distention
- Dizziness, drowsiness, and headache
- Sedation and euphoria

## Interactions

- **Antihistamines, opioids, sedatives, or hypnotics:** Increased risk of central nervous system (CNS) depression
- **Antihistamines and general antidepressants:** Increased cholinergic blocking adverse reactions
- **Monoamine oxidase inhibitor (MAOI):** Increased risk of hypertensive crisis

## Nursing management

- Review the patient's chart for the course of treatment and find the reason for administration of the prescribed drug
- Question the patient regarding the type and intensity of symptoms (e.g., pain, discomfort, diarrhea, or constipation) to provide a baseline for evaluation of the effectiveness of drug therapy. (Ford 439)
- Assess for relief of symptoms
- Monitor vitals
- Report abdominal distention, fever, or abdominal pain
- If diarrhea is chronic encourage increased fluid intake such as, weak tea, water, bullion, or drinks that have added electrolytes (Pedialyte, Gatorade)
- Monitor fluid intake & output

## Nclex Tip

If diarrhea persists for more than 2 days when over-the-counter (OTC) antidiarrheal drugs are being used, the patient should discontinue use and seek treatment from the primary health care provider. (Ford 437)

Generic	Trade	Use	Dose
<b>Bismuth</b>	Pepto bismol, bismatrol	<i>H. pylori</i> infection with duodenal ulcer, nausea, vomiting diarrhea, abdominal cramps	2 tablets or 30 mL orally every 30 min to 1 hr, up to 8 doses in 24 hr
<b>Difenoxin with atropine</b>	Motofen	Relieves symptoms of acute diarrhea	Initial dose: 2 tablets orally, then 1 tablet after each loose stool (not to exceed 8 tablets/day)
<b>Diphenoxylate with atropine</b>	Lomotil, lonox	Relieves symptoms of acute diarrhea	5 mg orally QID
<b>Loperamide</b>	Imodium, kapectate, maalox	Relieves symptoms of acute diarrhea	Initial dose 4 mg orally; then 2 mg after each loose stool (not to exceed 16 mg/day)
<b>Tincture of opium</b>	Paregoric	Severe diarrhea	0.6 mL orally QID

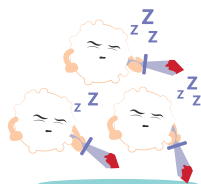
# Anti-inflammatory SULFasalazine

## INDICATION

- Inflammatory bowel disease (IBD)
- Crohn disease
- Ulcerative Colitis

## MOA:

Decreases colon inflammation by stopping prostaglandins (which cause inflammation)



## Kaplan

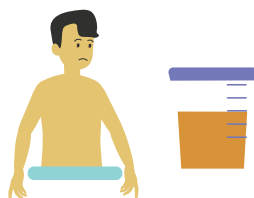
- Continue medication even after symptoms subside



## Side Effects:

### NORMAL

- Yellow-orange discoloration of the client's skin and urine
- No need for follow-up!  
**DO NOT** stop taking med



## HESI

- Contraindicated in patient with **SULFA** allergy.



## Major Adverse Effects:

**S**

**Sun Dried!**  
(sunblock & dry body!)

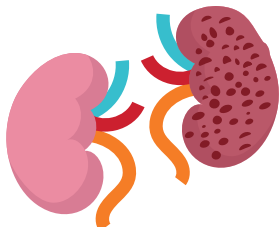


### Photosensitivity

- Wear sunblock
- Avoid "direct" sun exposure

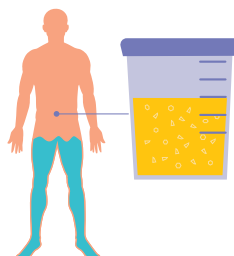
**U**

**Urine Crystals**  
(Kidney Stones)



**L**

**Low Urine Output**  
(SG HIGH = Dry)



### Dehydration

- Elevated urine Specific Gravity
- High & DRY!!! (norm: 1.003-1.030)

**F**

**Fluid & Folic Acid**



- **DRINK** 8 glasses of water daily
- **TAKE** Folic acid - 1mg/day

## Notes

# Anti Inflammatory Agents

## Drug names:

### S - Steroids

"-Sone"

Beclometha**sone**  
Flutica**sone**  
Methylpredniso**lone**

## Indication:

Swelling & inflammation

**S**

## Slow onset !

### NCLEX KEY WORD

**DO NOT USE** Fluticasone or Salmeterol for first sign of **acute asthma attack!**

**AIM** for Acute Attack

**A** - Al**buterol** 1<sup>st</sup>

**I** - Ipratropium 2<sup>nd</sup>

**M** - Methylpredniso**lone**  
(brand: Solu Medrol)

## Side Effects:

**S**

Sugar INCREASE



**S**

Sores in MOUTH (infection)



## KEY POINT

- Use Spacers to Prevent oral **THRUSH** (Candida)
- RINSE MOUTH AFTER EACH USE**
- DON'T SWALLOW** water !!



## Drug names:

### L - Leukotriene Inhibitor

"-Lukast"

- Montel**lukast**  
(Brand: singulair)
- Zafirl**lukast**

SINGULAIR  
Montelukast

ZAFIRLUKAST

## Memory Trick

### 3 L's

**L**uke likes to **SING** (airway open)

**LONG** term management

**L**ong Onset!  
(1-2 weeks to reach therapeutic range)



## NCLEX Key Points

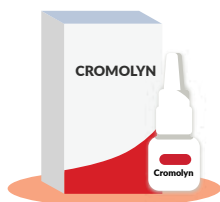
- NOT** during acute attacks
- NOT** a **RESCUE DRUG**
- This med will prevent inflammation that causes asthma attacks



## Drug name:

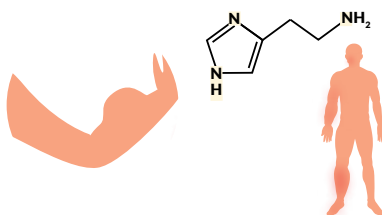
### M - Mast cell stabilizers

## Cromolyn



## Indication:

Blocks massive swelling



## Key Point

- PREVENTS** activity induced asthma
- Take **15 minutes before exertion** for maximum effects **HESI**
- Use **10-15 minutes before** physical activity **ATI**

## Notes

# Antineoplastics “Cell Cycle Nonspecific” - Alkylating Agents

## What do they do?

Alkylating agents make the cell a more alkaline environment, which in turn damages the cell. Malignant cells appear to be more susceptible to the effects of alkylating drugs than normal cells.

## Indications

- Treatment of cancer

## Adverse Reactions

- Bone marrow suppression (anemia, leukopenia, thrombocytopenia )
- Stomatitis
- Diarrhea
- and hair loss.
- The most common reactions are leukopenia and thrombocytopenia

## Nursing Alert

Radiation recall is a skin reaction in which an area that was previously irradiated becomes reddened when a patient is administered certain specific chemotherapy drugs. This is well differentiated from a reaction exclusive to the drugs, because of the defined outline of the previous radiation treatment field on the body.

## Contraindications

Antineoplastic drugs are contraindicated in patients with leukopenia, thrombocytopenia, anemia, serious infections, serious renal disease, or known hypersensitivity to the drug, and during pregnancy

## Interactions:

- **Phenytoin:** Increased risk of seizures
- **Aminoglycosides:** Increased risk of nephrotoxicity and ototoxicity
- **Loop diuretics:** Increased risk of ototoxicity

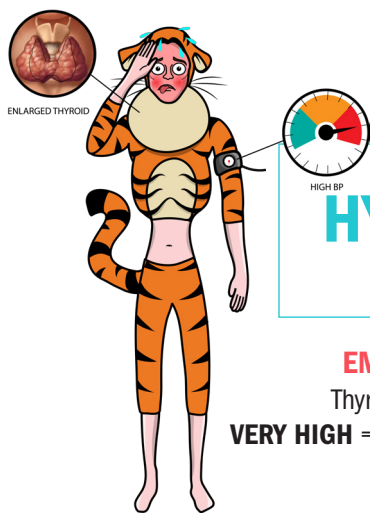
## Herbal Consideration

The shiitake mushroom, an edible variety of mushroom, is associated with general health maintenance but not with any severe adverse reactions. Mild side effects, such as skin rashes and GI upset, have been reported. Lentinan, a derivative of the shiitake mushroom, is proving to be valuable in boosting the body's immune system and may prolong the survival time of patients with cancer by supporting immunity. In Japan, lentinan is commonly used to treat cancer. Additional possible benefits of this herb include lowering cholesterol levels by increasing the rate at which cholesterol is excreted from the body. Under no circumstances should shiitake or lentinan be used for cancer or any serious illness without consulting a primary health care provider (DerMarderosian, 2003).

## Nursing management

- Wear personal protective equipment when preparing any of these drugs for parenteral administration.
- Administer any prophylactic medications or fluids in a timely manner to prevent reactions.
- Observe the patient closely before, during, and after the administration of an antineoplastic drug.
- Observe the IV site closely to detect any signs of extravasation (leakage into the surrounding tissues). Tissue necrosis can be a serious complication. Discontinue the infusion and notify the oncology health care provider if discomfort, redness along the pathway of the vein, or infiltration occurs.
- Continually update nursing assessments, nursing diagnoses, and nursing care plans to meet the changing needs of the patient.
- Notify the oncology health care provider of all changes in the patient's general condition, the appearance of adverse reactions, and changes in laboratory test results.
- Provide the patient and family with both physical and emotional support during treatment.
- Institute neutropenic precautions to prevent infections.
- Immediately report a temp higher than 100.4 or higher, cough, sore throat, chills, frequent urination, or a white blood cell count of less than 2500/mm<sup>3</sup>.
- Immediately before administering the first dose of an antineoplastic drug, take the patient's vital signs and obtain a current weight
- Get a baseline CBC before first dose
- Monitor ongoing blood results
- You may need to hydrate the patient before administration of cisplatin.
- You may need to administer antiemetics prior to administration.
- Educate the patient on side effects including weight loss and alopecia.
- Provide support and comfort.
- Teach the patient to report to you or to the health care provider immediately any of the following: bleeding gums, easy bruising, petechiae (pinpoint hemorrhages), increased menstrual bleeding, tarry stools, bloody urine, or coffee-ground emesis.

Generic	Side Effects	Route
Cyclophosphamide	<b>Immediate:</b> nausea, vomiting During therapy cycles: leukopenia, hemorrhagic cystitis, thrombocytopenia <b>Long term:</b> fertility problems, secondary cancers	<b>Leukemia/lymphomas:</b> ALL, AML, CLL, advanced lymphomas, Hodgkin's disease <b>Solid tumors:</b> breast, ovary, neuroblastoma, retinoblastoma <b>Nonmalignant:</b> mycosis fungoides, nephrotic syndrome (children), rheumatoid arthritis, systemic lupus erythematosus, multiple sclerosis
Chlorambucil	During therapy cycles: anemia, leukopenia, thrombocytopenia <b>Long term:</b> fertility problems	<b>Leukemia/lymphomas:</b> chronic lymphocytic leukemia (CLL), lymphomas, Hodgkin's disease



## HYPERthyroidism

Graves = GAINS "HIGH"

### EMERGENCY CONDITION:

Thyroid Storm "thyrotoxicosis"

VERY HIGH = "Agitation/Confusion" + HTN crisis!

## PATHO & CAUSES

**HIGH T3 & T4** Thyroid Hormones

Too much Iodine

Too much Thyroid Meds. (Levothyroxine)

Autoimmune: Graves = GAINS "HIGH"

**AUTOIMMUNE:** Graves = GAINS "HIGH"

## SIGNS & SYMPTOMS

**PRIORITY: EXTREME HIGH** = Thyroid Storm  
"Agitation & confusion" early sign

## HIGH & HOT!

### CLASSIC SIGNS-NCLEX KEY WORDS

**G GRAPE EYE** "Exophthalmos"  
(Use Eye patch/Tape Eyelids down) **NCLEX TIP**

**G GOLF BALLS** in throat "Goiter" **NCLEX TIP**

**HIGH BP**-HTN Crisis **180/100+**

(MI, CVA, Aneurysms)

**HIGH HR**-Tachycardia **100+** (normal **60-100**)

**HEART PALPITATIONS** + Atrial Fibrillation

**HIGH TEMP.** = **NOT DRY!**

HOT & Sweaty Skin "diaphoresis"

Heat Intolerance **NCLEX TIP**

**HIGH GI** "Diarrhea"

## LABS

**HIGH T3 & T4 HYPER**

Low-TSH

(look at T3 & T4 levels **FIRST**)

## DIET

**HIGH** METABOLISM

**HIGH** calories (4,000-5,000 per day) **NCLEX TIP**

**HIGH** protein & Carbs (meals & snacks)

**NOT** high fiber = **LOW FIBER!** (unless constipated)

**NO** caffeine (coffee, soda, Tea)

**NO** spicy food

## HYPOthyroidism

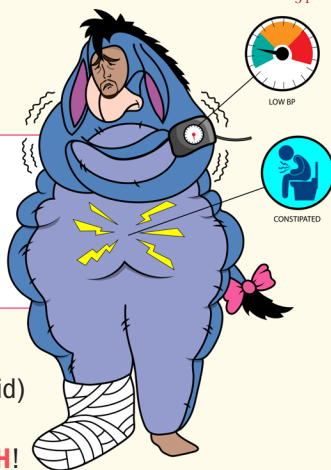
Hashimoto's | LOW & SLOW

### EMERGENCY CONDITION:

**Myxedema Coma** (Mini hypothyroid)

VERY Low/Slow:

Airway, Breathing, Low BP = **DEATH!**



## PATHO & CAUSES

**LOW T3 & T4** Thyroid hormones

Low Iodine, Antithyroid Treatments

Pituitary Tumor **NCLEX TIP**

**AUTOIMMUNE:** Hashimoto's | LOW & SLOW

## SIGNS & SYMPTOMS

**PRIORITY: EXTREME LOW** = Myxedema Coma  
Low RR-Respiratory FAILURE

**PRIORITY:** Place "Tracheostom Kit" by bedside **NCLEX TIP**

**KEY WORD:** "Endotracheal Intubation set up"

Low BP & HR "hypotension" "bradycardia" (below 60)

Low Temp. "cold intolerance" **NO** electric blankets

## LOW & SLOW = HYPO

### CLASSIC SIGNS

**LOW** energy "fatigue, weakness, muscle pains, aches"

**LOW** metabolism-Weight GAIN/Water Gain (Edema eyes)

**LOW** digestion "Constipation" **NOT** diarrhea

**LOW** HAIR LOSS "alopecia" **NOT** hirsutism **NCLEX TIP**

**LOW** mental-forgetful, ALOC (altered)

**LOW** mood-depression, "apathy, confusion"

**LOW** Libido-Low sex drive, infertile

**SLOW DRY** skin turgor **NCLEX TIP**

**LOW** & **SLOW**-menstruation "irregular" **NCLEX TIP**

**NO** period "missed"-Amenorrhea "AMEN no period!"

**SLOW** heavy period-Hypermeneorrhea (Hyper Menstruation)

## LABS

**LOW T3 & T4 hypO**

- HIGH TSH

"TSH always opposite of T3 & T4"

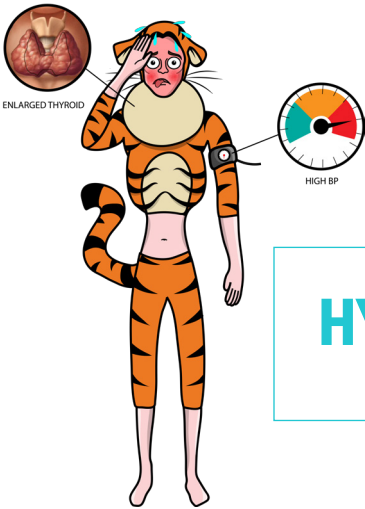
## DIET

**LOW** Metabolism

**LOW** Calories

**LOW** energy "Frequent rest periods" **NCLEX TIP**

NOTES



# HYPERthyroidism

Graves = GAINS "HIGH"

## PHARMACOLOGY

- SSKI** (Potassium Iodide)
  - S**–Shrinks the Thyroid
  - S**–Stains Teeth (use straw + juice)
  - K**–Keep 1 hour apart of other meds

### METHIMAZOLE

**NOT** baby safe



### PTU-Propylthiouracil

“Puts **T**hyroid **U**nderground” **MEMORY TRICK**

Baby safe

**REPORT:** Fever/Sore Throat

### BETA BLOCKERS “-lol” Propranolol

**L**–Low BP

**L**–Low HR

## TREATMENTS

### RAIU–Radioactive Iodine Uptake (Destroys the Thyroid)

**CAUTION**

#### BEFORE:



Pregnancy test before

**REMOVE** neck jewelry & dentures

**5–7 days before** Hold antithyroid Meds

**AWAKE–NO** anesthesia or Conscious Sedation

Diet: Before–NPO 2–4 hrs

After–NPO 1–2 hrs

#### AFTER: AVOID EVERYONE!

**NO** pregnant people

**NO** crowds

**NOT** same restroom (Flush 3 x)

**NOT** same food utensils

**NOT** same laundry as your family

### PATIENT EDUCATION

**E**–Exophthalmos” (grape eyes)

**E**ye **E**xercise “full range of motion” (**YES MOVE EYES**)

**E**ye Drops “artificial tears in conjunctiva” (NO dry eye)

**Dark** Sunglasses (avoid irritation) **NO** Massaging

**T**–Tape the eyelids closed or use Eye Patch **NCLEX TIP**

#### AVOID 5 S’s

Can Trigger **THYROID STORM!**

**NCLEX TIP**

**NO** Sodium (eye swelling) + HOB Up (drain the eyes)

**NO** Stimulants (Cluster care/ Dim Lights)

**NO** Smoking, Stress, Sepsis “sickness” (infection)

\*Don’t Touch Neck... release MORE T3 & T4\*

### THYROIDECTOMY SURGERY

Risk for **THYROID STORM!**

**NCLEX TIP**

**Priority: Stridor/Noisy breathing**

**NCLEX TIP**



**A**–Airway–**Endotracheal Tube** bedside **#1 Priority**

**Tracheostomy Set**

**B**–Breathing–Laryngeal **Stridor** “Noisy breathing”

**Keywords:** “Monitor Voice strength & Quality”

**C**–Circulation–bleeding around pillow & Incision site

Neutral head & neck alignment **NCLEX TIP**

- **NOT SUPINE!** HOB 30–45 degree

- **NO FLEXING** or Extending Neck

**NCLEX TIP**

**C**–Calcium **LOW below 8.6** (normal: **8.6–10.2**)

**Chvostek** (Cheek Twitch when touched)

**Trousseau** (“Twerk arm” with BP cuff x 3 min.)

**Tingling** around mouth/Muscle Twitching

**NCLEX TIP**

**MEMORY TRICK:** “Remove the **T** (thyroid) Check the **C** (calcium)”

# HYPOthyroidism

Hashi**m**Otos | **LOW & SLOW**



## PHARMACOLOGY

**L**–Levothyroxine (Lev**O** = HYP**O**)

“Leaves” T3 & T4 in the body **MEMORY TRICK**

**L**–Life Long + Long slow onset (3-4 weeks till relief)

**E**–Early morning /Empty stomach x 1 daily (**NOT** at night)

**V**–Very active (HIGH HR & BP) **Report** “agitation/confusion”

**O**–Oh the baby is fine! (pregnancy safe)

**NO FOOD**–take 1 hour **BEFORE** breakfast

**NO** Cure–med will **NOT** cure, only treat

**NO** Doubling doses (missed dose? Take it!)

**NEVER** “abruptly” **STOP** = Myxedema Coma

NOTES

# Antibiotics: 6 TEST TIPS OF ABX

## 1. Finish med

To prevent SUPER infection!

### Key Words

- Take until **all med is finished**
- DO NOT** stop when feeling better

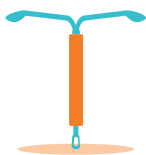


## 2. Accidental pregnancy

C - Child Care  
C - "-Cillins" - Penicillin, Amoxicillin  
C - "-Cycline" - Doxycycline, Tetracycline

### Key Words

- Oral contraceptives ineffective
- Use additional contraception like IUD.



## 3. NO alcohol

ABX are hard on liver



## 4. NO FOOD

MTF "Move The Food"

- M - Macrolides - Azithromycin
- T - Tetracycline - Doxycycline
- F - Fluoroquinolones - Levofloxacin

### Key Words

- Take on **EMPTY** stomach
- Full glass of water



## 5. NO sun

AVOID "Fun The Sun"

- F - Fluoroquinolones - Levofloxacin
- T - Tetracycline - Doxycycline
- S - Sulfa drugs = SUN burns

Trimethoprim - sulfa methoxazole  
(Brand: Bactrim)



## 5. NO sun

Others

- Sulfonylureas (Glyburide)
- Diuretics (thiazide/loops)

### Key Words

- Photosensitivity
- Avoid "direct sun exposure"
- Sun Burns (Wear Sun Block & Avoid Sun)



## 6. SUPER Toxic (Kidney + Ears)

Vancomycin  
Gentamicin  
Neomycin

### Key Words

PEAK & Trough

- Too HIGH = Kidneys DIE**
- Too Low = Infections Grows**

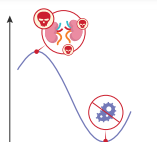


## 6. SUPER Toxic (Kidney + Ears)

### Key Words

REPORT: Signs of Toxicity

- Ear Damage "Ototoxicity"
  - Vertigo (loss of balance)
  - Tinnitus (ringing of the ears)
- Kidney Damage "Nephrotoxic"
  - REPORT IMMEDIATELY!!**
  - Creatinine **OVER 1.3** = Bad Kidney
  - BUN **Over 20**
  - Urine output **30ml/hr or LESS** = Kidney Distress



Don't let  
NCLEX TRICK YOU



Mycins



"- Thromycin" like Azi**THRO**mycin  
"-floxacin" like Cipro-flox-acin

# Neuromuscular Drugs

## - Cholinergic Blocking Drug

### How do they work? "Action"

Drugs with cholinergic blocking activity block ACh in the CNS, enhancing dopamine transmission.

### Indications

Adjunctive therapy in all forms of Parkinson-like symptoms and in the control of drug-induced extrapyramidal disorders

### Adverse Reactions

- Dry mouth
- Blurred vision
- Dizziness, mild nausea, and nervousness
- Skin rash, urticaria (hives)
- Urinary retention, dysuria
- Tachycardia, muscle weakness
- Disorientation and confusion

### Contraindications

- Glaucoma (angle-closure glaucoma)
- Pyloric or duodenal obstruction
- Peptic ulcers, prostatic hypertrophy, achalasia (failure of the muscles of the lower esophagus to relax, causing difficulty swallowing), myasthenia gravis, and megacolon.

### Interactions

- **Amantadine:** Increased anticholinergic effects
- **Digoxin:** Increased digoxin serum levels
- **Haloperidol:** Increased psychotic behavior
- **Phenothiazines:** Increased anticholinergic effects

### Drugs with Parkinson-like Adverse Reactions

The following drugs can produce symptoms similar to Parkinson's disease, also known as extrapyramidal symptoms (EPS), which may be treated with similar drugs to reduce the adverse reactions:

- Antidepressants
- Antiemetics
- Antipsychotics—first generation
- Lithium
- Stimulants
- Individuals older than 60 years frequently develop increased sensitivity to anticholinergic drugs and require careful monitoring. Confusion and disorientation may occur. Lower doses may be required.

### Nursing management

- If dizziness, drowsiness, or blurred vision occurs, avoid driving or performing other tasks that require alertness.
- Avoid the use of alcohol unless use has been approved by the primary health care provider.
- Relieve dry mouth by sucking on hard candy (unless the patient has diabetes) or taking frequent sips of water. Consult a dentist if dryness of the mouth interferes with wearing, inserting, or removing dentures or causes other dental problems.
- Keep all appointments with the primary health care provider or clinic personnel because close monitoring of therapy is necessary.
- Ask your primary health care provider before buying vitamin supplements when taking levodopa. Vitamin B6 (pyridoxine) may interfere with the action of levodopa.

Generic	Trade	Use	Dose
<b>Benztropine</b>	Cogentin	Parkinson's disease, drug-induced EPS	0.5–6 mg/day orally Acute dystonia: 1–2 mL IM or IV
<b>Diphenhydramine</b>	Benadryl	Drug-induced EPS, allergies	25–50 mg orally TID or QID

# Anticholinergics

## Benztropine, Atropine

### Drug names:

**Benz**tropine  
**A**tropine



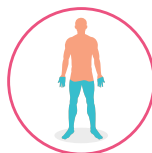
### Indication:

1. Speeds up heart rate in symptomatic bradycardia
2. Antidote for cholinergic crisis
3. Treats tremors in Parkinsons



### MOA:

Turns off the PNS - parasympathetic (rest & digest) by blocking the vagus nerve. This allows the SNS sympathetic fight or flight, to be ON IN FULL FORCE. Which activates the vital organs - SHOOTING UP the heart rate & making the body dry



### KEY POINTS

- Treat Extraparidal s/s (Dystonia)
- Parkinson's Tremors (Bradykinesia)
  - **Muscle rigidity**
  - **Shuffling gait**



### Memory Trick:

**TREMORS**  
**aTropines**

- Tropines

- Treat Tremors - Parkinsons

### KEY POINTS

#### CONTRAINDICATIONS

- **No Bowel obstruction**
- **No Glaucoma**

#### NCLEX

**Atropine may precipitate acute glaucoma**

Clients with glaucoma!- Notify HCP!

- **No BPH** or urinary retention!



### HESI Question

#### Patient Teaching

- **Teaching:** Notify the HCP if you develop **urinary retention**.
- This med can **reduce the ability to sweat** so do not overheat
- Sit or stand up slowly to prevent lightheadedness



### Notes

# NEUROMUSCULAR DRUGS: CHOLINERGIC BLOCKING

## DRUGS HOW DO THEY WORK? "ACTION"

Drugs with cholinergic blocking activity block ACh in the CNS, enhancing dopamine transmission.

## CONTRAINDICATIONS

- ❖ Glaucoma (angle-closure glaucoma)
- ❖ pyloric or duodenal obstruction
- ❖ peptic ulcers, prostatic hypertrophy, achalasia (failure of the muscles of the lower esophagus to relax, causing difficulty swallowing), myasthenia gravis, and megacolon.



## NURSING MANAGEMENT

- ❖ If dizziness, drowsiness, or blurred vision occurs, avoid driving or performing other tasks that require alertness.
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## INTERACTIONS

- ❖ **Amantadine:** Increased anticholinergic effects
- ❖ **Digoxin:** Increased digoxin serum levels
- ❖ **Haloperidol:** Increased psychotic behavior
- ❖ **Phenothiazines:** Increased anticholinergic effects

## ADVERSE REACTIONS

- ❖ Dry mouth
- ❖ Blurred vision
- ❖ Dizziness, mild nausea, and nervousness
- ❖ Skin rash, urticaria (hives)
- ❖ Urinary retention, dysuria
- ❖ Tachycardia, muscle weakness
- ❖ Disorientation and confusion

## DRUGS WITH PARKINSON-LIKE ADVERSE REACTIONS

The following drugs can produce symptoms similar to Parkinson's disease, also known as extrapyramidal symptoms (EPS), which may be treated with similar drugs to reduce the adverse reactions:

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diphenhydramine	Benadryl	Drug-induced EPS, allergies	25–50 mg orally TID or QID

# Anticholinergics & Methylxanthines

## Drug name:

**"-tropium"**

Ipratropium  
Tiotropium



## Indication:

Moderate to severe asthma & COPD, longer acting bronchodilator used 2nd during asthma attacks



## Memory Trick:

**AIM** for Acute Attack

**A** – Albuterol 1st

**I** – Ipratropium 2nd

**M** – Methylprednisolone  
(brand: Solu Medrol)



## MOA:

Blocks secretions, anticholinergic effects:  
can't see, pee, spit or sh\* - poop

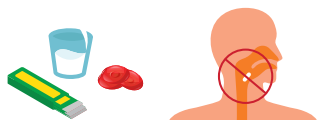
## Side Effects:

**Very dry body**

Treat the DRY mouth & throat  
for all anticholinergics

- Use gum/candy
- **Drink fluids**

**KEY POINT** - NO swallowing  
tiotropium capsules!



## HESI & ATI Question

**Contraindication to  
ALL anticholinergics:**

We Never give for  
patients who are  
already DRY.

No giving anticholinergics  
to:

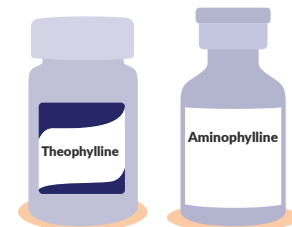
- Glaucoma
- Urinary retention (BPH)
- Bowel obstruction

## Drug name:

**M - Methylxanthines**

**"-phylline"**

- Theophylline
- Aminophylline



## KEY POINTS

**3 T's**

**NCLEX TIP**

- **T** – Toxic! **Over 20** (mcg/mL)  
"Frequent blood draws"
- **T** – Tonic Clonic Seizures  
Severe Toxicity **1st Priority**
- **T** – Tachycardia &  
Dysrhythmias **NCLEX TIP**



## Memory Trick:

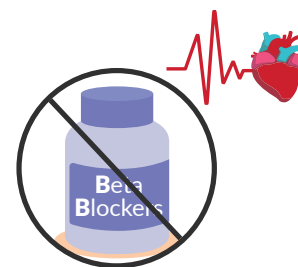
**"-phyllines"** make you  
feeling caffeinated & toxic



## HESI Question

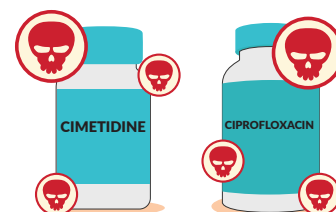
Teach pt to  
**AVOID beta blockers**  
that lower the heart rate  
while on  
**Theophylline**

**"ALERT HCP** of tachycardia  
**BEFORE** giving next dose"



## Key Teaching Points

- 2 drugs that **INCREASE**  
toxicity risk **NCLEX TIP**
- Cimetidine (H2 blocker)
- Ciprofloxacin (ABX)
- Take in AM
- **AVOID** Caffeine
- **STOP** before cardiac



## Notes

# Anticonvulsant Levetiracetam

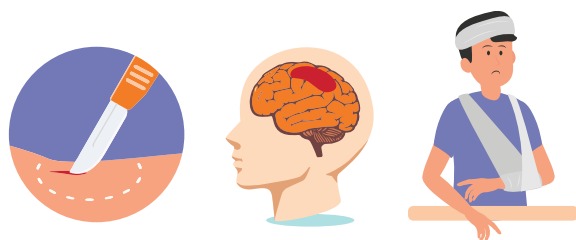
## Drug name:

**Levetiracetam**



## Indication:

- Prevent & treat seizures



- Often preferred **over phenytoin** due to minimal drug to drug interactions

## Over phenytoin



## Common Side Effects:

CNS depressant - LOW & SLOW body  
- drowsiness & fatigue



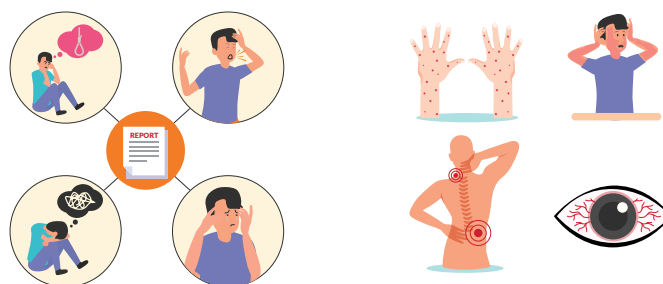
## MAJOR ADVERSE EFFECTS:

Just like Phenytoin -

- Suicidal thoughts
- Stevens-Johnson



- Report: New anxiety, agitation, depression, mood changes
- Report: Rash, blistering, muscle/joint pain



## KEY POINTS

### Patient teaching:

- **Driving** = Get permission from HCP & follow transportation dept. guidelines.

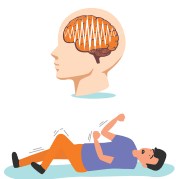


## Notes

# Anticonvulsant Phenytoin

## Indication:

Epilepsy (long term protection against seizures)



## Patient Teaching:

- **NO** oral contraceptives
- **NO** stopping abruptly
- Take Folic acid,



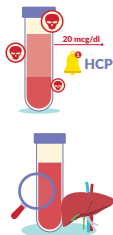
Phenytoin = pheny**TOXIC**



## KEY POINTS

**10-20** mcg/dl **Therapeutic Range**

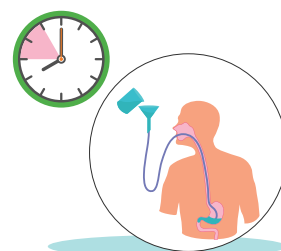
- **Below 10 - Seizure Risk**  
REPORT TO HCP!
- **OVER 20 - Toxic Risk**  
HOLD MED & notify HCP!
- **Routine Blood Tests**  
"blood levels monitored routinely"



## Administration:

- **STOP** Tube Feeding for 1-2 hours before and after admin.

**Mentioned multiple times - as a priority!!!**



## Toxicity: NCLEX TIPS

### EARLY Signs to Report to HCP

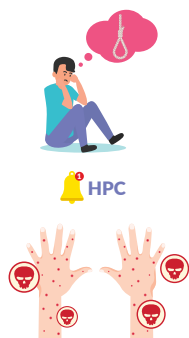
- **Ataxia** (\*unsteady gait or gait disturbance)
- Hand Tremor
- Slurred speech



## Other Adverse Effects:

### Key Word

- **Suicidal** Ideations
- Skin **Rash** - "new" "painful" = **PRIORITY!!!**



## HESI Question

- Hold med for level **higher than 20**
- Take at same time daily - **narrow therapeutic index**

## ATI Question

TEACH pt. to inform **dentist** that they are taking phenytoin

## HESI Question

- Perform or assist with oral care every shift.
- Skin rash, fatigue & dyspnea - **priority**

## KAPLAN Question

Statements requiring immediate intervention:

- "I noticed a **rash** on my stomach last week"
- "Lately I find myself thinking about **driving off a cliff**"



## KAPLAN Question

Encourage foods such as milk, cantaloupe and kale (foods high in folate & Vitamin D)

**Requires further teaching:** "If I start having adverse effects **I will stop taking** this med immediately"



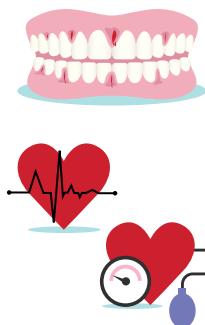
## Expected Side Effect

- Bradycardia & Hypotension
- Gingival hyperplasia

### NCLEX TIP

## TEACH:

Good dental hygiene with soft toothbrush



## Notes

# Antidepressants

## - 4 Rules

### 1. Increased risk of suicide

- Antidepressants can increase suicidal thoughts in first few weeks of Treatment
- NOTIFY provider of **any suicidal thoughts!**
- CLARIFY any **new** prescription  
MONITOR for:
  - **New** thoughts of suicide
  - **Unusual** behavior
  - **Worsening** depression

### 2. Slow Onset & SLOW taper off

**NEVER STOP** abruptly

### 3. NEVER Mix

- SSRI + St John's Wart or
- MAOI + Antidepressant (TCA, SSRI, SNRI)

### 4. ALL psych drugs

- Decrease BP** (slow position changes)
- Cause weight changes



**SSRI**

**SNRI**

**TCA**

**MAOI**

## TOP 3 MISSED Questions:

Which medication have the most potential risk for injury?

Select all that apply

Looking for sedating meds

1. Amitriptyline
2. Diphenhydramine
3. Colace
4. Alprazolam
5. Buspirone

Which combination of drugs should the nurse question?

Select all that apply

**SSRI**

Sertraline  
Escitalopram  
Citalopram

**MAOI**

Phenelzine  
Selegiline

- ☒ 1. Sertraline with Selegiline
- ☐ 2. Alprazolam with citalopram
- ☐ 3. Buspirone with Phenelzine
- ☒ 4. Lithium with Ketorolac
- ☐ 5. St John's Wort with Buspirone

Most potential for injury?

Select all that apply

- ☒ 1. Amitriptyline to treat fibromyalgia pain
- ☒ 2. Headache while on Phenelzine
- ☒ 3. Taking St Johns wart with Sertraline
- ☒ 4. Discontinuing **escitalopram** the day before taking Isocarboxazid.
- ☐ 5. Peanut butter and jelly sandwich while on Selegiline
- ☒ 6. Reporting sore throat, fatigue and low grade fever while on clozapine

Notes

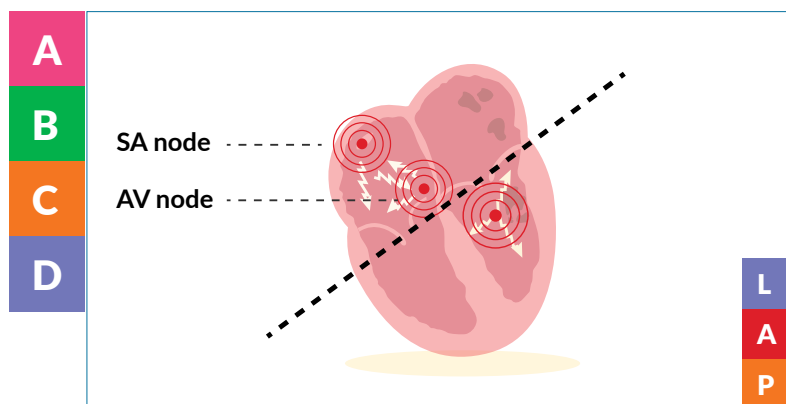
# Antidysrhythmics II

## ABCDs - Atrial Rhythm drugs

### Cardiac Pharmacology

#### MEMORY TRICK

Think **ABCD**, start on the TOP of the heart affecting atrial rhythms affecting the SA or AV node

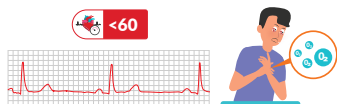


#### Notes

A	Drug Name	Indication & Key Terms:
	Atropine	Symptomatic <b>Bradycardia</b>

Puts the heart rate really HIGH like on TOP of "a PINE" tree for atropINE.

Given for: **"Symptomatic Bradycardia"** below 60 BPM with **signs of low oxygenation** like mental status changes (confusion, altered, agitation) or pale blue skin signs. Goal is to get back to **NORMAL sinus rhythm!**



#### TOP MISSED Test Question

**Atropine** for a client with a heart rate of 38, bp of 88/65, reports **confusion** and **dizziness**. Which ECG strip would show medication effectiveness?

- 1.
- 2.
- 3.
- ✓ 4. **CORRECT**

**60-100**  
8 x 10 = 80  
**Evenly Spaced**

A	Drug Name	Indication & Key Terms:
	Adenosine	SVT (supraventricular <b>tachycardia</b> )

**DE**creases the heart rate, like putting it into a **DEN** (for foxes) or **Downstairs**.

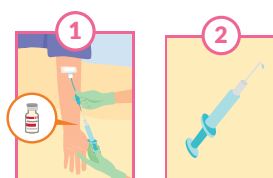
Given for:

SVT - Supraventricular Tachycardia

**\* Key points:**

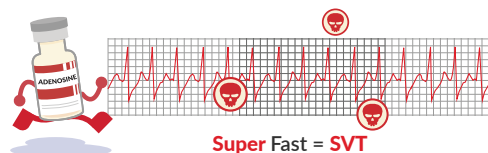
Know how this rhythm looks! SVT = Super Fast!

Give it FAST = IV push in 2 seconds followed by flush



#### KEY Points

1. Give it FAST = **IV push in 1-2 seconds** **NCLEX TIP**
2. Saline Flush immediately **AFTER**



**Super Fast = SVT**

B	Drug Name	Indication & Key Terms:
	Beta Blockers "Propranolol"	<b>Hypertension</b> , SVT, Tachycardia, A fib & A flutter <b>SE:</b> LoL = Low BP, Low HR

Beta blockers end in "-LOL"

**Memory trick:** Lower the 2 L's - Low HR & Low BP

Given for:

Hypertension & to put the brakes on fast rhythms like SVT, tachycardia, A fib, & A flutter.

**Side Effects:**

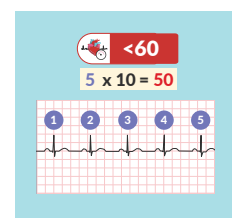
- **B** - Bradycardia (HR below 60 BPM) & low BP
- **B** - Bronchospasm (avoid asthma & COPD)
- **B** - Blood glucose masking s/s of low sugar
- **B** - Bad for clients in end stage heart failure

\* Orthostatic hypotension (dizziness upon standing) - **teach slow position changes!**

#### Common Question

What drug is causing this rhythm?

✓ Propranolol

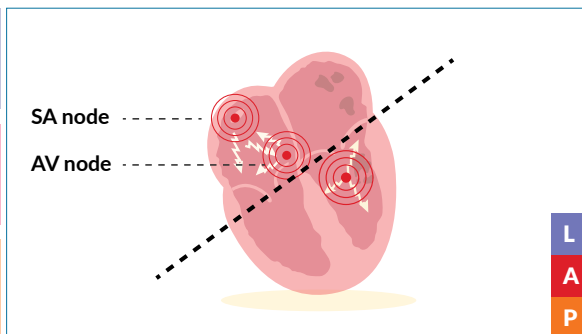


# Antidysrhythmics IV

## LAP - Ventricular Rhythm Drugs

Cardiac Pharmacology

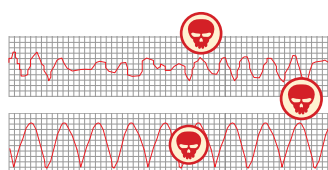
<b>L</b>	<b>Lidocaine</b>
<b>A</b>	<b>Amiodarone</b>
<b>P</b>	<b>Procainamide</b>



Think **LAP** like in your lap, **since these drugs affect ventricular rhythms**

Mainly give for those **deadly ventricular rhythms**:

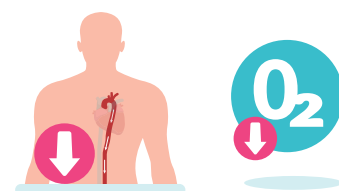
- Ventricular Fibrillation (V Fib)
- Ventricular Tachycardia (V Tach)



**Vfib**

**LOW** cardiac **OUT**put  
**LOW** oxygen **OUT** to the body

**Vtach**



**Memory Trick:**

Any rhythm starting with a **V** = **VERRRY** deadly.

Since the ventricles are responsible for all the Cardiac **OUTPUT** meaning **OXYGEN** rich blood **OUT TO the body**, so low Cardiac **OUT**put means Low oxygen **OUT** to the body.

<b>L</b>	<b>Lidocaine</b>
<b>Key Point</b>	
<ul style="list-style-type: none"> <li>• <b>HYPO</b>tension</li> <li>• Lidocaine Toxicity               <ul style="list-style-type: none"> <li>• Neuro checks are a <b>PRIORITY</b></li> </ul> </li> </ul>	

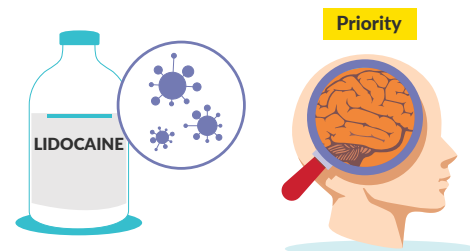
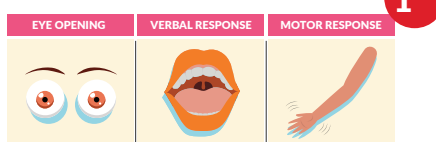
### Lidocaine

"Cain" Calms the ventricles.

Given for:

V tach, & V fib mainly, but also can work for SVT, A fib, & A flutter.

#### GLASGOW COMA SCALE



<b>A</b>	<b>Amiodarone</b>
<b>Key Point</b>	
<b>Pulmonary toxicity</b> <ul style="list-style-type: none"> <li>• "dry cough &amp; dyspnea"</li> <li>• "difficulty breathing while ambulating"</li> <li>• "shortness of breath"</li> </ul>	

### Amiodarone

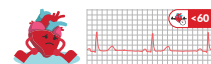
Typically given 2nd if Lidocaine does not work. This is because of its **life-threatening TOXIC** effects!

**Memory trick**



#### Side Effects

Neg. **Chrono**tropic = Less beats



Neg. **Dromo** = Less Electrical impulse



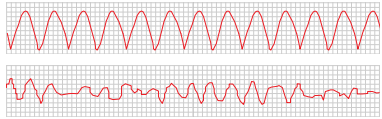
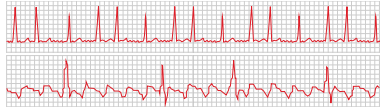
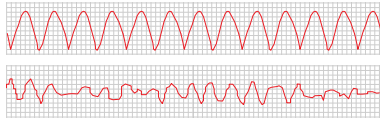
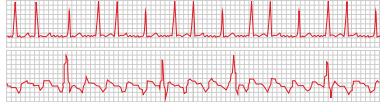



<b>P</b>	<b>Procainamide</b>
----------	---------------------

"Cain" calms those ventricles just like Lidocaine but this drug is becoming less & less popular in the hospital setting & therefore not commonly tested.



# Antidysrhythmics I

## Cardiac Pharmacology

Class	Drug Name	Mainly for	Image of ECG Strip
<b>Class 1</b> Sodium-channel <b>blockers</b>	Pro <u>cain</u> amide & Lidoc <u>aine</u>	V Tach & V Fib	
<b>Class 2</b> Beta <b>blockers</b>	Proprano <u>lol</u>	Atrial Fibrillation Atrial Flutter HTN (hypertension)	
<b>Class 3</b> Potassium-channel <b>blockers</b>	Amiodarone	V Tach & V Fib	
<b>Class 4</b> Calcium-channel <b>blockers</b>	Verapa <u>mil</u> Diltia <u>zem</u> Nife <u>dipine</u>	Atrial Fibrillation Atrial Flutter HTN (hypertension)	
<b>Others</b>	Adenosine	SVT	
	Digoxin (cardiac glycoside)	A Fib	
	Atropine (anticholinergic)	Symptomatic Bradycardia	

### Key Points

- Dizziness
- Teach SLOW position changes

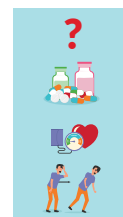
Hypotension - must reassess the BP every hour  
When BP is LOW - we got to go SLOW!



### Top Missed Question

Which drugs do we teach slow position changes due to orthostatic hypotension?  
Select all that apply.

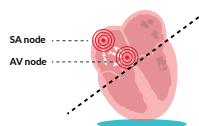
- ✓ 1. Atenolol
- 2. Atropine
- ✓ 3. Amiodarone
- ✓ 4. Amlodipine
- 5. Digoxin
- ✓ 6. Diltiazem
- ✓ 7. Furosemide



### MEMORY TRICK

Think **ABCD** start on TOP of the heart affecting atrial rhythms.  
Think **LAP** like in your lap, since these drugs affect ventricular rhythms.

	Drug Name	Indication & Key Terms:
<b>A</b>	Atropine Adenosine	Symptomatic <b>Bradycardia</b> SVT (supraventricular <b>tachycardia</b> )
<b>B</b>	Beta Blockers "Proprano <u>lol</u> "	<b>Hypertension</b> , SVT, Tachycardia, A fib & A flutter <b>SE:</b> LoL = Low BP, Low HR, <b>bronchospasm</b>
<b>C</b>	Ca Channel Blockers "Verapa <u>mil</u> " "Diltia <u>zem</u> "	<b>Hypertension</b> , SVT, Tachycardia, A fib & A flutter <b>SE:</b> Low BP, Low HR, <b>dizziness</b>
<b>D</b>	Digoxin	A fib & Heart Failure <b>SE:</b> Toxicity (NV, Vision changes)



	Drug Name	Indication & Key Terms:
<b>L</b>	Lidoc <u>aine</u>	V Tach & V Fib <b>SE:</b> Low BP, Low Platelets
<b>A</b>	Amiodarone	V Tach & V Fib <b>SE:</b> Low BP, Low HR, <b>Pulmonary TOXICITY!!!</b>
<b>P</b>	Pro <u>cain</u> amide	V Tach <b>SE:</b> Low BP, Low Platelets

# Antiemetics

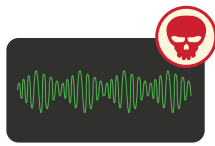
## Anti-Nausea & Vomiting

### Drug name:

**Ondansetron**  
(brand: Zofran)

#### HESI EXIT

Priority side effect: Torsades de Pointes



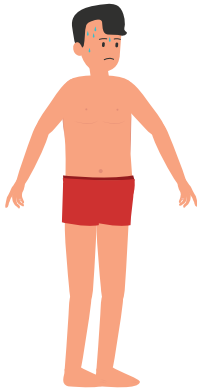
#### KEY POINT



Agitation



Tachicardia



Hypertension



Muscle Rigidity

### Serotonin Syndrome

#### ATI Question

Ondansetron used to decrease Nausea & Vomiting caused by chemo

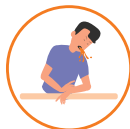
#### HESI Question

Question:

- During infusion, child reports **nausea and vomits**, priority nursing action?

Answer:

- STOP the chemo, flush the line and **administer ondansetron**



### Drug name:

**Metoclopramide**  
(brand: Reglan)

#### HESI

Contraindicated  
- bleeding duodenal ulcer



### Key Point:

**QUESTION**  
prescription "order"  
& **REPORT TO HCP**  
**IMMEDIATELY!!**

#### KEY WORDS

- Lip smacking
- Puffing of cheeks
- Blinking of eyes



### Memory Trick:



**REPORT**

#### KEY POINT

**M - Metoclopramide**

**M - Major lip smacking & puffing cheeks**

### Notes

# Antifungals

## How do they work? “Action”

Antifungal drugs may be fungicidal (able to destroy fungi) or fungistatic (able to slow or retard the multiplication of fungi).

- Amphotericin B (Fungizone IV), miconazole (Monistat), nystatin, voriconazole (Vfend), micafungin (Mycamine), and ketoconazole (Nizoral) are thought to have an effect on the cell membrane of the fungus.
- Fluconazole (Diflucan) has fungistatic activity that appears to result from the depletion of sterols (a group of substances related to fats) in the fungus cells. (Ford 125)
- Griseofulvin (Grisactin) exerts its effect by being deposited in keratin precursor cells, which are then gradually lost (because of the constant shedding of top skin cells) and replaced by new, non infected cells.
- Flucytosine (Ancobon) inhibits DNA and RNA synthesis in the fungus.
- Clotrimazole (Lotrimin, Mycelex) binds with phospholipids in the fungal cell membrane, increasing permeability of the cell and resulting in loss of intracellular components. (Ford 125)

## Indications

- Superficial and deep fungal infections
- Systemic infections such as aspergillosis, candidiasis, and cryptococcal meningitis
- Superficial infections of nail beds and oral, anal, and vaginal areas (Ford 125)

## Contraindications & Caution

- Known hypersensitivity
- Pregnancy
- Both voriconazole and itraconazole are contraindicated in patients taking cisapride, pimozide, or quinidine. The systemic agent itraconazole should not be used to treat fungal nail infections in patients with a history of heart failure. (Ford 127)

## Herbal Considerations

Researchers have identified several antifungal herbs that are effective against skin infections, such as tea tree oil (*Melaleuca alternifolia*) and garlic (*Allium sativum*). Tea tree oil comes from an evergreen tree native to Australia. The herb has been used as a non irritating antimicrobial for cuts, stings, wounds, burns, and acne. It can be found in shampoos, soaps, and lotions. Tea tree oil should not be ingested orally but is effective when used topically for minor cuts and stings.

## Nursing management

Renal damage is the most serious adverse reaction to the use of amphotericin B. Renal impairment usually improves with a modification of the dosage regimen (reduced dosage or increased time between doses). Serum creatinine levels and blood urea nitrogen (BUN) levels are checked frequently during the course of therapy to monitor kidney function. If the BUN exceeds 40 mg/dL or the serum creatinine level exceeds 3 mg/dL, the primary health care provider may discontinue the drug or reduce the dosage until renal function improves. (Ford 128) Before administering fluconazole to an older adult or a patient with renal impairment, the primary health care provider may order a creatinine clearance test. Watch for and report the laboratory results to the primary health care provider because the dosage may be adjusted based on the test results. (Ford 128)

- Clean the involved area and apply the ointment or cream to the skin as directed by the primary health care provider.
- Do not increase or decrease the amount used or the number of times the ointment or cream should be applied unless directed to do so by the primary health care provider.
- Griseofulvin—Beneficial effects may not be noticed for some time; therefore, take the drug for the full course of therapy. Avoid exposure to sunlight and sun lamps because an exaggerated skin reaction (which is similar to severe sunburn) may occur even after a brief exposure to ultraviolet light. Notify the primary health care provider if fever, sore throat, or skin rash occurs. (Ford 128)
- Ketoconazole—Complete the full course of therapy as prescribed by the primary health care provider. Do not take this drug with an antacid. In addition, avoid the use of nonprescription drugs unless use of a specific drug is approved by the primary health care provider. (Ford 128)
- Itraconazole—The drug is taken with food. Therapy continues for at least 3 months until infection is controlled. Report unusual fatigue, yellow skin, darkened urine, anorexia, nausea, and vomiting. (Ford 128)

## Interactions

### Amphotericin B

- **Corticosteroids:** Risk for severe hypokalemia
- **Digoxin:** increased risk of digitalis toxicity
- **Aminoglycosides & Cephalosporins:** increased risk of nephrotoxicity

### Fluconazole

- **Oral hypoglycemics:** increased hypoglycemic effects
- **Phenytoin:** decreased effects of phenytoin

### Griseofulvin

- **Barbiturates:** decrease sedative effect
- **Oral contraceptives:** decreased effects of birth control

## Adverse reactions

- Headache
- Rash
- Anorexia and malaise
- Abdominal, joint, or muscle pain
- Nausea, vomiting, diarrhea (Ford 127)

Generic	Trade	Use	Dose
amphotericin B	Abelcet, AmBisome, Amphotec, Fungizone	Systemic fungal infections, cryptococcal meningitis in patients with HIV infection	Desoxycholate: 1–1.5 mg/kg/day IV Lipid-based: 3–6 mg/kg/day IV
caspofungin	Cancidas	Invasive aspergillosis, hepatic insufficiency	70-mg loading dose IV, followed by 50 mg/day IV for at least 14 days

# Antiprotozoal

## How do they work? "Action"

Antiprotozoal drugs interfere with, or are active against, the life cycle of the protozoan.

## Indications

- Malaria
- Giardiasis
- Toxoplasmosis
- Intestinal amebiasis
- Sexually transmitted infections (trichomoniasis)
- Pneumocystis pneumonia
- Antimalarial drugs are used for suppressing (i.e., preventing) malaria

## Adverse reactions

- Anorexia
- Nausea, vomiting
- Abdominal cramping and diarrhea
- Headache and dizziness
- Visual disturbances or tinnitus
- Hypotension or changes detected on an electrocardiogram (ECG; associated with chloroquine)
- Cinchonism —a group of symptoms associated with quinine administration, including tinnitus, dizziness, headache, GI disturbances, and visual disturbances. These symptoms usually disappear when the dosage is reduced.
- Peripheral neuropathy (numbness and tingling of the extremities), with metronidazole
- Nephrotoxicity and ototoxicity, with paromomycin

## Contraindications & Caution

Quinine should not be prescribed for patients with myasthenia gravis, because it may cause respiratory distress and dysphagia.

## Nursing management

- Follow the dosage schedule exactly as printed on the prescription container. It is absolutely necessary to follow the directions for taking the drug to eradicate the parasite.
- Follow-up stool specimens will be necessary because this is the only way to determine the success of drug therapy.
- When an infection is diagnosed, multiple members of the family may be infected, and all household members may need to be treated. Playmates of the infected child may also need to be treated.
- It is important to wash all bedding and bed clothes once treatment has started.
- Daily bathing (showering is best) is recommended. Disinfect toilet facilities daily, and disinfect the bathtub or shower stall immediately after bathing. Use the disinfectant recommended by the primary health care provider or use chlorine bleach. Scrub the surfaces thoroughly and allow the disinfectant to remain in contact with the surfaces for several minutes.
- During treatment for a ringworm infection, keep towels and facecloths for bathing separate from those of other family members to avoid the spread of the infection. It is important to keep the affected area clean and dry.
- Wash the hands thoroughly after urinating or defecating and before preparing and eating food. Clean under the fingernails daily and avoid putting fingers in the mouth or biting the nails.
- Food handlers should not resume work until a full course of treatment is completed and stools do not contain the parasite.
- Child care workers should be especially careful of diaper disposal and proper hand washing to prevent the spread of infections.
- Report any symptoms of infection (low-grade fever or sore throat) or thrombocytopenia (easy bruising or bleeding).
- Albendazole can cause serious harm to a developing fetus. Inform women of childbearing age of this. Explain that a barrier contraceptive is recommended during the course of therapy and for 1 month after discontinuing the therapy. (Ford 132-133)

## Interactions

- **Antacids:** Decrease absorption of the antimalarial
- **Iron:** Decreased absorption of the antimalarial
- **Digoxin:** Increased risk of digoxin toxicity
- **Cimetidine:** Decreased metabolism of metronidazole
- **Phenobarbital:** Increased metabolism of metronidazole

## Quinine

- Warfarin: Increased risk of bleeding

Generic	Trade	Use	Dose
chloroquine	Aralen	Treatment and prevention of malaria, extraintestinal amebiasis	Treatment: 160–200 mg IM and repeat in 6 hr if necessary Prevention: 300 mg orally weekly; begin 1–2 wk before travel and continue for 4 wk after return from endemic area
doxycycline	Monodox, Vibramycin, Vibra-Tabs	Short-term prevention of malaria	100 mg orally daily, 1–2 days before travel and for 4 wk after return from endemic area (Ford 135)
quinine	Qualaquin	Treatment of malaria	260–650 mg TID for 6–12 days

# Antipsychotics

## Drug name:

1<sup>st</sup> generation Typical  
**HALOPERIDOL**



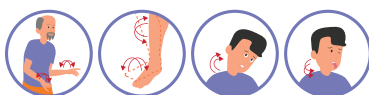
## Indication:

- Schizophrenia
- Tourettes - to control motor movement



## Normal Side Effects:

No need to report to HCP  
- EPS "extrapyramidal symptoms"  
Dystonia (spasm of neck, face & tongue)



### Key point

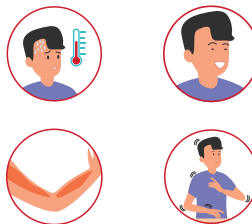
**NEUROLEPTIC MALIGNANT SYNDROME**

**LIFE threatening!**



## Key Signs

- High Fever & Diaphoresis
- Change in Mental Status
- Muscle Rigidity
- Tremors



## Priority Action

- HOLD** Haloperidol
- Assess patient
- NOTIFY HCP** immediately!!!



## Drug name:

2<sup>nd</sup> generation A-typical  
▪ **CLOZAPINE**  
▪ **RISPERIDONE**



## Indication:

Schizophrenia & Schizoaffective who are NOT responding to other antipsychotics



## Normal Side Effects:

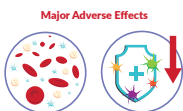
No need to report:  
Weight gain, drooling & sedation



## Killer Side Effects:

### Report To Provider

Leukopenia - Low WBC  
High Risk for Infection

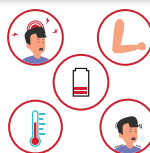


## Memory Trick

**CloZAPine**  
**Zaps WBCS!!**

## Key Points

Sore Throat  
Fever  
Flu like symptoms



## Priority Action

Immediately report to HCP!!



## HESI question:

Which med order for dementia patient Requires intervention by the **NURSE**?

**Risperidone**

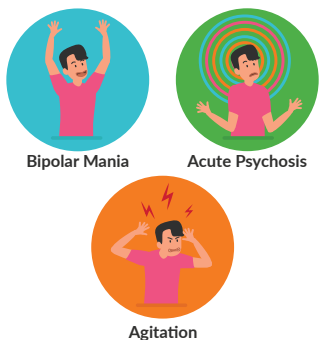
## Drug name:

**Ziprasidone hydrochloride**  
(brand: Geodon)



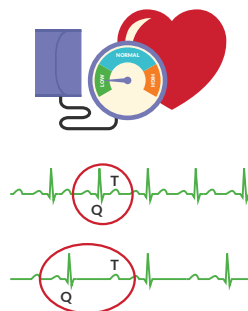
## Indication:

Bipolar mania, acute psychosis & agitation



## KEY POINT

**Hypotension**  
Monitor for **Widened QT intervals**



## MEMORY TRICK

**ZiprasiDONE**



Done prolonged your QT interval & dropped the BP

## Notes

# Antiretrovirals

## How do they work? "Action"

Protease inhibitors, which block the protease enzyme so the new viral particles cannot mature Reverse transcriptase inhibitors, which block the reverse transcriptase enzyme so the HIV material cannot change into DNA in the new cell, preventing new HIV copies from being created Non Nucleoside reverse transcriptase inhibitors, which latch on to the reverse transcriptase molecule to block the ability to make viral DNA Entry inhibitors, which prevent the attachment or fusion of HIV to a host cell for initial entry Integrase inhibitors, which prevent enzymes from inserting HIV genetic material into the cell's DNA (Ford 115)

## Indications

Antiretroviral drugs are used in the treatment of HIV infection and AIDS.

## Adverse reactions

- Nausea, vomiting
- Diarrhea
- Altered taste
- Rash
- Numbness and tingling in the circumoral area (around the mouth) or peripherally, or both

## HERBAL CONSIDERATIONS

- Individuals have tried St. John's wort for both the antidepressive and antiviral effects of the supplement. Researchers have found that in patients with HIV infection who receive prescribed protease inhibitors, the effectiveness of drug therapy is reduced if the patient also takes St. John's wort. Patients need to be instructed to disclose the use of all over-the-counter medications and supplements to their primary health care provider to prevent potentially harmful interactions. (Ford 116)

## Nursing management

- Antiviral drugs are not a cure for viral infections, but they will shorten the course of disease outbreaks and promote healing of the lesions. The drugs will not prevent the spread of the disease to others. Topical drugs should not be applied more frequently than prescribed but should be applied with a finger cot or gloves. All lesions should be covered. There should be no sexual contact while lesions are present. Notify the primary health care provider if burning, stinging, itching, or rash worsens or becomes pronounced.
- Some drugs cause photosensitivity, so precautions should be taken when going outdoors, such as wearing sunscreen, head coverings, and protective clothing. Patients should also refrain from using tanning beds.
- Some patients have experienced an acute exacerbation of the disease when medications used to treat hepatitis B are stopped. Hepatic function should be closely monitored in these patients.

## Nursing alert

Patients receiving antiretroviral drugs for HIV infection may continue to contract opportunistic infections and other complications of HIV disease. Monitor all patients closely for signs of infection such as fever (even low-grade fever), malaise, sore throat, or lethargy. All caregivers are reminded to use good hand hygiene technique. (Ford 118)

## Interactions

- Antifungals: increased serum level of the antiretroviral
- Clarithromycin: Increased serum level of both drugs
- Sildenafil: Increased adverse reactions of sildenafil
- Opioid analgesics: Risk of toxicity with ritonavir
- Anticoagulant, anticonvulsant, antiparasitic agents: Decreased effectiveness when taking ritonavir
- Oral contraceptives: decreased birth control effectiveness

## Contraindications & Caution

Do not administer antiretrovirals if the patient has a history of allergies to the drug or other antiretrovirals. Women who are lactating should not use antiretroviral drugs. Antiretrovirals should not be prescribed to the patient who is using cisapride, pimozide, triazolam, midazolam, or an ergot derivative. Ritonavir is contraindicated if the patient is taking bupropion (Wellbutrin), zolpidem (Ambien), or an antiarrhythmic drug. (Ford 116)

### Generic

### Trade

### Use

### Dose

zidovudine

Retrovir

HIV infection, prevention of maternal-fetal HIV transmission

600 mg/day orally in divided doses; 1 mg/kg IV q 4 hr

lamivudine (3TC)

Epivir, Epivir-HB

HIV infection, chronic hepatitis B infection

HIV: 150 mg orally BID  
HBV: 100 mg/day orally daily

# Antispasmodic - Dicyclomine

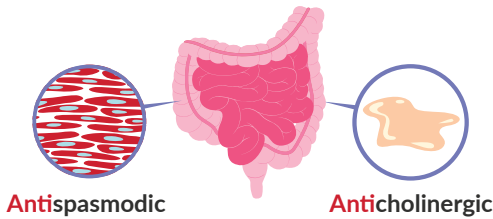
## Drug name:

**Dicyclomine**  
(brand: Bentyl)



## MOA:

Relaxation of smooth muscle & dries secretions



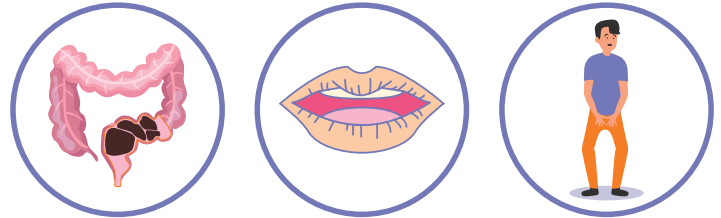
## Indication:

IBS (Irritable bowel syndrome)  
with many loose stools per day



## Side Effect:

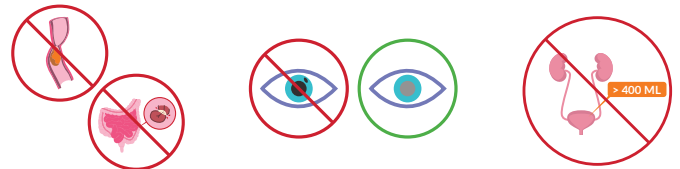
Dry body: Constipation, dry mouth, urine retention



## KEY POINT

### Contraindications AVOID

- **NOT** - Paralytic Ileus or bowel obstruction
- **NOT** - Narrow-angle glaucoma (cataracts are ok!)
- **NOT** - Full bladder ( > 400 mL) "urinary retention"



## MEMORY TRICK

**diCYCLOmine**  
**DRY - cycle**

<p><b>NO pee</b> Not for full bladder</p>	<p><b>NO see</b> Not glaucoma</p>	<p><b>NO spit &amp; NO sh*t</b> Bowel obstruction &amp; Paralytic ileus</p>
---	---------------------------------------	---

## Notes

# Antithyroid Drugs

## How do they work? "Action"

Antithyroid drugs or thyroid antagonists are used to treat hyperthyroidism. In addition to the antithyroid drugs, hyperthyroidism may be treated by the use of radioactive iodine or by surgical removal of some or almost all of the thyroid gland (subtotal thyroidectomy). (Ford 484) Antithyroid drugs inhibit the manufacture of thyroid hormones.

## Indications

- **Methimazole (Tapazole) and propylthiouracil (PTU)** are used for the medical management of hyperthyroidism.
- **Potassium iodide** may be given orally with methimazole or propylthiouracil to prepare for thyroid surgery. (Ford 484)

## Adverse Reactions

- Hay fever, sore throat, skin rash, fever, headache
- Nausea, vomiting, paresthesias
- Agranulocytosis (decrease in the number of white blood cells)
- Exfoliative dermatitis, granulocytopenia, hypoprothrombinemia
- Drug-induced hepatitis (Ford 485)

## Contraindications

Mothers taking methimazole or propylthiouracil should not breastfeed their children. Radioactive iodine (pregnancy category X) is contraindicated during pregnancy and lactation. Methimazole and propylthiouracil are used with extreme caution during pregnancy (pregnancy category D) because they can cause hypothyroidism in the fetus. However, if an antithyroid drug is necessary during pregnancy, propylthiouracil is the preferred drug, because it does not cross the placenta. The potential for bleeding increases when these products are taken with oral anticoagulants. (Ford 485)

## Adverse effects of PTU

- Numbness
- Headache
- loss of hair
- skin rash
- nausea, vomiting
- agranulocytosis

## Nursing management

- Take these drugs at regular intervals around the clock (e.g., every 8 hours) unless directed otherwise by the primary health care provider.
- Do not take these drugs in larger doses or more frequently than as directed on the prescription container.
- Notify the primary health care provider promptly if any of the following occur: sore throat, fever, cough, easy bleeding or bruising, headache, or a general feeling of malaise.
- Record weight twice a week and notify the primary health care provider if there is any sudden weight gain or loss. (Note: the primary health care provider may also want the patient to monitor pulse rate. If this is recommended, the patient needs instruction in the proper technique and a recommendation to record the pulse rate and bring the record to the primary health care provider's office or clinic.)
- Avoid the use of nonprescription drugs unless the primary health care provider has approved the use of a specific drug. (Ford 486)

## Interactions:

- **Digoxin, beta (β) blockers:** Decreased effectiveness of cardiac drug
- **Oral antidiabetics and insulin:** Increased risk of hypoglycemia
- **Oral anticoagulants:** Prolonged bleeding
- **Selective serotonin reuptake inhibitor (SSRI) antidepressants:** Decreased effectiveness of thyroid drug
- **All other antidepressant drug categories:** Increased effectiveness of thyroid drug (Ford 483)

### Generic

### Trade

### Dose

### Route

Propylthiouracil

None

Hyperthyroidism

5–40 mg/day orally, divided doses at 8-hr intervals

# Antivirals

## How do they work? "Action"

Antiviral drugs work by interfering with the virus's ability to reproduce in a cell. Antiviral drugs can be toxic to human cells, and viruses can develop resistance to antiviral drugs

## Indications

- Cytomegalovirus (CMV) in transplant recipients
- Herpes simplex virus (HSV) 1 and 2 (genital) and herpes zoster
- Human immunodeficiency virus (HIV)
- Influenza A and B (respiratory tract illness)
- Respiratory syncytial virus (RSV; severe lower respiratory tract infection primarily affecting children)
- Hepatitis B and C

## Adverse reactions

- Nausea, vomiting
- Diarrhea
- Headache
- Rash
- Fever
- Insomnia

## Contraindications & Caution

Do not administer antivirals if the patient has a history of allergies to the drug or other antivirals. Cidofovir (Vistide) should not be given to patients who have renal impairment or in combination with medications that are nephrotoxic, such as aminoglycosides. Ribavirin should not be used in patients with unstable cardiac disease. These drugs should be used during pregnancy (pregnancy categories B and C) and lactation only when the benefit outweighs the risk to the fetus or child (ribavirin is a pregnancy category X).

## Nursing alert

- Zanamivir (Relenza) is taken every 12 hours for 5 days using a "Diskhaler" delivery system. If a bronchodilator is also prescribed for use at the same time, the bronchodilator is used before the zanamivir. The drug may cause dizziness. The patient should use caution when driving an automobile or operating dangerous machinery. Treatment with this drug does not decrease the risk of transmission of influenza to others.

## Nursing management

- Antiviral drugs are not a cure for viral infections, but they will shorten the course of disease outbreaks and promote healing of the lesions. The drugs will not prevent the spread of the disease to others. Topical drugs should not be applied more frequently than prescribed but should be applied with a finger cot or gloves. All lesions should be covered. There should be no sexual contact while lesions are present. Notify the primary health care provider if burning, stinging, itching, or rash worsens or becomes pronounced.
- Some drugs cause photosensitivity, so precautions should be taken when going outdoors, such as wearing sunscreen, head coverings, and protective clothing. Patients should also refrain from using tanning beds.
- Some patients have experienced an acute exacerbation of the disease when medications used to treat hepatitis B are stopped. Hepatic function should be closely monitored in these patients.
- Those taking antiretrovirals should be cautioned that there is an increased risk of adverse reactions (hypotension, visual disturbances, prolonged penile erection) when the drug sildenafil (Viagra) is used. Symptoms should be reported promptly to the primary health care provider.
- Some drugs affect mental status. Activities requiring mental alertness, such as driving a car, should be delayed until the effect of the drug is apparent because vision and coordination can be affected. Patients should rise slowly from a prone to a sitting position to decrease the possibility of lightheadedness caused by orthostatic hypotension. Changes such as nervousness, tremors, slurred speech, or depression should be reported.
- Some patients are on an alternate-dosage schedule. In this case, it is important to designate the days the drug is to be taken; calendars are helpful aids to track schedules.
- Zanamivir (Relenza) is taken every 12 hours for 5 days using a "Diskhaler" delivery system. If a bronchodilator is also prescribed for use at the same time, the bronchodilator is used before the zanamivir. The drug may cause dizziness. The patient should use caution when driving an automobile or operating dangerous machinery. Treatment with this drug does not decrease the risk of transmission of influenza to others.

## Interactions

- Probenecid: Increased serum levels of the antivirals
- Cimetidine: Increased serum level of the antiviral valacyclovir
- Ibuprofen: Increased serum level of the antiviral adefovir
- Imipenem-cilastatin: With ganciclovir only, increased risk of seizures
- Anticholinergic agents: With amantadine only, increased adverse reactions of anticholinergic agent
- Theophylline: With acyclovir only, increased serum level of theophylline

### Generic

### Trade

### Use

### Dose

acyclovir

Zovirax

HSV, herpes zoster, varicella zoster

Oral: 200–800 mg q 4 hr for 5 doses per day, treat for 5–10 days; IV: 5–10 mg/kg q 8 hr; Topical: apply to lesions q 3 hr

oseltamivir

Tamiflu

Prevention and treatment of influenza A and B

75 mg orally BID for 5 days

# Anxiolytics

## Class:

Benzodiazepines

## Drug names:

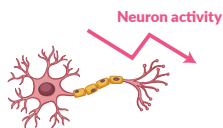
- “-lam”  
Alprazo**LAM**  
Midazo**LAM**
- “-pam”  
Temaze**PAM**  
Clonaze**PAM**

## Indication:

Anxiety, seizures

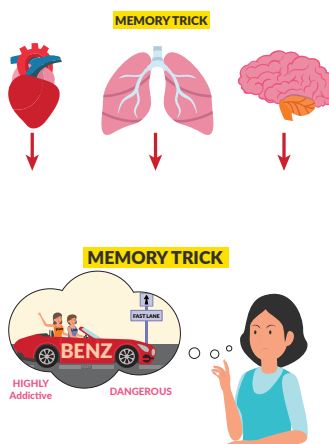
## MOA:

Increases GABA



## Side Effects:

Low & slow vitals  
& brain



## KEY POINT:

- Take at bedtime **NCLEX TIP**
- Don't skip doses **NCLEX TIP**
- Stop drinking alcohol (wine)
- Do not operate dangerous machines
- Antidote Benzos: Flumazenil  
Antidote Opioids: Naloxone  
(brand: Narcan)



## Class:

Barbiturates

## Drug name:

Pheno**barbital**

## GOOD NEWS

Lasts **LONGER**  
in the body



## BAD NEWS

Take **LONGER**  
to get out of the body

Higher risk for **Toxicity**  
leading to hypotension,  
Respiratory depression

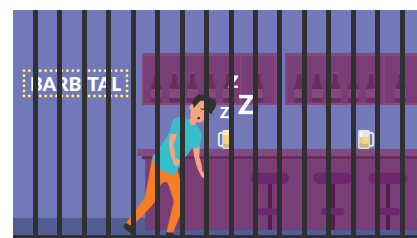
## HESI Question

Is a scenario of a patient,  
on phenobarbital with  
low blood pressure &  
increased sedation!



## Memory Trick:

Sedation like at a bar &  
lasts a long time,  
like stuck behind bars



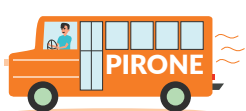
## Drug name:

Buspirone

## KEY POINT

- 2 - 4 weeks for full effect
- **NO Withdrawal symptoms!**
- NO sedation

## Memory Trick:



**BAD NEWS**  
Takes a **LONG TIME**  
to kick in

## Patient Teaching:

- OK to drive
- “drive the BUSpirone”
- NOT used for acute attacks



## 2 Common Test questions for Anxiolytics:

Patient teaching for Diazepam?  
Select All That Apply

- ✓ 1. Avoid valerian root
- 2. Avoid Ginkgo and Ginseng
- ✓ 3. Avoid muscle relaxants
- ✓ 4. Report history of reaction to midazolam
- 5. Naloxone is the antidote for this med.
- 6. Decrease alcohol consumption

Client on phenobarbital, which of the  
follow should the nurse do? **SATA**

- 1. Monitor for hypertension
- ✓ 2. Assess for respiratory depression
- ✓ 3. Assess for low blood pressure
- 4. Teach patient there is NO withdrawal symptoms
- ✓ 5. Teach sedation is an early side effect

## Notes

# Antihypertensives

## Angiotension Receptor Blockers

### How it works? "Action"

Block the binding of angiotensin 2 at various sites on smooth muscle, blocking the vasoconstriction effects of the renin-angiotensin-aldosterone system thus causing a decrease in blood pressure.

### Why do we give it? "Reason"

- Treatment of hypertension

### Adverse effects

**CNS:** dizziness, fatigue, headache, insomnia, weakness.  
**CV:** chest pain, edema, hypotension.  
**EENT:** nasal congestion.  
**Endo:** hypoglycemia, weight gain.  
**GI:** diarrhea, abdominal pain, dyspepsia, nausea.  
**GU:** impaired renal function.  
**F and E:** hyperkalemia.  
**MS:** back pain, myalgia.  
**Misc:** ANGIOEDEMA, fever.

### Contraindications

- ACE1/Angiotensin receptor blockers: HF, salt or volume depletion, bilateral stenosis, angioedema, pregnancy 2nd/3rd trimester due to neonatal death.

### Nursing management

- Monitor BP and pulse frequently
- Assess patient for signs of angioedema (dyspnea, facial swelling).
- Heart Failure: Monitor weight and assess patient routinely for resolution of fluid overload (peripheral edema, rales/crackles, dyspnea, weight gain, jugular venous distention).
- May cause hyperkalemia.
- Instruct your clients to get up slowly and avoid salt substitutes.

### Interactions:

- **NSAIDs:** Reduced hypotensive effects
- **Rifampin:** Decreased ace1 effects
- **Allopurinol:** Increased risk of hypersensitivity
- **Digoxin:** Decreased dig levels
- **Loop diuretics:** Decrease diuretic effects
- **Lithium:** Possible lithium toxicity
- **Hypoglycemics(insulin):** Increase risk of hypoglycemia
- **Potassium sparing diuretics:** Elevated potassium levels ( hyperkalemia )

### Simple Nursing Brain bits

- Be mindful of suffixes! All ARBS end in "TAN"  
These replace ACE in african american population and when the side effects of ace become too much the client.

Generic	Trade	Safe Dose	Route
Irbesartan	Apravo	150 mg once daily	PO
Losartan	Cozaar	50 mg once daily	PO
Valsartan	Diovan	80 mg or 160 mg once daily	PO

# Atropine

## Symptomatic Bradycardia

### Drug name:

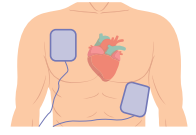
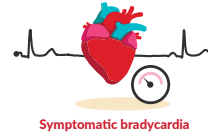
Atro**PINE**



### Memory tricks



### Side Note

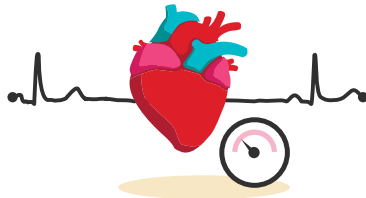


### Indication:

Given to speed up a slow heart rate with

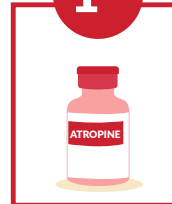
### Key word

**Symptomatic**  
bradycardia

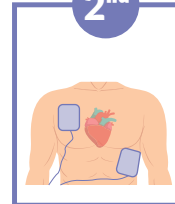


If drugs do not work to fix the problem, then we have to put the patient on external pacing:

1<sup>st</sup>



2<sup>nd</sup>

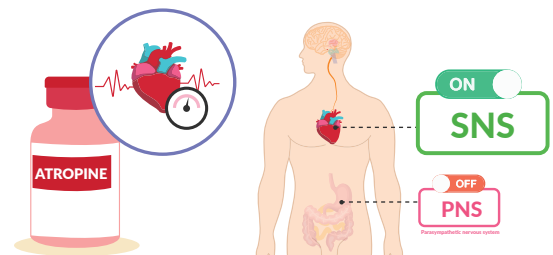


Correct sequence:

1. Atropine
2. External pacing

### MOA:

Atropine acts to increase the heart rate by blocking the action of the vagus nerve to block the PNS (parasympathetic nervous system) REST & DIGEST, and turns ON the SNS (fight & flight) in the heart like flicking a light switch.



### Signs: Symptomatic bradycardia

Mental status changes

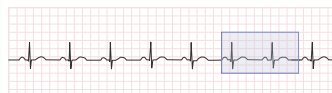
1. Confusion
2. Irritability
3. Agitation



### Key points

Atropine is effective when we see normal sinus rhythm and reversal of the symptoms. They will show you normal sinus rhythm like this & no more hypoxic symptoms, like confusion, agitation, hypotension or syncope.

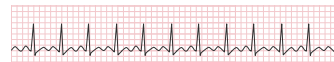
**Normal Sinus rhythm**  
and reversal of the symptoms



### Common NCLEX Question

**Atropine** for a client with a heart rate of 38, bp of 88/65, reports **confusion** and **dizziness**. Which ECG strip would show medication effectiveness?

☐ 1.



☐ 2.



☐ 3.



☒ 4.



**CORRECT**

**60-100**

**R peak x 10**  
**8 x 10 = 80**

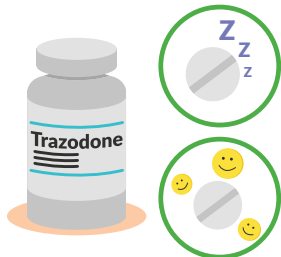
# Atypical Antidepressant

## Drug name:

**Trazodone**

KEY WORD

**Avoid** ETOH  
& other sedatives



## Indication:

Depression & Sleep aid



## Side Effects & Memory Trick:

Sleepy and sedated

**TraZZZadone**



**TRANCEadone**



- Avoid ETOH & other sedatives (benzos, antihistamines)



- Take at night

- Orthostatic hypotension =  
Teach: Slow position changes



- Rare: Priapism (erection)  
Teach: Erection that lasts for hours - go to hospital!

## Drug name:

**Bupropion SR, XL**

Brand: Wellbutrin



## Indication:

Depression & aid to stop smoking

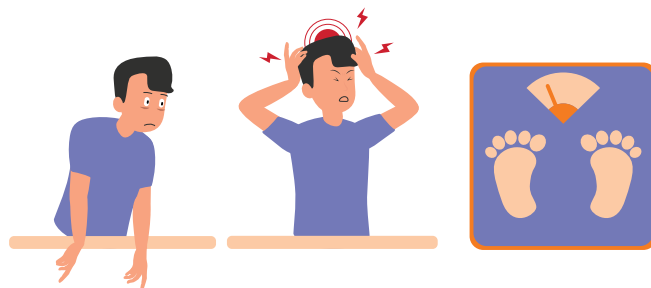


## Side Effects:

Insomnia,

HA,

weight loss



## Patient Teaching:

### KEY POINT

- XL, SR pill
- NEVER crush, chew, cut



- Never "double up" on missed dose
- Do not crush XR - extended release or SR - Sustained release

## Notes

# Antihypertensives

## Beta Blockers

### How it works? "Action"

Block beta receptors in the heart to decrease cardiac workload to decrease HR and dilate blood vessels, provides membrane stabilizing effects. Timolol treats glaucoma.

### Why do we give it? "Reason"

- Hypertension
- Cardiac arrhythmia
- Heart failure
- Angina
- Glaucoma
- Prevention of MI

### Adverse effects

**CV:** Orthostatic hypotension, bradycardia, PULMONARY EDEMA,

**ENDO:** May cause  $\uparrow$  BUN, serum lipoprotein, potassium, triglyceride, and uric acid levels. May cause  $\uparrow$  blood glucose levels. In labile diabetic patients, hypoglycemia may be accompanied by precipitous  $\uparrow$  of BP.

**RESP:** bronchospasm (hx of asthma)

### Contraindications

- Sinus bradycardia
- Heart block
- Heart Failure
- Asthma
- Emphysema
- Hypotension

### Nursing management

- Monitor BP, heart rate, ECG, cardiac output, CVP, and urinary output continuously
- Abrupt withdrawal of propranolol may precipitate life-threatening arrhythmias, hypertension, or myocardial ischemia
- Take HR and BP immediately prior to administering medication and 30 minutes after. Observe provider's parameters to hold drug if BP and/or HR are low.
- Advise patient to notify health care professional if slow pulse, difficulty breathing, wheezing, cold hands and feet, dizziness, lightheadedness, confusion, depression, rash, fever, sore throat, unusual bleeding, or bruising occur. If diabetic monitor for hypoglycemia. Teach not to stop taking abruptly.

### Interactions:

- **Antidepressants:** bradycardia and increase beta blocker effects
- **NSAID:** decrease beta blocker effects
- **Diuretics:** increase beta blocker effects/hypotension
- **Clonidine:** paradoxical hypertensive effects
- **Cimetidine:** beta blocker toxicity
- **Lidocaine:** beta blocker toxicity

### Simple Nursing Brain bits

- **Never give a beta blocker to a client with a history of asthma because it can cause bronchospasm.**
- Beta Blockers end in -OLOL

#### 4 B'S

- Bradycardia
- Blood pressure decrease
- Bronchial constriction (relief)
- Blood sugar masking

Generic	Trade	Safe Dose	Route
Propranolol	Inderal, Inderal LA, InnoPran XL	80– 320 mg/day in 2– 4 divided doses	PO, IV , PO-ER
Metoprolol: lopressor	lopressor	25– 100 mg/day as a single dose	PO, IV , PO-ER
Sotalol Give on an empty stomach	Betapace, Betapace AF	80 mg twice daily	PO
Timolol Ophthalmic	Novo-Timol	One drop of 0.25% eye drops into each affected eye(s) twice daily, approximately 12 hours apart.	Ophthalmic

# Anticonvulsants

## - Benzodiazepines

### How do they work? "Action"

Benzodiazepines elevate the seizure threshold by decreasing postsynaptic excitation. Benzos are specific to treatment of status epilepticus.

### Indications

- Seizures of all types
- Neuropathic pain
- Bipolar disorders
- Anxiety disorders

### Adverse Reactions

- Nystagmus (constant, involuntary movement of the eyeball)
- Ataxia (loss of control of voluntary movements, especially gait)
- Slurred speech
- Gingival hyperplasia (overgrowth of gum tissue)

### Contraindications

All categories of anticonvulsants are contraindicated in patients with known hypersensitivity to the drugs. Benzodiazepines are used cautiously during pregnancy (pregnancy category D) and in patients with psychoses, patients with acute narrow-angle glaucoma, and older or debilitated patients.

### Interactions

- Antibiotics/antifungals: Increased effect of the anticonvulsant
- Tricyclic antidepressants: Increased effect of the anticonvulsant
- Salicylates: Increased effect of the anticonvulsant
- Cimetidine: Increased effect of the anticonvulsant
- Theophylline: Decreased serum levels of the anticonvulsant
- Antiseizure medications: May increase seizure activity
- Protease inhibitors: Increased carbamazepine levels, resulting in toxicity
- Oral contraceptives: Decreased effectiveness of birth control, resulting in breakthrough bleeding or pregnancy
- Analgesics or alcohol: Increased depressant effect
- Antidiabetic medications: Increased blood glucose levels

### Fun Fact

- Research suggests an association between the use of anticonvulsants by pregnant women with epilepsy and an increased incidence of birth defects. The use of anticonvulsants is not discontinued in pregnant women with a history of major seizures because of the danger of precipitating status epilepticus. However, when seizure activity poses no serious threat to the pregnant woman, the primary health care provider may consider discontinuing use of the drug during pregnancy.
- Recurrence of seizure activity may result from abrupt discontinuation of the drug, even when the anticonvulsant is being administered in small daily doses
- Hematologic changes (e.g., aplastic anemia, leukopenia, and thrombocytopenia) need to be reported immediately. Teach the patient how to identify signs of thrombocytopenia (bleeding gums, easy bruising, increased menstrual bleeding, tarry stools) or leukopenia (sore throat, chills, swollen glands, excessive fatigue, or shortness of breath) and to contact the primary health care provider..

### Nursing management

- Do not omit, increase, or decrease the prescribed dose.
- Anticonvulsant blood levels must be monitored at regular intervals, even if the seizures are well controlled.
- This drug should never be abruptly discontinued, except when recommended by the primary health care provider.
- Do not attempt to put anything in the mouth of a person having a seizure.
- If the primary health care provider finds it necessary to stop the drug, another drug usually is prescribed. Start taking this drug immediately (at the time the next dose of the previously used drug was due).
- Anticonvulsant drugs may cause drowsiness or dizziness. Observe caution when performing hazardous tasks. Do not drive unless the adverse reactions of drowsiness, dizziness, or blurred vision are not significant. Driving privileges will be approved or reinstated by the primary health care provider based on seizure control.
- Avoid the use of alcohol unless use has been approved by the primary health care provider.
- Wear medical identification, such as a Medic Alert tag or bracelet, indicating drug use and the type of seizure disorder.

### Generic

### Trade

### Use

### Dose

**Diazepam**

Valium

Status epilepticus, seizure disorders (all forms), anxiety disorders, alcohol withdrawal

Seizure control: 2–10 mg/day orally BID to QID  
Status epilepticus: 5–10 mg IV initially, maximum dose 30 mg  
Rectally: 0.2–0.5 mg/kg

# Neuromuscular Drugs

## - Cholinergic Blocking Drugs

### How do they work? "Action"

Drugs with cholinergic blocking activity block ACh in the CNS, enhancing dopamine transmission.

### Indications

Adjunctive therapy in all forms of Parkinson-like symptoms and in the control of drug-induced extrapyramidal disorders.

### Adverse Reactions

- Dry mouth
- Blurred vision
- Dizziness, mild nausea, and nervousness
- Skin rash, urticaria (hives)
- Urinary retention, dysuria
- Tachycardia, muscle weakness
- Disorientation and confusion

### Contraindications

- Glaucoma (angle-closure glaucoma)
- Pyloric or duodenal obstruction
- Peptic ulcers, prostatic hypertrophy, achalasia (failure of the muscles of the lower esophagus to relax, causing difficulty swallowing), myasthenia gravis, and megacolon.

### Interactions

- **Amantadine:** Increased anticholinergic effects
- **Digoxin:** Increased digoxin serum levels
- **Haloperidol:** Increased psychotic behavior
- **Phenothiazines:** Increased anticholinergic effects

### Drugs with Parkinson-Like Adverse Reactions

The following drugs can produce symptoms similar to Parkinson's disease, also known as extrapyramidal symptoms (EPS), which may be treated with similar drugs to reduce the adverse reactions:

- Antidepressants
- Antiemetics
- Antipsychotics—first generation
- Lithium
- Stimulants
- Individuals older than 60 years frequently develop increased sensitivity to anticholinergic drugs and require careful monitoring. Confusion and disorientation may occur. Lower doses may be required.

### Nursing management

- If dizziness, drowsiness, or blurred vision occurs, avoid driving or performing other tasks that require alertness.
- Avoid the use of alcohol unless use has been approved by the primary health care provider.
- Relieve dry mouth by sucking on hard candy (unless the patient has diabetes) or taking frequent sips of water. Consult a dentist if dryness of the mouth interferes with wearing, inserting, or removing dentures or causes other dental problems.
- Keep all appointments with the primary health care provider or clinic personnel because close monitoring of therapy is necessary.
- Ask your primary health care provider before buying vitamin supplements when taking levodopa. Vitamin B6 (pyridoxine) may interfere with the action of levodopa.

Generic	Trade	Use	Dose
<b>Benztropine</b>	Cogentin	Parkinson's disease, drug-induced EPS	0.5–6 mg/day orally Acute dystonia: 1–2 mL IM or IV
<b>Diphenhydramine</b>	Benadryl	Drug-induced EPS, allergies 2	25–50 mg orally TID or QID

# Beta 2 Agonist

## Drug name:

### B - Beta 2 Agonist

"-buterol"

Al**buterol**

Leval**buterol**

**B** - Buterol

**B** - Brutal Asthma Attacks



## Indication:

1st drug used during  
**SEVERE** asthma attacks

### NCLEX TIP

- THE ONLY "rescue inhaler"
- **BEFORE steroid inhaler!!!!**
  - **S** - Salmeterol
  - **S** - Slower Acting (NOT rescue inhaler)



### Common NCLEX Question

DO NOT use fluticasone or salmeterol for first sign of acute asthma attack!



### MEMORY TRICK

**AIM** for Acute Asthma Attack

**A** - Al**buterol** 1st

**I** - Ipr**atropium** 2nd

**M** - Methyl-predniso-**lone**  
(brand: Solu Medrol)



Expected SE: **AlbuTerol**

**T**

Tachycardia & palpitations



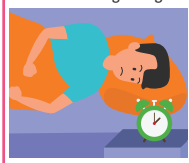
**T**

Tremor



**T**

Toss & Turning at Night



Insomnia & difficulty sleeping

**TEST TIP!!**

## HESI Question

Albuterol Nebulizer Expected Findings After Treatment:

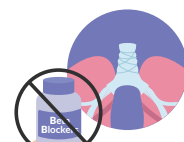
- ✓ Increased productive cough
- ✓ Reports of decreased anxiety
- ✓ Mild Bilateral hand tremors



## NCLEX TIPS

### AVOID

Beta Blockers – Atenolol  
NSAIDS – Naproxen, Ibuprofen



### KEY POINTS



**SHAKE IT WELL!**

Shake **IT** Before you take **IT**

### KEY POINTS

If Not working after **3 doses?**

- NOTIFY HCP!!!

Effective:

- **Decrease** in **RR** (example: 34 to 24)
- **Oxygen Sat.** at least **90%** or higher

**HCP**

**24**

**RR**

**HCP**

**90 %**

**Oxygen**

## Notes

# PNS Drugs

## - B-Adrenergic Blockers

### How do they work? "Action"

These drugs decrease the heart's excitability, decrease cardiac workload and oxygen consumption, and provide membrane-stabilizing effects that contribute to the antiarrhythmic activity of the  $\beta$ -adrenergic blocking drugs. Examples of  $\beta$ -adrenergic blocking drugs used for cardiac purposes are esmolol (Brevibloc) and propranolol (Inderal). (Ford 256)

### Indications

- Hypertension (first-choice drug for patients with stable angina)
- Cardiac arrhythmia (abnormal rhythm of the heart), such as ventricular or supraventricular tachycardia
- Migraine headaches
- Heart failure (HF)
- Angina pectoris
- Glaucoma (topical ophthalmic eye drops) (Ford 256)

### Adverse Reactions

Cardiac reactions that affect the body in a generalized manner include orthostatic hypotension, bradycardia, dizziness, vertigo, and headache. Gastrointestinal (GI) reactions include hyperglycemia, nausea, vomiting, and diarrhea. Another bodily system reaction is bronchospasm (especially in those with a history of asthma). (Ford 256)

### Contraindications

These drugs are contraindicated in patients with an allergy to  $\beta$  blockers; in patients with sinus bradycardia, second or third-degree heart block, or HF; and in those with asthma, emphysema, and hypotension. The drugs are used cautiously in patients with diabetes, thyrotoxicosis, or peptic ulcer. (Ford 256)

### Interactions

- **Antidepressants (monoamine oxidase inhibitors [MAOIs], selective serotonin reuptake inhibitors [SSRIs]):** Increased effect of the  $\beta$  blocker, bradycardia
- **Nonsteroidal anti-inflammatory drugs (NSAIDs), salicylates:** Decreased effect of the  $\beta$  blocker
- **Loop diuretics:** Increased risk of hypotension
- **Clonidine:** Increased risk of paradoxical hypertensive effect
- **Cimetidine:** Increased serum level of the  $\beta$  blocker and higher risk of  $\beta$  blocker toxicity
- **Lidocaine:** Increased serum level of the  $\beta$  blocker and higher risk of  $\beta$  blocker toxicity

### Nursing Alert

Hypertension research studies demonstrate better patient outcomes for African Americans when  $\beta$  blockers are used in combination with diuretics than other drugs alone to treat hypertension, such as angiotensin-converting enzyme (ACE) inhibitors (Ferdinand, 2007). (Ford 256)

### Nursing management

- Do not stop taking the drug abruptly, except on the advice of the primary health care provider. Most of these drugs require that the dosage be gradually decreased to prevent precipitation or worsening of adverse effects.
- Notify the primary health care provider promptly if adverse drug reactions occur.
- Observe caution while driving or performing other hazardous tasks because these drugs ( $\beta$ -adrenergic blockers) may cause drowsiness, dizziness, or lightheadedness.
- Immediately report any signs of HF (weight gain, difficulty breathing, or edema of the extremities).
- Do not use any nonprescription drug (e.g., cold or flu preparations or nasal decongestants) unless you have discussed use of a specific drug with the primary health care provider.
- Inform dentists and other primary health care providers of therapy with this drug.
- Keep all primary health care provider appointments because close monitoring of therapy is essential.
- Check with a primary health care provider or clinical pharmacist to determine if the drug is to be taken with food or on an empty stomach. (Ford 259-260)

Generic	Trade	Use	Dose
<b>Acebutolol</b>	Sectral	Hypertension, ventricular arrhythmias H	Hypertension: 400 mg orally in 1–2 doses Arrhythmias: 400–1200 mg/day orally in divided doses
<b>Propranolol</b>	Inderal	Cardiac arrhythmias, MI, angina, hypertension, migraine prophylaxis, hypertrophic subaortic stenosis, pheochromocytoma, essential tremor	Arrhythmias: 10–30 mg orally TID, QID Hypertension: 120–240 mg/day orally in divided doses, Angina: 80–320 mg/day orally in divided doses, Migraine: 160–240 mg/day orally in divided doses

# Skeletal Muscle Drugs

## - Bisphosphonates

### How do they work? "Action"

Bisphosphonates act primarily on the bone by inhibiting normal and abnormal bone resorption. This results in increased bone mineral density, reversing the progression of osteoporosis.

### Indications

- Osteoporosis in postmenopausal women and men (caused by glucocorticoid use)
- Hypercalcemia (increased serum calcium) of malignant diseases and bony metastasis of some solid tumors
- Paget's disease of the bone

### Adverse Reactions

- Increased or recurrent bone pain
- Headache
- Dyspepsia (GI discomfort), acid regurgitation, dysphagia
- Abdominal pain

### Contraindications

- Alendronate (Fosamax) and risedronate (Actonel) are contraindicated in patients with hypocalcemia. Alendronate is a pregnancy category C drug and is contraindicated during pregnancy.
- Delayed esophageal emptying or renal impairment. Concurrent use of these drugs with hormone replacement therapy is not recommended.

### Interactions

- **Calcium supplements or antacids with magnesium and aluminum:** Decreased effectiveness of bisphosphonates
- **Aspirin:** Increased risk of GI bleeding
- **Theophylline:** Increased risk of theophylline toxicity

### Nursing management

- When bisphosphonates are administered, serum calcium levels are monitored before, during, and after therapy.
- When to treat. Diagnosis for osteoporosis treatment is made by your T-score (from the bone mineral density scan). You may not be a candidate for treatment if you have gastroesophageal problems, kidney disease, or severe vitamin D deficiency. Some preparations are taken daily and others as infrequently as monthly. Research shows good results when taken for 5 to 10 years—so correct administration is important.
- Supplements. These drugs work by using the building blocks of bone formation. You need an intake of 1500 mg of calcium and 400 to 800 units of vitamin D daily. The drug you take may or may not have this supplement in the preparation. Check with your primary health care provider and follow the vitamin supplement recommended.
- Specific drug administration routine. These drugs are absorbed slowly from the stomach and can cause severe irritation of the esophagus. You must take the pill with 6 to 8 ounces of plain water and cannot eat or drink for 30 minutes after taking the drug, and you must be in an upright position during that time. Here are suggestions to make taking this drug easier and build it into your weekly routine:
  - Use a calendar or cell phone alert to remember your monthly dose.
  - Put the medication out the night before in a place you will see it when you first get up out of bed.
  - Take your medication and then do a distracting activity, such as taking your morning shower or sitting in a chair and watching the morning news on television, listening to music on the radio, or looking at or answering email.
  - Make this morning's breakfast special with foods you especially like to eat; use breakfast as a reward for having taken your medication correctly!
  - Make a habit of calling your primary health care provider at least every 6 months (if taking monthly) to talk about whether you are or are not having any GI changes (belching, pressure, heartburn)—it could be from the medication.

Generic	Trade	Use	Dose
<b>Alendronate</b>	Fosamax	Treatment and prevention of postmenopausal osteoporosis, glucocorticoid-induced osteoporosis, osteoporosis in men, Paget's disease	5–10 mg orally, in daily or (70-mg) weekly doses
<b>Pamidronate</b>	Aredia	Hypercalcemia of malignancy, Paget's disease	60–90 mg in a single IV dose infused over 2–24 hr

# Urinary Drugs

## - Antispasmodics

### How do they work? "Action"

Antispasmodics are cholinergic blocking drugs that inhibit bladder contractions and delay the urge to void. These drugs counteract the smooth muscle spasm of the urinary tract by relaxing the detrusor and other muscles through action at the parasympathetic nerve receptors (Ford 518)

### Contraindications

Antispasmodics are cholinergic blocking drugs that inhibit bladder contractions and delay the urge to void. These drugs counteract the smooth muscle spasm of the urinary tract by relaxing the detrusor and other muscles through action at the parasympathetic nerve receptors (Ford 518)

### Indications

- **Flavoxate** (Urispas) is used to relieve symptoms of dysuria (painful or difficult urination), urinary urgency, nocturia (excessive urination during the night), suprapubic pain and frequency, and urge incontinence.
- **Other antispasmodic** drugs are also used to treat bladder instability (i.e., urgency, frequency, leakage, incontinence, and painful or difficult urination) caused by a neurogenic bladder (impaired bladder function caused by nervous system abnormality, typically an injury to the spinal cord). (Ford 518)

### Interactions

- **Antibiotics/antifungals:** Decreased effectiveness of anti-infective drug
- **Meperidine, flurazepam, phenothiazines:** Increased effect of the antispasmodic
- **Tricyclic antidepressants:** Increased effect of the antispasmodic
- **Haloperidol (Haldol):** Decreased effectiveness of the antipsychotic drug (Ford 519)

### Adverse Reactions

- **Can't see, can't pee, can't spit, can't sh\*\***
- Dry mouth, drowsiness, constipation or diarrhea, decreased production of tears, decreased sweating, gastrointestinal (GI) disturbances, dim vision, and urinary hesitancy
- Nausea and vomiting, nervousness, vertigo, headache, rash, and mental confusion (particularly in older adults)
- These drugs can also cause the urine to take on a dark brown color

### Nursing management

- **Flavoxate:** Take this drug three to four times daily as prescribed. This drug is used to treat symptoms; other drugs are given to treat the cause.
- **Oxybutynin:** Take this drug with or without food. Oxybutynin (Ditropan XL) contains an outer coating that may not disintegrate and sometimes may be observed in the stool. This is not a cause for concern. If using the transdermal form (patch) of the drug, be sure to apply to a clean, dry area of the hip, abdomen, or buttocks. Remove the old patch and rotate sites of new application every 7 days.
- Antispasmodic drugs can cause heat prostration (fever and heat stroke caused by decreased sweating) in high temperatures. If you live in hot climates or will be exposed to high temperatures, take appropriate precautions. (Ford 523)

Generic	Trade	Use	Dose
<b>Oxybutynin</b>	Ditropan	Overactive bladder, neurogenic bladder	5 mg orally BID or TID
<b>Solifenacin</b>	Vesicare	Overactive bladder	5 mg/day orally
<b>Trospium</b>	Sanctura	Overactive bladder	20 mg orally TID

# Urinary Oxybutynin & Tolterodine

## Drug name:

- Oxybutynin
- Tolterodine



## Indication:

- Overactive bladder
- Decreases urgency, frequency & nighttime bathroom visits (nocturia)



## Memory Trick:

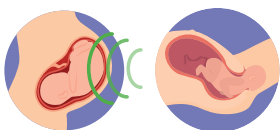
### Don't get tricked with sound

- **Oxy-Buty-nin** - B for Bladder  
Ox is on your Bladder! Given for urinary frequency



### Don't get tricked with sound alike drug names:

- **Oxy-codone** - is a opioid pain med  
Codone sounds like codeine  
Opioid pain med, or just look for the O's in cOdOne - O for opioid
- **Oxy-tocin** - is for labor  
To contract - given for contractions to induce labor



## MOA:

Anticholinergic to dry the body, think **anti-secretions** for anti-cholinergic



## Side Effects:

Dry body, avoid Glaucoma & BPH (all anticholinergics)

### ATI

- Blurred vision
- Dry eyes
- Avoid Glaucoma
- Dry mouth **NCLEX TIP**



### KEY POINTS

#### MAJOR ADVERSE EFFECT

##### 1. Urinary retention

**"No urination all day"**

**REPORT TO HCP! NCLEX TIP**

#### PATIENT TEACHING

2. **Slow position changes** - prevent Orthostatic hypotension
3. **Avoid hyperthermia** = too much sun exposure



## Common NCLEX Question

Which are expected side effects of oxybutynin?  
Select all that apply.

- ☐ 1. Hypertension.
- ☒ 2. Dry eyes.
- ☒ 3. Dry mouth.
- ☐ 4. Diarrhea.
- ☐ 5. Hypokalemia



## Notes

# Thrombolytics

## How do they work? "Action"

These drugs break down fibrin clots by converting plasminogen to plasmin. Plasmin is an enzyme that breaks down the fibrin of a blood clot. This reopens blood vessels after their occlusion and prevents tissue necrosis.

## Why do we give it? "Reason"

- Acute stroke or MI by lysis (breaking up) of blood clots in the coronary arteries
- Blood clots causing pulmonary emboli and DVT
- Suspected occlusions in central venous catheters (Ford 394)

## Adverse effects

- Bleeding

## Contraindications

- Active bleeding
- History of stroke
- History of aneurysm
- Recent intracranial surgery

## Nursing management

- **Must administer within 4-6 hours post thrombus formation**
- Assess the patient for bleeding every 15 minutes during the first 60 minutes of therapy, every 15 to 30 minutes for the next 8 hours, and at least every 4 hours until therapy is completed. Vital signs are monitored continuously. If pain is present, the primary health care provider may order an opioid analgesic. Once the clot dissolves and blood flows freely through the obstructed blood vessel, severe pain usually decreases. (Ford 396)
- **Lab Test Considerations:** Monitor activated partial thromboplastin time (aPTT) and hematocrit before and after and periodically. When intermittent IV therapy is used, draw aPTT levels 30 min before each dose during initial therapy and then periodically.
- **During continuous** administration, monitor aPTT levels every 4 hr during early therapy.

## Interactions:

- When a thrombolytic is administered with medications that prevent blood clots, such as aspirin, dipyridamole, or an anticoagulant, the patient is at increased risk for bleeding.

Generic	Trade	Use	Dose
Alteplase	Activase, Cathflo Activase (for IV catheter occlusions only)	Acute MI, acute ischemic stroke, PE, IV catheter clearance	Total dose of 90–100 mg IV, given as a 2- to 3-hr infusion

# Breast Cancer & Immunotherapy

## Drug name:

**Tamoxifen**



## KEY WORDS

- **Clots Risk!**
- **E - Estrogen**
- **E - Emboli** (clot risk)

### Contraindication:

History of **DVT** or **PE** CLARIFY order with provider!



## NCLEX Question

When preparing to administer **tamoxifen** to a patient with breast cancer, the nurse is most concerned by which patient report?

- ✓ A. "I have been experiencing really heavy menstrual cycles recently."
- B. "My hot flashes seem to be decreasing in frequency."
- C. "I feel like I may be developing a sinus infection."
- D. "I just don't have the energy for sex the way that I used to."

NORMAL

SIDE EFFECT



**DON'T GET TRICKED**

## HESI Question

**Tamoxifen** - Treats breast cancer



## KAPLAN

Endometrial cancer  
Report **"heavy periods"** "excessive **Bleeding**"



## Drug names:

**Filgrastim**  
**Pegfilgrastim**



## Indication:

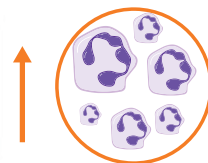
Stimulates WBC (neutrophil) production



WBC- neutrophil

## Key Point:

Expected = **INCREASE** neutrophil count



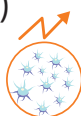
## Drug name:

**Oprelvekin**



## Indication:

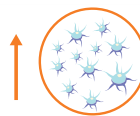
Increases platelet production, for patients in chemo who have high risk for thrombocytopenia (low platelet)



## ATI

### Patient Scenario:

- Stimulates growth of **hematopoietic** stem cells
- Oprelvekin effectiveness = **Increased platelets**



## HESI

### Adverse Effects

- **F**luid retention
- **A** fib
- **A**naphylaxis



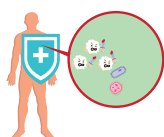
## Drug name:

**Interferon**



## Indication:

Stimulates the body's immune system to detect & kill cancer cells & viruses



## Side Effects:

Flu like symptoms:  
Fever, muscles aches, chills are **NORMAL**

## Memory Trick:

Inter**FLU**on



**NORMAL**

## HESI

### Interferon beta

- Apply warm compress **before** giving injection to reduce risk of pain at site
- Administer med late in the day so **flu like symptoms** occur during sleep

## Notes

# Calcium Channel Blockers

## How it works? "Action"

Systemic and coronary arteries are influenced by  $\text{Ca}^{++}$  moving across cell membranes. CCB act by inhibiting the movement of calcium across the cell membrane of cardiac and arterial muscles. Resulting in less calcium available for nerve impulse transmission and relax blood vessels to increase  $\text{O}_2$  supply to decrease cardiac workload

## Why do we give it? "Reason"

- Hypertension
- Angina pectoris
- Vasospastic (Prinzmetal's) angina

## Adverse effects

**CNS:** dizziness, fatigue.

**CV:** peripheral edema, angina, bradycardia, hypotension, palpitations.

**GI:** gingival hyperplasia, nausea.

**Derm:** flushing

## Contraindications

- Calcium channel blockers: sick sinus syndrome, 2nd/3rd degree atrioventricular block, ventricular dysfunction, cardiogenic shock.

## Nursing management

- Monitor BP and pulse frequently
- Monitor intake and output ratios and daily weight. Assess for signs of HF (peripheral edema, rales/crackles, dyspnea, weight gain, jugular venous distention).
- Angina: Assess location, duration, intensity, and precipitating factors of patient's anginal pain
- Avoid large amounts (6– 8 glasses of grapefruit juice/day)
- Have the client check pulse and report any sudden changes

## Interactions:

- **Cimetidine:** increase effects of CCB
- **Theophylline:** toxic effects of theophylline
- **Digoxin:** Dig toxicity
- **Rifampin:** decreased CCB effects

Generic	Trade	Safe Dose	Route
Amlodipine	Norvasc	5– 10 mg once daily	PO
Diltiazem	Cardizem	30– 120 mg 3– 4 times daily o	PO
Verapamil	Calan	80– 120 mg 3 times daily	PO, IV

# Bones

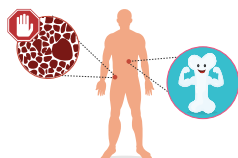
## Drug name:

**Calcium Carbonate**



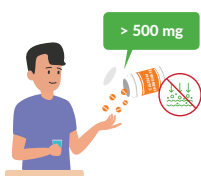
## Indication:

Osteoporosis & bone health to help make bones stronger

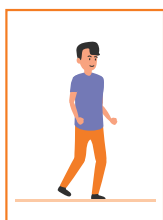
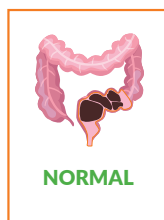


## KEY POINTS

- **TAKE IN DIVIDED DOSES-**  
Less than 500 mg
- Doses **OVER 500 mg**  
at one time are **NOT absorbed**
- **NO** need for frequent blood tests or routine labs



## COMMON SIDE EFFECT



- Constipation which is normal & to be expected.
- Just add fluids & ambulation

## MEMORY TRICK



Since calcium makes bones hard, just think Calcium makes bowels hard too!



- High CAL = Hard Bowel
- Low CAL = Loose Bowel

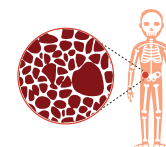
## Drug name:

End in “-dronate”  
**alendronate**  
**rise-dronate**



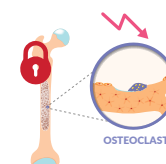
## Indication:

Osteoporosis



## MOA:

Inhibits bone reabsorption by reducing osteoclast activity, which breaks down the bone



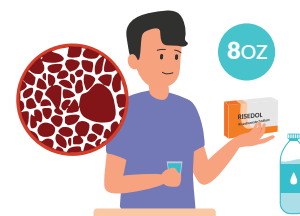
## KEY POINT

- Monitor bone density
- Take on Empty Stomach
- Esophagitis = Sit up  
**30 minutes** **NCLEX TIP**



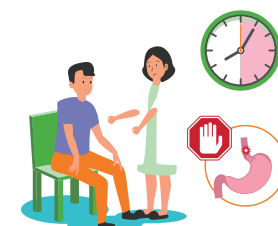
## HESI Question

- Treats Osteoporosis
- Drink full **8 oz** with medication



## KAPLAN Question

Teach patient to sit upright for at least **30 minutes**



## Notes

# Anticonvulsants

## - Misc

### How do they work? "Action"

**Miscellaneous drugs** have differing properties; for example, gabapentin is a GABA agonist, and topiramate blocks the seizure activity rather than raising the threshold.

### Indications

- Seizures of all types
- Neuropathic pain
- Bipolar disorders
- Anxiety disorders

### Adverse Reactions

- Nystagmus (constant, involuntary movement of the eyeball)
- Ataxia (loss of control of voluntary movements, especially gait)
- Slurred speech
- Gingival hyperplasia (overgrowth of gum tissue)

### Contraindications

All categories of anticonvulsants are contraindicated in patients with known hypersensitivity to the drugs. Carbamazepine should not be given within 14 days of monoamine oxidase inhibitor (MAOI) antidepressants. Carbamazepine is contraindicated in patients with bone marrow depression or hepatic or renal impairment and during pregnancy (pregnancy category D).

### Interactions

- **Antibiotics/antifungals:** Increased effect of the anticonvulsant
- **Tricyclic antidepressants:** Increased effect of the anticonvulsant
- **Salicylates:** Increased effect of the anticonvulsant
- **Cimetidine:** Increased effect of the anticonvulsant
- **Theophylline:** Decreased serum levels of the anticonvulsant
- **Antiseizure medications:** May increase seizure activity
- **Protease inhibitors:** Increased carbamazepine levels, resulting in toxicity
- **Oral contraceptives:** Decreased effectiveness of birth control, resulting in breakthrough bleeding or pregnancy
- **Analgesics or alcohol:** Increased depressant effect
- **Antidiabetic medications:** Increased blood glucose levels

### Fun Fact

- Research suggests an association between the use of anticonvulsants by pregnant women with epilepsy and an increased incidence of birth defects. The use of anticonvulsants is not discontinued in pregnant women with a history of major seizures because of the danger of precipitating status epilepticus. However, when seizure activity poses no serious threat to the pregnant woman, the primary health care provider may consider discontinuing use of the drug during pregnancy.
- Recurrence of seizure activity may result from abrupt discontinuation of the drug, even when the anticonvulsant is being administered in small daily doses
- Hematologic changes (e.g., aplastic anemia, leukopenia, and thrombocytopenia) need to be reported immediately. Teach the patient how to identify signs of thrombocytopenia (bleeding gums, easy bruising, increased menstrual bleeding, tarry stools) or leukopenia (sore throat, chills, swollen glands, excessive fatigue, or shortness of breath) and to contact the primary health care provider..

### Nursing management

- Do not omit, increase, or decrease the prescribed dose.
- Anticonvulsant blood levels must be monitored at regular intervals, even if the seizures are well controlled.
- This drug should never be abruptly discontinued, except when recommended by the primary health care provider.
- Do not attempt to put anything in the mouth of a person having a seizure.
- If the primary health care provider finds it necessary to stop the drug, another drug usually is prescribed. Start taking this drug immediately (at the time the next dose of the previously used drug was due).
- Anticonvulsant drugs may cause drowsiness or dizziness. Observe caution when performing hazardous tasks. Do not drive unless the adverse reactions of drowsiness, dizziness, or blurred vision are not significant. Driving privileges will be approved or reinstated by the primary health care provider based on seizure control.
- Avoid the use of alcohol unless use has been approved by the primary health care provider.
- Wear medical identification, such as a Medic Alert tag or bracelet, indicating drug use and the type of seizure disorder.

### Generic

### Trade

### Use

### Dose

**Carbamazepine**

Tegretol,  
Carbatrol,  
Epitol, Equetro

Epilepsy, bipolar disorder,  
trigeminal/postherpetic neuralgia

Maintenance: 800–1200 mg/day  
orally in divided doses

# Bipolar Meds

## Carbamazepine vs. Valproic Acid

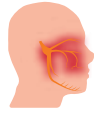
### Drug name:

**Carbamazepine**



### Indication:

- Bipolar & Seizures
- Trigeminal neuralgia (neuropathic pain)



### Side Effects:

- Leukopenia - LOW WBC
- Increased risk for BIG infection



### KEY WORD

Report fever / sore throat!!

### Accidental Pregnancy!!

- Oral contraceptives ineffective
- Will need alternative birth control methods



### Drug name:

**Valproic Acid**

### Side Effects & Memory Trick:

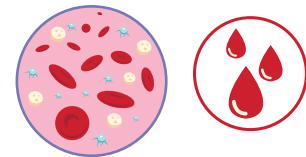
**VALLLLLLLL**

Think of L's for va**LL**proic Acid

- **L** - Liver toxic  
Jaundice & Liver labs (ALT & AST)



- **L** - Low Platelets  
AKA - Thrombocytopenia  
BIG bleed risk



Thrombocytopenia

**Not** Pregnancy Safe!  
Teach client not to discontinue abruptly



### Notes

# Neuromuscular Drugs

## - Dopaminergics

### How do they work? "Action"

Drugs that work to stimulate the dopamine receptors are called agonists. An example of this drug category includes bromocriptine. The action of amantadine is to make more of the dopamine available at the receptor site. Rasagiline (Azilect) and selegiline inhibit monoamine oxidase type B, again making more dopamine available. (Ford 282)

### Indications

- Parkinson's disease
- Parkinson-like symptoms (extrapyramidal) as a result of injury, drug therapy, or encephalitis
- Restless leg syndrome (RLS)
- Viral infections (amantadine) (Ford 282-283)

### Adverse Reactions

- Dry mouth and difficulty in swallowing
- Anorexia, nausea, and vomiting
- Abdominal pain and constipation
- Increased hand tremor
- Headache and dizziness (Ford 283)
- The most serious adverse reactions seen with levodopa include choreiform movements (involuntary muscular twitching of the limbs or facial muscles) and dystonic movements (muscular spasms most often affecting the tongue, jaw, eyes, and neck). (Ford 283)

### Contraindications

Levodopa is contraindicated in patients with narrow-angle glaucoma and those receiving MAOI antidepressants.

### Interactions

- **Tricyclic antidepressants:** Increased risk of hypertension and dyskinesia
- **Antacids:** Increased effect of levodopa
- **Anticonvulsants:** Decreased effect of levodopa
- Foods high in pyridoxine (vitamin B6) or vitamin B6 preparations reduce the effect of levodopa.

### Nursing management

- The patient should be screened for unusual skin lesions, because levodopa can activate malignant melanoma
- The dopamine agonists selegiline and rasagiline should not be used with the opioid meperidine (Demerol) because of antimetabolite conversion. Caution should be taken with any other opioid used with these antiparkinson drugs.
- Hallucinations occur more often in the older adult than in the younger adult receiving antiparkinson drugs. This is especially likely when taking dopamine receptor agonists.
- If dizziness, drowsiness, or blurred vision occurs, avoid driving or performing other tasks that require alertness.
- Avoid the use of alcohol unless use has been approved by the primary health care provider.
- Relieve dry mouth by sucking on hard candy (unless the patient has diabetes) or taking frequent sips of water. Consult a dentist if dryness of the mouth interferes with wearing, inserting, or removing dentures or causes other dental problems.
- Keep all appointments with the primary health care provider or clinic personnel because close monitoring of therapy is necessary.
- Ask your primary health care provider before buying vitamin supplements when taking levodopa. Vitamin B6 (pyridoxine) may interfere with the action of levodopa.

Generic	Trade	Dose	Use
Amantadine	N/A	Parkinson's disease/drug-induced extrapyramidal symptoms, prevention and treatment of infection with influenza A virus	200–400 mg/day orally in divided doses
Carbidopa/ Levodopa	Sinemet, Sinemet CR, Parcopa	Parkinson's disease	Begin with 10 mg/100 mg tablet orally TID, titrated dose combination to minimize symptoms

# Anti Infectives

## - Cephalosporins

### How do they work? "Action"

Cephalosporins have a  $\beta$ -lactam ring and target the bacterial cell wall, making it defective and unstable. This action is similar to the action of penicillin. The cephalosporins are usually bactericidal. (Ford 73)

### Indications

- Respiratory infections
- Otitis media (ear infection)
- Bone/joint infections
- Genitourinary tract and other infections caused by bacteria

### Adverse Reactions

- **Nephrotoxicity**
- **Malaise**
- **Steven johnson syndrome**
- Nausea
- Vomiting
- Diarrhea
- Headache
- Dizziness
- Heartburn
- Fever
- Aplastic anemia (deficient red blood cell production)
- Toxic epidermal necrolysis (death of the epidermal layer of the skin)

### Contraindications & Caution

- Do not administer cephalosporins if the patient has a history of allergies to cephalosporins.
- Cephalosporins should be used cautiously in patients with renal disease, hepatic impairment, bleeding disorder, pregnancy (pregnancy category B), and known penicillin allergy. (Ford 73)

### Interactions:

- Aminoglycosides: Increased risk for nephrotoxicity
- Oral anticoagulants: Increased risk for bleeding
- Loop diuretics: Increased cephalosporin blood level

### Nursing management

- Before administering any antibiotic be sure to evaluate the results of the culture and sensitivity test.
- Be sure to question the patient about allergy to penicillin or cephalosporins before administering the first dose, even when an accurate drug history has been taken
- After administering penicillin IM in the outpatient setting, ask the patient to wait in the area for at least 30 minutes. Anaphylactic reactions are most likely to occur within 30 minutes after injection.
- Take the drug at the prescribed time intervals.
- Complete the entire course of treatment. Do not stop the drug, except on the advice of a primary health care provider, before the course of treatment is completed, even if symptoms improve or disappear. Failure to complete the prescribed course of treatment may result in a return of the infection.
- Take drugs that must be taken on an empty stomach 1 hour before or 2 hours after a meal.
- Distinguish between immediate- and extended-release medications. Do not break, chew, or crush extended-release medications.

### Nursing Alert

- A patient who is allergic to penicillin also may be allergic to the cephalosporins.
- A disulfiram-like (Antabuse) reaction may occur if alcohol is consumed within 72 hours after administration of certain cephalosporins
- **Symptoms of a disulfiram-like reaction:** include flushing, throbbing in the head and neck, respiratory difficulty, vomiting, sweating, chest pain, and hypotension. Severe reactions may cause dysrhythmias and unconsciousness.
- People with phenylketonuria (PKU) need to be aware that the oral suspension cefprozil (Cefzil) contains phenylalanine, a substance that people with PKU cannot process.

### Generations Of Cephalosporins

- First generation—cephalexin (Keflex), cefazolin (Ancef)
- Second generation—cefaclor (Raniclor), cefoxitin (Mefoxin), cefuroxime (Zinacef)
- Third generation—cefoperazone (Cefobid), cefotaxime (Claforan), ceftriaxone (Rocephin)
- Fourth generation—cefepime (Maxipime)

Generic	Trade	Use	Dose
Cefadroxil	n/a	Infections due to susceptible microorganisms,	1–2 g/day orally in divided doses
Cefoxitin	Mefoxin	Infections due to susceptible microorganisms, perioperative prophylaxis	250 mg orally q 8 hr

# Chemotherapy

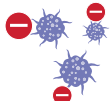
## Drug names:

- Doxorubicin
- Cisplatin
- Cyclophosphamide



## Indication:

Slow & stop the growth of tumors



## MOA:

Directly inhibiting growing cells in the body



## Adverse Effects:

All fast growing cells die

- Bone cells **DIE**
- Blood cells **DIE**
- **Low** immunity



## KEY WORDS

- "Immunodeficiency"
- "Immune compromised"
- **FEVER** is a priority **OVER 100.3 F (38 C)!!!**

NCLEX TIP



## Key Points:

- **Low RBC & LOW CBC - "Anemia"**
  - Normal: 4.5 - 6 million RBC
- **Low Platelets**
  - Normal plt 150 - 400,000
  - Less than 100,000 = **Thrombocytopenia**
- **Low WBC - leukopenia < 4,000**
  - Normal: 5,000 - 10,000



## KAPLAN

**Doxorubicin- Temperature** is highest priority Over 100.5 F (38 C)

## Cisplatin:

### KEY POINT

### Renal toxicity

Monitor Urine- Input & Output

- Creatinine **OVER 1.3 = Bad kidney**
- BUN **OVER 20**
- Urine output **30ml/hr** or LESS = **Kidney Distress**

Creatinine > 1.3



BUN > 20



Urine Output < 30ml/hr



## MEMORY TRICK

CISplatin



PISSplatin



## Drug name:

**Vincristine**



Only chemo drug that does NOT cause bone marrow suppression!

## Memory Trick:

Very Cool **CHRISTIAN**

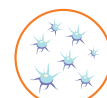
Just a gentle Sainly soul, does not harm the bone marrow



## Common NCLEX Question

The nurse is caring for a client with ovarian cancer taking **doxorubicin**, which assessment finding should the nurse report to the health care provider? **Select All That Apply**

- ☐ 1. Partial thromboplastin time 55.
- ☒ 2. Platelet count of 48,000.
- ☐ 3. Red blood cell count  $5 \times 10^6$ .
- ☒ 4. Temperature of 100.7 (38.2 C).
- ☒ 5. White blood cells 3,600.



< 50,000

Normal 150,000 - 400,000



> 100.3 F / 38°C



< 4,000

Normal 5,000 - 10,000

## Notes

# Cholesterol Lowering Agents

## Drug name:

### "-statin"

- Atorva**statin**
- Simva**statin**
- Lov**astatin**
- Rosuva**statin**

## Memory Trick:

S

S - Statin  
S - Stay Clean



S

S - Statin  
S - Smooth Tin Can  
"StaaaTIN"



## Caution



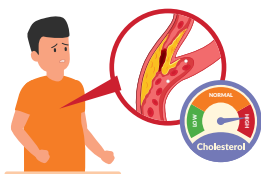
NOT Nystatin – that's an antifungal medicine for treating YEAST infections

## Indication:

### High cholesterol levels

- Hyper**cholesterolemia**
- Hyper**lipidemia**

(Different names for the same thing)



## MOA:

It does this by preventing cholesterol production in the liver. Technically by preventing an enzyme the LIVER needs to make the cholesterol!

### Bad

- Total Cholesterol **200**
- Triglycerides **150**
- LDL "Loser Lipids" **100**



### Good

- HDL "HIGH Lipids" **40**



## KEY POINTS

## STAT

"MUSCLE CRAMPS"  
"MUSCLE spasms"  
"MUSCLE ACHES"

S

Sore MUSCLES

T

Toxic Liver (ALT & AST)

A

AVOID Grapefruit & St Johns Wart

T

Take at NIGHT **NCLEX Term**  
"Take at **dinner time** or **bed-time**"

## ATI Question

"Patient on Lovastatin, when would the nurse notify the HCP?"

**Answer: Muscle aches & cramps**

## Kaplan Question

"Report new muscle tenderness to the HCP"

## HESI Question

"Report muscle pain & Tenderness without Injury"

**Answer: Rosuvastatin**

## Notes

# PNS Drugs

## - Cholinergics

### How do they work? "Action"

- Cholinergic drugs that act like the neurotransmitter ACh are called direct-acting cholinergics. Cholinergic drugs causes contraction of the bladder smooth muscles and passage of urine. (Ford 266)
- Cholinergic drugs that prolong the activity of ACh by inhibiting the release of AChE are called indirect-acting cholinergics or anticholinesterase muscle stimulants.

### Indications

- Urinary retention
- Myasthenia gravis

### Adverse Reactions

- Nausea, diarrhea, abdominal cramping
- Salivation
- Flushing of the skin
- Cardiac arrhythmias and muscle weakness

### Contraindications

Hypersensitivity to the drugs, asthma, peptic ulcer disease, coronary artery disease, and hyperthyroidism. Bethanechol is contraindicated in those with mechanical obstruction of the GI or genitourinary tracts. Patients with secondary glaucoma, iritis, corneal abrasion, or any acute inflammatory disease of the eye should not use the ophthalmic cholinergic preparations. (Ford 267)

### Interactions

- **Aminoglycoside:** Anti-infective agent  
Increased neuromuscular blocking effect
- **Corticosteroids:** Decreased effect of the cholinergic drug

### Nursing Alert

Cholinergic crisis (cholinergic drug toxicity) symptoms include severe abdominal cramping, diarrhea, excessive salivation, muscle weakness, rigidity and spasm, and clenching of the jaw. Patients exhibiting these symptoms require immediate medical treatment. In the case of drug overdose, an antidote such as atropine (0.4 to 0.6 mg intravenously [IV]) is administered. (Ford 267)

### Nursing management

Because of the need to make frequent dosage adjustments, observe the patient closely for symptoms of drug overdose or underdose. Signs of drug overdose include muscle rigidity and spasm, salivation, and clenching of the jaw. Signs of drug underdosage are signs of the disease itself, namely, rapid fatigability of the muscles, drooping of the eyelids, and difficulty breathing. If symptoms of drug overdose or underdose develop, contact the primary health care provider immediately.

Generic	Trade	Use	Dose
<b>Bethanechol</b>	Duvoid, Urecholine	Acute non obstructive urinary retention, neurogenic atony of urinary bladder with urinary retention	10–50 mg orally BID to QID; 2.5–5 mg subcutaneously TID to QID
<b>Ambenonium</b>	Mytelase	Myasthenia gravis	5–75 mg orally TID, QID

# Cholinergics

## Neostigmine, Pyridostigmine

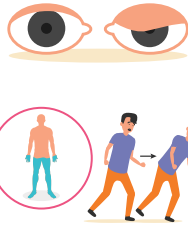
### Drug name:

Neostigmine  
Pyridostigmine



### Indication:

- MG - Myasthenia Gravis
- Dry body & lack of mobility



### MOA:

Helps lube up the body with secretions by increasing acetylcholine



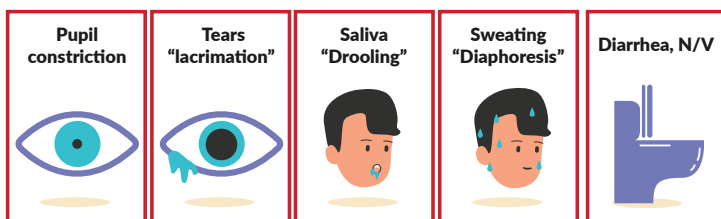
### Memory Trick:

**"-stigmine"**  
Secretions MINE



### Adverse Effects:

**CCCholinergic Crisis**  
is a Se**CC**retion crisis!



### Antidote:

Atropine (**Anti**cholinergic)

- Ending in Tropine
- NO pee with tropine

Dry body



### HESI Question

Anticipate drug to treat myasthenia gravis?

- Neostigmine

Patient being managed for **myasthenic crisis** develops asthma:

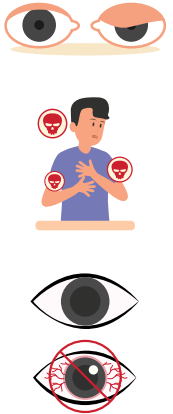
- Discontinue **Pyridostigmine**

Patient with anticholinergic toxicity

- **Physostigmine**

Med Effectiveness: "-Stigmine"

- Absence of **muscle cramps** and adequate vision without **diplopia**



### ATI Question

- Pupil constriction
- Difficulty with visual accommodation
- Atropine given for **cholinergic crisis caused by** excess amount of **neostigmine**



### KAPLAN Question

Client on **pyridostigmine** having salivation, lacrimation, and urination - notify the HCP



Notes

# PNS Drugs - Cholinergics

79

## HOW DO THEY WORK?

### "ACTION"

- ❖ Cholinergic drugs that act like the neurotransmitter ACh are called direct-acting cholinergics. cholinergic drugs causes contraction of the bladder smooth muscles and passage of urine. (Ford 266)
- ❖ Cholinergic drugs that prolong the activity of ACh by inhibiting the release of AChE are called indirect-acting cholinergics or anticholinesterase muscle stimulants.

### INDICATIONS

- ❖ Urinary retention
- ❖ Myasthenia gravis

## ADVERSE REACTIONS

- ❖ Nausea, diarrhea, abdominal cramping
- ❖ Salivation
- ❖ Flushing of the skin
- ❖ Cardiac arrhythmias and muscle weakness

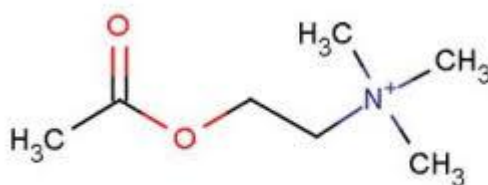


## CONTRAINDICATIONS

Hypersensitivity to the drugs, asthma, peptic ulcer disease, coronary artery disease, and hyperthyroidism. Bethanechol is contraindicated in those with mechanical obstruction of the GI or genitourinary tracts. Patients with secondary glaucoma, iritis, corneal abrasion, or any acute inflammatory disease of the eye should not use the ophthalmic cholinergic preparations. (Ford 267)

## INTERACTIONS

- ❖ **Aminoglycoside:** Anti-infective agent Increased neuromuscular blocking effect
- ❖ **Corticosteroids:** Decreased effect of the cholinergic drug



Acetylcholine

## NURSING ALERT

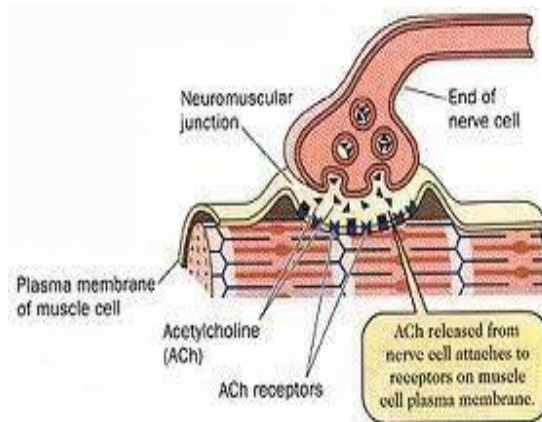
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## Myasthenia Gravis



## NURSING MANAGEMENT

Because of the need to make frequent dosage adjustments, observe the patient closely for symptoms of drug overdose or underdose. Signs of drug overdose include muscle rigidity and spasm, salivation, and clenching of the jaw. Signs of drug underdosage are signs of the disease itself, namely, rapid fatigability of the muscles, drooping of the eyelids, and difficulty breathing. If symptoms of drug overdose or underdose develop, contact the primary health care provider immediately.



### CHOLINERGIC CRISIS

**S**alivation  
**L**acrimation  
**U**rination  
**D**efecation



Generic	Trade	Use	Dose
bethanechol	Duvoid, Urecholine	Acute non obstructive urinary retention, neurogenic atony of urinary bladder with urinary retention	10–50 mg orally BID to QID; 2.5–5 mg subcutaneously TID to QID
ambenonium	Mytelase	Myasthenia gravis	5–75 mg orally TID, QID

# CNS Drugs

## - Cholinesterase Inhibitors

### How do they work? "Action"

The cholinesterase inhibitors act to increase the level of acetylcholine in the central nervous system (CNS) by inhibiting its breakdown and slowing neural destruction. (Ford 197)

### Indications

Cholinesterase inhibitors are used to treat early and moderate stages of dementia associated with AD. Their use for severe cognitive decline as well as other dementias, such as vascular or Parkinson's dementia, is being studied. (Ford 198)

### Adverse Reactions

- Anorexia, nausea, vomiting, diarrhea
- Dizziness and headache

### Interactions

- **Anticholinergics:** Decreased effectiveness of anticholinergics
- **Nonsteroidal anti-inflammatory drugs:** Increased risk of GI bleeding
- **Theophylline:** Increased risk of theophylline toxicity

### Nursing management

- Should cholinesterase inhibitor therapy be discontinued, individuals lose any benefit they have received from the drugs within 6 weeks.
- Keep all appointments with the primary care provider or clinic, because close monitoring of therapy is essential. Dose changes may be needed to achieve the best results.
- Report any unusual changes or physical effects to the primary health care provider.
- Take the drug exactly as directed. Do not increase, decrease, or omit a dose or discontinue use of this drug unless directed to do so by the primary health care provider.
- Do not drive or perform other hazardous tasks if drowsiness occurs. Discuss with your primary health care provider when patients should be evaluated for their continued ability to drive.
- Do not take any nonprescription drug before talking to your primary health care provider.
- Keep track of when the drug is taken. Marking the calendar, cell phone alarms, or a pill counter that holds the medicine for each day of the week may be helpful tools to remind the patient to take the medication or determine whether the medication has been taken for the day.
- Notify the primary care provider if the following adverse reactions are experienced for more than a few days: nausea, diarrhea, difficulty sleeping, vomiting, or loss of appetite.
- Immediately report the occurrence of the following adverse reactions: severe vomiting, dehydration, or changes in neurologic functioning.
- Notify the primary health care provider if the patient has a history of ulcers, feels faint, experiences severe stomach pains, vomits blood or material that resembles coffee grounds, or has bloody or black stools.
- Remember that these drugs do not cure AD but slow the mental and physical degeneration associated with the disease. The drug must be taken routinely to slow the progression.

### Herbal Consideration

Ginkgo, one of the oldest herbs in the world, has many beneficial effects. It is thought to improve memory and brain function and enhance circulation to the brain, heart, limbs, and eyes. However, research is inconclusive as to whether or not this is true. Ginkgo is contraindicated in patients taking selective serotonin reuptake inhibitor (SSRI) or monoamine oxidase inhibitor (MAOI) antidepressants because of the risk of a toxic reaction.

Dementia Vs. Delirium	Delirium	Dementia
<b>Onset</b>	Sudden change	Progressive change
<b>Presentation</b>	Affects senses	Affects memory and judgment
<b>Reversibility</b>	Yes, when cause such as oxygen or chemical imbalances or infections found and treated	No, can slow progression with drugs, need to change environment for patient to remain safe

Generic	Trade	Use	Dose
<b>Donepezil</b>	Aricept	Mild to severe dementia due to AD, memory improvement in dementia due to stroke, vascular disease, multiple sclerosis	5–10 mg/day orally
<b>Galantamine</b>	Razadyne	Mild to moderate (AD) dementia	16–24 mg BID orally

# CNS Drugs

## Central Acting Antiadrenergics

### How do they work? "Action"

Acts on the central nervous system (CNS) rather than on the peripheral nervous system. This group affects specific CNS centers, thereby decreasing some of the activity of the sympathetic nervous system. (Ford 256)

### Indications

- Hypertension
- BPH

### Adverse Reactions

- Dry mouth, drowsiness, sedation, anorexia, rash, malaise, and weakness are generalized reactions to antiadrenergic drugs that work on the CNS.
- Hypotension, weakness, lightheadedness, and bradycardia are adverse reactions associated with the administration of peripherally acting antiadrenergic drugs. (Ford 257)

### Contraindications

Centrally acting antiadrenergic drugs are contraindicated in active hepatic disease, in antidepressant therapy using MAOIs, and in patients with a history of hypersensitivity to these drugs. (Ford 257)

### Interactions

- **Adrenergic drugs:** Increased risk of hypertension
- **Levodopa:** Decreased effect of the levodopa, hypotension
- **Anesthetic agents:** Increased effect of the anesthetic
- **$\beta$  blockers:** Increased risk of hypertension
- **Lithium:** Increased risk of lithium toxicity
- **Haloperidol:** Increased risk of psychotic behavior

### Nursing Alert

If a significant decrease in blood pressure (a drop of 20 mm Hg systolic or a systolic pressure below 90 mm Hg) occurs after a dose of an adrenergic blocking drug, withhold the next drug dose and notify the primary health care provider immediately. A dosage reduction or discontinuation of the drug may be necessary. Some adrenergic blocking drugs (e.g., prazosin or terazosin) may cause a first-dose effect. A first-dose effect occurs when the patient experiences marked hypotension (or postural hypotension) and syncope with sudden loss of consciousness with the first few doses of the drug. (Ford 259)

### Nursing management

- Do not stop taking the drug abruptly, except on the advice of the primary health care provider. Most of these drugs require that the dosage be gradually decreased to prevent precipitation or worsening of adverse effects.
- Notify the primary health care provider promptly if adverse drug reactions occur.
- Observe caution while driving or performing other hazardous tasks because these drugs ( $\beta$ -adrenergic blockers) may cause drowsiness, dizziness, or lightheadedness.
- Immediately report any signs of HF (weight gain, difficulty breathing, or edema of the extremities).
- Do not use any nonprescription drug (e.g., cold or flu preparations or nasal decongestants) unless you have discussed use of a specific drug with the primary health care provider.
- Inform dentists and other primary health care providers of therapy with this drug.
- Keep all primary health care provider appointments because close monitoring of therapy is essential.
- Check with a primary health care provider or clinical pharmacist to determine if the drug is to be taken with food or on an empty stomach. (Ford 259-260)

Generic	Trade	Use	Dose
Clonidine	Catapres, Catapres-TTS (transdermal)	Hypertension, severe pain in patients with cancer	100–600 mcg/day orally Transdermal: release rate 0.1–0.3 mg/24 hr
Methyldopa	N/A	Hypertension, hypertensive crisis	250 mg orally BID or TID; maintenance dose: 2 g/day; 250–500 mg q 6 hr IV

# Antihypertensive Clonidine

## Cardiac Pharmacology

### Indication

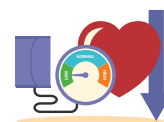


Very strong blood pressure lowering drug! Used last if high blood pressure is not responsive to other meds.

### MEMORY TRICK

Clonidine

Cardiac **DOWN**



### NCLEX TIP

Don't get tricked with sound alike drug names!

**Clonidine is not** Famotidine or Clozapine.

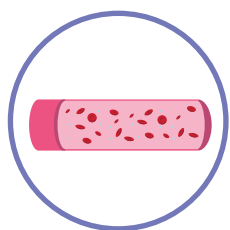
- Famotidine (H2 blocker for acid reflux)
- Clo-zapine (antipsychotic med)

### Caution

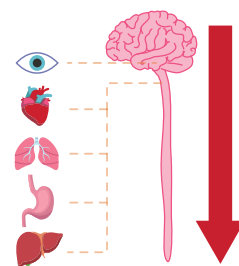
Don't get tricked!



### Mech Action



It decreases the heart rate, cardiac output, & blood pressure. In fancier terms, it is an **Alpha 2 agonist** & decreases the sympathetic response from the central nervous system (CNS) resulting in decreased peripheral vascular resistance and vasodilation.



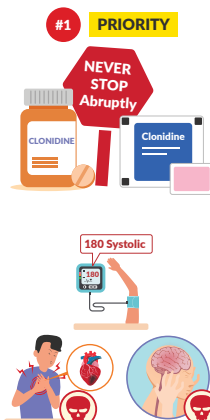
### Patient Teaching

#### Key point

PRIORITY Teaching:

#### NCLEX TIP

1. Do **NOT** stop taking "**Abruptly**"
2. **Slowly** taper off over 2 - 4 days
3. Teach **Slow** position changes



### MEMORY TRICK

If BP is **Low** = Got to go **SLOW**



### HESI Question

Clonidine

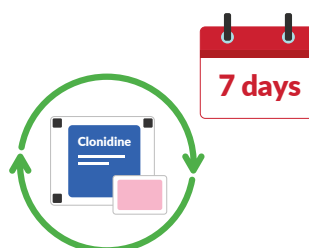
- Do **NOT** stop taking abruptly!
- Selectively activates alpha 2 receptors in CNS



### Kaplan Question

Clonidine Patch...

- Change the patch **every 7 days**



# Neuromuscular Drugs

## - Compt Receptor

### How do they work? "Action"

Thought to prolong the effect of levodopa by blocking an enzyme, COMT, which eliminates dopamine. When given with levodopa, the COMT inhibitors increase the plasma concentrations and duration of action of levodopa.

### Indications

Used as adjuncts to levodopa/carbidopa in treating Parkinson's disease. Entacapone is a mild COMT inhibitor and is used to help manage fluctuations in the response to levodopa in individuals with Parkinson's disease. Tolcapone is a potent COMT inhibitor that easily crosses the blood-brain barrier. However, the drug is associated with liver damage and liver failure. Because of the danger to the liver, tolcapone is reserved for people who are not responding to other therapies.

### Adverse Reactions

- Dizziness
- Dyskinesias, hyperkinesia, akathisia
- Nausea, anorexia, and diarrhea
- Orthostatic hypotension, sleep disorders, excessive dreaming
- Somnolence and muscle cramps

### Interactions

- **MAOI antidepressants:**
- Increased risk of toxicity of both drugs
- **Adrenergic drugs:** Increased risk of cardiac symptoms

### Contraindications

These drugs are contraindicated in patients with hypersensitivity to the drugs and during pregnancy and lactation (pregnancy category C). Tolcapone is contraindicated in patients with liver dysfunction. The COMT inhibitors are used with caution in patients with hypertension, hypotension, and decreased hepatic or renal function.

### Nursing management

- If dizziness, drowsiness, or blurred vision occurs, avoid driving or performing other tasks that require alertness.
- Avoid the use of alcohol unless use has been approved by the primary health care provider.
- Relieve dry mouth by sucking on hard candy (unless the patient has diabetes) or taking frequent sips of water. Consult a dentist if dryness of the mouth interferes with wearing, inserting, or removing dentures or causes other dental problems.
- Keep all appointments with the primary health care provider or clinic personnel because close monitoring of therapy is necessary.
- Ask your primary health care provider before buying vitamin supplements when taking levodopa. Vitamin B6 (pyridoxine) may interfere with the action of levodopa.

Generic	Trade	Dose	Use
Entacapone	Comtan	As adjunct to levodopa/carbidopa in Parkinson's disease	200–1600 mg/day orally
Tolcapone	Tasmar	Parkinson's disease when refractory to levodopa/carbidopa	100–200 mg orally TID

# Contraception

## Drug names:

### Estrogen & Progesterone

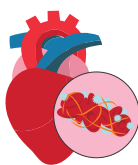


#### Major Adverse Effects

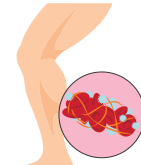
- Increased risk for blood clots!

That's why it's not given to patients with:

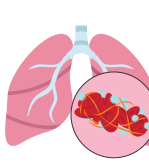
#### MI



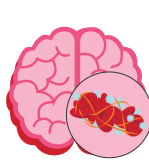
#### DVT



#### PE



#### CVA stroke



### KEY POINTS

#### Patient teaching:

- DO NOT** smoke! **HESI**
- REPORT:**
  - Severe leg pain, swelling, vision loss (Could be DVT/ CVA)

### Memory Trick

**E** - **Estro**gen & **Progeste**rone

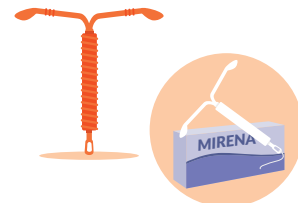
**E** - Emboli



## Drug names:

### 2 types

- Copper Intrauterine Device
- Levonorgestrel



## KEY POINTS

### Copper Intrauterine Device

- Mild discomfort upon insertion (spotting/ **cramping**)
- Heavier **bleeding** and **increased cramping** during menses

### Both IUDs **TEACH:**

- Check strings MONTHLY** after menses to ensure IUD still in place
- Longer, shorter, missing string = **REPORT to the HCP**

## HESI Question

- Estrogen** & Smoking = increases risk for blood clots
- Estrogen** = **contraindication** for a patient with **Thrombophlebitis**

## KAPLAN Question

Priority finding:  
Client taking **estrogen** with report of **left leg pain** behind the knee = **possible DVT**

## ATI Question

- Do not take with **carbamazepine**... makes oral contraceptives ineffective

## QUESTION BANK

Medroxy**progEstero**ne acetate  
Instruct client that ovulation may not occur for a few months after using this med.



Don't let

### NCLEX TRICK YOU



Missed periods randomly - **NOT** normal  
- **COULD MEAN PREGNANCY!**



- IUDs are **NOT** affected by lubricants
- NOT** affected by weight gain or loss

## Notes

# Contraceptives

## How do they work? "Action"

Most contraceptives are formed from estrogen and progesterone. These two hormones act together to block the release of an egg during ovulation, thus preventing pregnancy.

## Indications

- Regulation of menstrual cycle
- Prevention of unintended pregnancy
- Decrease menstrual bleeding
- Decreasing the risk of iron deficits during menstruation
- Decrease risk of ovarian cysts
- Decrease in fibrocystic breast disease
- Decrease in pelvic inflammatory disease
- Decrease risk of endometrial cancer
- Decrease risk of cervical cancer
- Decrease in acne

## Adverse Reactions

### Estrogen

- **Excess:** Nausea, bloating, cervical mucorrhea (increased cervical discharge), polyposis (numerous polyps), hypertension, migraine headache, breast fullness or tenderness, edema
- **Deficit:** Early or mid cycle breakthrough bleeding, increased spotting, hypomenorrhea, melasma (discoloration of the skin)

### Progestin

- **Excess:** Increased appetite, weight gain, tiredness, fatigue, hypomenorrhea, acne, oily scalp, hair loss, hirsutism (excessive growth of hair), depression, monilial vaginitis, breast regression
- **Deficit:** Late breakthrough bleeding, amenorrhea, hypomenorrhea

## Contraindications

The warnings associated with the use of oral contraceptives, notably the combined drug contraceptives, are the same as those for the estrogens and progestins and include cigarette smoking (especially those older than 35 years of age), which increases the risk of cardiovascular side effects, such as venous and arterial thromboembolism, myocardial infarction, and thrombotic and hemorrhagic stroke. Also reported with oral contraceptive use are hepatic adenomas and other tumors, visual disturbances, gallbladder disease, hypertension, and fetal abnormalities. (Ford 497)

## Interactions

- **Oral anticoagulants:** Decreased anticoagulant effect
- **Tricyclic antidepressants:** Increased effectiveness of antidepressant
- **Rifampin:** Increased risk of breakthrough bleeding
- **Hydantoins:** Increased risk of breakthrough bleeding and pregnancy

## Critical Thinking

- If the interval is greater than 14 weeks between the IM injections of medroxyprogesterone, be certain that the patient is not pregnant before administering the next injection. (Ford 498)
- There is an increased risk of postoperative thromboembolic complications in women taking oral contraceptives. If possible, use of the drug is discontinued at least 4 weeks before a surgical procedure associated with thromboembolism or during prolonged immobilization. (Ford 498)

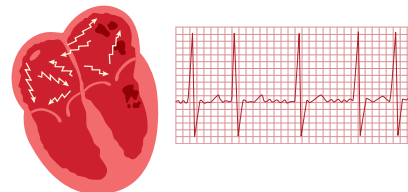
## Nursing management

- Assess likelihood of current pregnancy
- Administer pregnancy test
- Document the patient's sexual history and reason for contraception.
- Evaluate the patient's understanding of safe sexual practices and understanding that hormonal contraceptives do not protect against sexually transmitted infections (STIs).
- Inquire about a history of thrombophlebitis or other vascular disorders, a smoking history, and a history of liver diseases. Assess Blood pressure, pulse, and respiratory rate
- **Monophasic oral contraceptives** are administered on a 21-day regimen, with the first tablet taken on the first Sunday after the menses begin or on the day the menses begin if the menses begin on Sunday. After the 21-day regimen, the next 7 days are skipped,
- **Levonorgestrel**, a progestin, is available as an implant contraceptive system (Norplant System). Six capsules, each containing levonorgestrel, are implanted using local anesthesia in the subdermal (below the skin) tissues of the midportion of the upper arm. The capsules provide contraceptive protection for 5 years but may be removed at any time at the request of the patient.
- **Medroxyprogesterone (Depo-Provera)**, a synthetic progestin used in the treatment of abnormal uterine bleeding and secondary amenorrhea, is also used as a contraceptive. This drug is given IM every 3 months, and the initial dosage is given within the first 5 days of menstruation or within 5 days postpartum. (Ford 498)

# Dabigatran & Argatroban

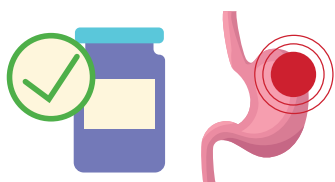
## Indication:

Used to prevent clot in high risk **A Fib** patients



## KEY POINTS

- **DO NOT STOP THE MED FOR GI ISSUES**
- **STOP** med if **black tarry STOOLS**
- **NOT** Stores IN PILL BOX ... in original container!!!
- **NOT** crushed, taken whole
  - Memory Trick** = Take DA BIG pill whole!
    - HOLD clopidogrel
    - HOLD before surgery



## ATI QUESTION

- Meds to Hold before Surgery → Dabigatran



## HESI QUESTION

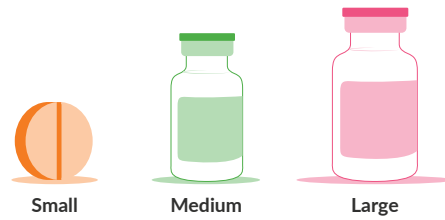
- Pt on Dabigatran → Do not take with **clopidogrel**



Notes

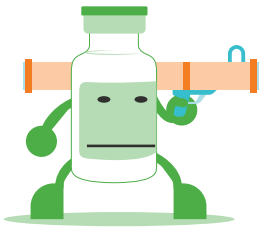
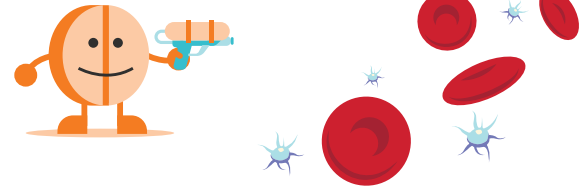
# Blood Thinners

Generally comes in 3 sizes:  
Small, Medium, LARGE



By comparison think of:

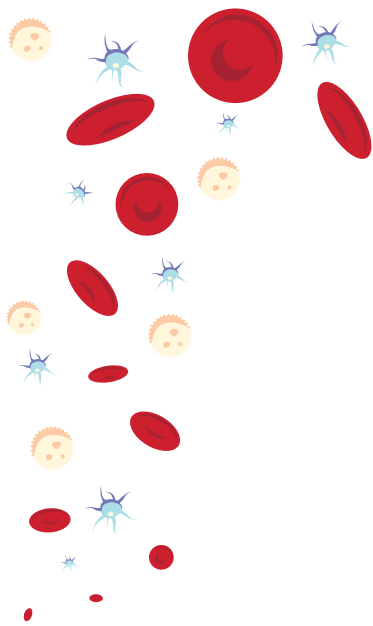
**Antiplatelets** like **Aspirin & Clopidogrel**  
like a water gun - those are small ones



**Anticoagulants - Heparin & Warfarin,**  
like bazooka - those are the medium

**Thrombolytic Clot busters - TPA & Alteplase**  
like an ATOMIC BOMB.

Those are large ones and MOST deadly,  
since THEY HAVE the **HIGHEST BLEED RISK!**



Notes

# Cardiotonic Drugs

## How it works? "Action"

Cardiotonics such as digoxin increase cardiac output through positive inotropic activity (an increase in the force of the contraction). They slow the conduction velocity through the atrioventricular (AV) node in the heart and decrease the heart rate through a negative chronotropic effect.

**Milrinone** has inotropic action and is used in the short-term management of severe heart failure that is not controlled by the digitalis preparation. (Ford 403)

## Why do we give it? "Reason"

- Heart failure
- Atrial fibrillation

## Contraindications

- Digitalis toxicity
- known hypersensitivity
- ventricular failure, ventricular tachycardia, cardiac tamponade, restrictive cardiomyopathy, or AV block. (Ford 404)

## Digoxin toxicity & electrolyte imbalances

- Plasma digoxin levels are monitored closely. Blood for plasma level measurements should be drawn immediately before the next dose or 6 to 8 hours after the last dose regardless of route. Therapeutic drug levels are between 0.8 and 2 nanograms/mL. Plasma digoxin levels greater than 2 nanograms/mL are considered toxic and are reported to the primary health care provider. Hypokalemia makes the heart muscle more sensitive to digitalis, thereby increasing the possibility of developing digitalis toxicity. At frequent intervals, observe patients with hypokalemia closely for signs of digitalis toxicity. (Ford 405)

## Nursing management

**The physical assessment should include the following:**

- Taking blood pressure, apical-radial pulse rate, respiratory rate
- Auscultating the lungs, noting any unusual sounds during inspiration and expiration
- Examining the extremities for edema
- Checking the jugular veins for distention
- Measuring weight
- Inspecting sputum raised (if any) and noting the appearance (e.g., frothy, pink tinged, clear, yellow)
- Looking for evidence of other problems such as cyanosis, shortness of breath on exertion (if the patient is allowed out of bed) or when lying flat, and mental changes (Ford 405)
- Pediatric
- The drug is withheld and the primary health care provider notified before administration of the drug if the apical pulse rate in a child is below 70 bpm, or below 90 bpm in an infant.
- Daily weights

## Interactions:

- **Thyroid hormone:** Decreased effects of digoxin
- **Thiazide and loop diuretics:** Increased diuretic electrolyte disturbances, especially hypokalemia

## Adverse effects

- Headache
- Weakness, drowsiness
- Visual disturbances (blurring or yellow halo)
- Arrhythmias
- Nausea and anorexia

Generic	Trade	Use	Route
Digoxin	Lanoxin	Heart failure, atrial fibrillation	Loading dose:* 0.75–1.25 mg orally or 0.6–1 mg IV Maintenance: 0.125–0.25 mg/day orally Lanoxicaps: 0.1–0.3 mg/day orally
Milrinone.	Short-term management of heart failure	Short-term management of heart failure	Loading dose: 50 mcg/kg IV IV: Up to 1.13 mg/kg/day

# Diuretics

## - Carbonic Anhydrase Inhibitors

### How it works? "Action"

- Diuretics work by altering the reabsorption or excretion of electrolytes and alter fluid volume.

Carbonic anhydrase inhibitors: sulfonamides without bacteriostatic action, inhibit CAH enzyme thus results in excretion of  $\text{Na}^+$   $\text{K}^+$   $\text{HCO}_3^-$  and  $\text{H}_2\text{O}$

### Why do we give it? "Reason"

- Hypertension
- Used with antihypertensives
- To reduce edema
- Glaucoma
- Seizures
- Renal disease.

### Adverse effects

**Neuro:** Dizziness, headache, encephalopathy, lightheadedness, weakness, fatigue

**EENT:** Hearing loss, tinnitus

**CV:** Orthostatic hypotension

**GU:** Electrolyte imbalances, glycosuria

**GI:** Anorexia, nausea, vomiting

**Derm:** Rash, photosensitivity

**Endo:** Hyperglycemia, hyperuricemia.

**F & E:** Dehydration, hypocalcemia, hypochloremia, hypokalemia, hypomagnesemia, hyponatremia, hypokalemia, metabolic alkalosis

**MS:** Arthralgia, muscle cramps, myalgia.

### Nursing management

- Monitor BP and pulse frequently
- Assess for allergy to sulfonamides
- Monitor intake and output ratios and daily weight.
- Do not stop the drugs abruptly unless you speak with the DR.
- If GI upset occurs then take the med with food or milk
- Take early in the morning
- Do not reduce fluid intake
- Avoid alcohol and non prescription drugs
- Notify the healthcare provider if: muscle cramps, weakness, dizziness, diarrhea, restlessness, excessive thirst, general weakness, rapid pulse, increased heart rate or pulse, gi distress.
- Weight yourself daily.
- These drugs may cause hypokalemia, monitor serum potassium levels and electrolytes.

### Interactions:

- **Primidone:** decreased effectiveness of primidone
- **Barbiturates & aspirin:** decrease diuretic effectiveness
- **tricyclic antidepressants:** can lead to toxicity

### Contraindications

- Hypersensitivity
- Electrolyte imbalances
- Severe kidney or liver dysfunction
- Anuria.
- **Mannitol:** active intracranial bleeding except during craniotomy

### Simple Nursing Brain bits

If a client has an allergy to sulfonamides this drug should not be given.

Generic	Trade	Safe Dose	Route
Acetazolamide	Diamox	250– 1000 mg/day in 1– 4 divided doses	PO
Methazolamide	Neptazane	50– 100 mg 2– 3 times daily.	PO

# Diuretics

## - Loop Diuretics

### How it works? "Action"

- Diuretics work by altering the reabsorption or excretion of electrolytes and alter fluid volume.

**Loop diuretics:** inhibit the reabsorption of sodium chloride in the proximal and distal convoluted tubules and the loop of henle. This site increase their effectiveness .

### Why do we give it? "Reason"

- Hypertension
- Used with antihypertensives
- To reduce edema
- Glaucoma
- Seizures
- Renal disease.

### Adverse effects

**Neuro:** Dizziness, headache, encephalopathy, lightheadedness, weakness, fatigue

**EENT:** Hearing loss, tinnitus

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**MS:** Arthralgia, muscle cramps, myalgia.

### Contraindications

- Hypersensitivity
- Electrolyte imbalances
- Severe kidney or liver dysfunction
- Anuria.
- **Mannitol:** active intracranial bleeding except during craniotomy

### Nursing management

- Monitor BP and pulse frequently
- Monitor intake and output ratios and daily weight.
- Do not stop the drugs abruptly unless you speak with the HCP.
- If GI upset occurs then take the med with food or milk.
- Take early in the morning.
- Do not reduce fluid intake.
- Avoid alcohol and non prescription drugs.
- Notify the healthcare provider if: muscle cramps, weakness, dizziness, diarrhea, restlessness, excessive thirst, general weakness, rapid pulse, increased heart rate or pulse, GI distress.
- Weight yourself daily.
- These drugs may cause hypokalemia, monitor serum potassium levels

### Interactions:

- Cisplatin/aminoglycosides: increased risk of ototoxicity
- Anticoagulant/thrombotic: increased risk of bleeding
- Digitalis: increase risk of arrhythmia
- Lithium: increased risk of lithium toxicity
- Hydantoins: decreased diuretic effect
- Nsaid: decreased Diuretics effect

### Simple Nursing Brain bits

- Taking this medication early in the day can prevent injury r/t getting out of bed at night for the client.

Generic	Trade	Safe Dose	Route
Bumetanide	Bumex	0.5- 2 mg/day given in 1- 2 doses	PO
Furosemide:	Lasix	20- 80 mg/day as a single dose	PO, IM, IV
Torsemide	Demadex	2.5- 5 mg once daily	PO

# Diuretics

## - Potassium Sparing

### How it works? "Action"

- Diuretics work by altering the reabsorption or excretion of electrolytes and alter fluid volume.

**Potassium Sparing Diuretics:** reduce the excretion of potassium, block the reabsorption of sodium into the kidney. And thereby increasing sodium and h<sub>2</sub>O in the urine and reduces excretion of K<sup>+</sup>

### Why do we give it? "Reason"

- Hypertension
- Used with antihypertensives
- To reduce edema
- Glaucoma
- Seizures

### Adverse effects

**Neuro:** Dizziness, headache, encephalopathy, lightheadedness, weakness, fatigue

**EENT:** Hearing loss, tinnitus

**CV:** Orthostatic hypotension

**GU:** Electrolyte imbalances, glycosuria

**GI:** Anorexia, nausea, vomiting

**Derm:** Rash, photosensitivity

**Endo:** Hyperglycemia, hyperuricemia.

**F & E:** Dehydration, hypocalcemia, hypochloremia, **hyperkalemia**, hypomagnesemia, hyponatremia, hypokalemia, metabolic alkalosis

**MS:** Arthralgia, muscle cramps, myalgia.

### Contraindications

- Hypersensitivity
- Electrolyte imbalances, hyperkalemia
- Severe kidney or liver dysfunction
- Anuria.
- **Mannitol:** active intracranial bleeding except during craniotomy

### Nursing management

- Monitor BP and pulse frequently
- Monitor intake and output ratios and daily weight.
- Do not stop the drugs abruptly unless you speak with the HCP.
- If GI upset occurs then take the med with food or milk.
- Take early in the morning
- Do not reduce fluid intake
- Avoid alcohol and non prescription drugs.
- Notify the healthcare provider if: muscle cramps, weakness, dizziness, diarrhea, restlessness, excessive thirst, general weakness, rapid pulse, increased heart rate or pulse, GI distress.
- Weight yourself daily.
- These drugs may cause hyperkalemia, monitor serum potassium levels.

### Interactions:

- **Angiotensin converting enzyme/potassium supplement:** Increased risk of hyperkalemia
- **Nsaids/anticoagulants:** decreased diuretic effect

### Simple Nursing Brain bits

**Avoid foods high in potassium:**

Avocado, Acorn squash, Spinach, Sweet potato, Wild-caught salmon, Dried apricots, Pomegranate, Coconut water, White beans, Banana

Generic

Trade

Safe Dose

Route

Spironolactone

Aldactone

25- 400 mg/day  
as a single dose

PO

# Diuretics

## - Thiazides

### How it works? "Action"

- Diuretics work by altering the reabsorption or excretion of electrolytes and alter fluid volume.

**Thiazide Diuretics:** Inhibit reabsorption in the ascending portion of the loop of henle and early distal tubule. Excrete sodium, chloride, and H<sub>2</sub>O

### Why do we give it? "Reason"

- Hypertension
- Used with antihypertensives
- To reduce edema
- Glaucoma
- Seizures
- Renal disease.

### Adverse effects

**Neuro:** Dizziness, headache, encephalopathy, lightheadedness, weakness, fatigue

**EENT:** Hearing loss, tinnitus

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**F & E:** Dehydration, hypocalcemia, hypochloremia, hypokalemia, hypomagnesemia, hyponatremia, hypokalemia, metabolic alkalosis

**MS:** Arthralgia, muscle cramps, myalgia.

### Nursing management

- Monitor BP and pulse frequently .
- Monitor intake and output ratios and daily weight.
- Do not stop the drugs abruptly unless you speak with the DR.
- If GI upset occurs then take the med with food or milk.
- Take early in the morning.
- Do not reduce fluid intake.
- Avoid alcohol and non prescription drugs.
- Notify the healthcare provider if: muscle cramps, weakness, dizziness, diarrhea, restlessness, excessive thirst, general weakness, rapid pulse, increased heart rate or pulse, gi distress.
- Weight yourself daily.
- These drugs may cause hypokalemia, monitor serum potassium levels.
- May cause in serum and urine glucose in diabetic patients. May cause anqin serum bilirubin, calcium, creatinine, and uric acid.

### Interactions:

- **Allopurinol:** increased risk of hypersensitivity to allopurinol
- **Anesthetics:** increased anesthetic effects
- **Antineoplastic drugs:** extended leukopenia
- **Antidiabetic drugs:** hyperglycemia

### Contraindications

- Hypersensitivity
- Electrolyte imbalances
- Severe kidney or liver dysfunction
- Anuria.
- **Mannitol:** active intracranial bleeding except during craniotomy

### Simple Nursing Brain bits

- **Thiazide and Loop:** liver disease, lupus, diabetes, a cross sensitivity may occurs with thiazides and sulfonamides
- Yellow dye may cause allergic reactions or bronchial asthma with thiazides.

Generic	Trade	Safe Dose	Route
Hydrochlorothiazide	Microzide	12.5- 100 mg/day in 1-2 doses	PO
Metolazone	Zaroxolyn	2.5- 5 mg/day	PO

# Skeletal Muscle Drugs

## - Dmards

### How do they work? "Action"

When the immobility and pain of RA can no longer be controlled by pain relief agents and anti-inflammatory drugs, DMARDs are used. These drugs have properties to produce immunosuppression, which in turn decreases the body's immune response. Therefore, in RA treatment, DMARDs are useful for their immunosuppressive ability.

### Indications

- Rheumatoid arthritis
- Crohn's disease
- Fibromyalgia

### Adverse Reactions

- Nausea
- Stomatitis
- Alopecia (hair loss)
- The adverse reactions to sulfa-based drugs, such as sulfasalazine, include ocular changes, gastrointestinal (GI) upset, and mild pancytopenia.

### Contraindications

Patients with renal insufficiency, liver disease, alcohol abuse, pancytopenia, or folate deficiency should not take methotrexate. Etanercept (Enbrel), adalimumab (Humira), and infliximab (Remicade) should not be used in patients with congestive heart failure or neurological demyelinating diseases. Anakinra (Kineret) should not be used in combination with etanercept, adalimumab, or infliximab.

### Interactions

- Sulfa antibiotics: Increased risk of methotrexate toxicity

### Nursing management

- Because DMARDs are designed to produce immunosuppression, patients need to be monitored routinely for infections. Instruct patients to report any problem, no matter how minor, such as a cold or open sore—even these can become life-threatening.
- Explain carefully that treatment for the disorder includes drug therapy, as well as other medical management, such as diet, exercise, limitations or specifications of activity, and periodic physical therapy treatments.
- Teach the importance of asking the primary health care provider before taking any nonprescription drugs or supplements.
- Some drugs used for RA require self-administered subcutaneous injections. Teach the patient and family proper injection and disposal techniques.
- Teach about site rotation, and have the patient demonstrate proper injection technique before this becomes a self-administered procedure.
- Patients need to be taught how to manage the discomfort to the site of injection and to report redness, pain, and swelling to the primary health care provider.
- When using drugs to treat RA:
- When taking methotrexate, use a calendar or some other memory device to remember to take the drug on the same day each week.
- Notify the primary health care provider immediately if any of the following occur: sore mouth or sores in the mouth, diarrhea, fever, sore throat, easy bruising, rash, itching, or nausea and vomiting.
- Women of childbearing age should use an effective contraceptive during therapy with methotrexate and for 8 weeks after therapy.

Generic	Trade	Use	Dose
<b>Adalimumab</b>	Humira	RA; other autoimmune disorders (e.g., Crohn's disease)	40 mg subq every other week
<b>Etanercept</b>	Enbrel	RA	25 mg subcut twice weekly, or 50 mg subcut weekly
<b>Hydroxychloroquine</b>	Plaquenil	RA, antimalarial	400–600 mg/day orally

# Neuromuscular Drugs

## - Dopamine Receptor Agonist

### How do they work? "Action"

It is thought that non ergot dopamine receptors act directly on postsynaptic dopamine receptors of nerve cells in the brain, mimicking the effects of dopamine in the brain.

### Indications

Treatment of the signs and symptoms of Parkinson's disease. It is also used in the treatment of RLS. apomorphine (Apokyn) is used for the on-off phenomena of Parkinson's disease. Antiemetic therapy must be initiated with this drug.

### Adverse Reactions

- Nausea, dizziness, vomiting
- Somnolence, hallucinations, confusion, visual disturbances
- Postural hypotension, abnormal involuntary movements
- Headache

### Contraindications

Dopamine receptor agonists are used with caution in patients with dyskinesia, orthostatic hypotension, hepatic or renal impairment, cardiovascular disease, and a history of hallucinations or psychosis. Both ropinirole and pramipexole are pregnancy category C drugs, and safety during pregnancy has not been established.

### Interactions

- Cimetidine, ranitidine: Increased dopamine agonist effectiveness
- verapamil, quinidine: Increased dopamine agonist effectiveness
- Estrogen: Increased dopamine agonist effectiveness
- Phenothiazines: Decreased dopamine agonist effectiveness

### Nursing management

- Hallucinations occur more often in the older adult than in the younger adult receiving anti parkinson drugs. This is especially likely when taking dopamine receptor agonists.
- If dizziness, drowsiness, or blurred vision occurs, avoid driving or performing other tasks that require alertness.
- Avoid the use of alcohol unless use has been approved by the primary health care provider.
- Relieve dry mouth by sucking on hard candy (unless the patient has diabetes) or taking frequent sips of water. Consult a dentist if dryness of the mouth interferes with wearing, inserting, or removing dentures or causes other dental problems.
- Keep all appointments with the primary health care provider or clinic personnel because close monitoring of therapy is necessary.
- Ask your primary health care provider before buying vitamin supplements when taking levodopa. Vitamin B6 (pyridoxine) may interfere with the action of levodopa.

Generic	Trade	Use	Dose
<b>Apomorphine</b>	Apokyn	Parkinson's disease "off" episode	0.2 mL as needed for "off" episode
<b>Pramipexole</b>	Mirapex	Parkinson's disease, RLS	0.125–1.5 mg orally TID
<b>Ropinirole</b>	Requip	Parkinson's disease, RLS	0.25–1 mg orally TID

# Common Drug Antidotes & Therapeutic Ranges

Drug	Antidote
Opioid Analgesics	Naloxone
Heparin	Protamine sulfate
Coumadin	Vitamin K
Benzodiazepines	Flumazenil
Acetaminophen	Acetylcysteine
Magnesium sulfate	Calcium gluconate
Cholinergics	Atropine
Digoxin	Digiband
Beta blockers	Glucagon
Aspirin	Sodium bicarbonate
Cyanide	Sodium thiosulfate

Drug	Therapeutic range
<b>Digoxin</b>	0.5–2.0 mg/ml
<b>Lithium</b>	0.8–1.5 mEq/ L
<b>Dilantin</b>	10–20 mcg/ dL
<b>Theophylline</b>	10–20 mcg/dL
<b>Gentamycin</b>	5–10 mcg/ml (peak), <2.0 mcg/ml (valley)
<b>Vancomycin</b>	20–40 mcg/ml (peak), 5 to 15 mcg/ml (trough)
<b>Carbamazepine</b>	4–10 mcg/ml
<b>Phenobarbital</b>	15–40 mcg/mL
<b>Phenytoin</b>	10–20 mcg/dL
<b>Tobramycin</b>	5–10 mcg/mL (peak), 0.5–2.0 mcg/mL (valley)
<b>Valproic Acid</b>	50–100 mcg/ml

# Common Drug Suffixes

## CNS Neuromuscular

Family	Drug	Example
<b>-chol</b>	Muscarinic agonist	carbachol
<b>-trop</b> <b>-scop-</b>	Muscarinic blocker	Atropine Scopolamine
<b>-stigmine</b>	Achase inhibitor	Neostigmine
<b>-curium</b> <b>-curonium</b>	Nondepolarizing neuromuscular blocker	Atracurium Mivacurium Pancuronium
<b>-ane</b>	Inhaled anesthetic	Halothane
<b>-caine</b>	Local anaesthetic	Lidocaine
<b>-pam</b> <b>-lam</b>	Benzodiazepine	Diapam Lorazepam
<b>-tal</b>	Barbiturate	Phenobarbital
<b>-zine</b>	Typical antipsychotic or antihistamine	Chlorpromazine Thoridazine
<b>-apine</b> <b>-idone</b>	Atypical antipsychotic	Clozapine Risperidone
<b>-capone</b>	COMT inhibitor for parkinson's disease	Tolcapone Entacapone

## Cardiovascular

Family	Drug	Example
<b>-olol</b>	Beta blocker	metoprolol
<b>-alol</b> <b>-ilol</b>	Alpha-Beta blockers	Sotalol cardviolol
<b>-dipine</b>	Vascular Calcium channel blocker	Nifedipine
<b>-zosin</b>	Alpha -1 blocker	Terazosin Doxazosin
<b>-pril</b>	Ace inhibitor	Lisinopril
<b>-sartan</b>	ARB	Losartan
<b>-darone</b>	Antiarrhythmic	Amiodarone
<b>-statin</b>	Anti hyperlipidemic Hmg coa reductase inhibitor	Rosuvastatin
<b>-zolamide</b>	Carbonic anhydrase inhibitor	Acetazolamide
<b>-semide</b>	Loop diuretic	Furosemide
<b>-parin</b>	Low molecular weight heparin	Enoxaparin
<b>-rudin</b>	Direct thrombin inhibitor	Lepirudin

## Infectious Disease

Family	Drug	Example
<b>-penam</b>	Cell wall inhibitor "Broad spectrum"	Imipenem Meropenem
<b>-floxacin</b>	Fluoroquinolone	Ciprofloxacin Levofloxacin
<b>-conazole</b> <b>"Azole"</b>	Antifungal	Ketoconazole Fluconazole
<b>-quine</b>	Antimalarial	Chloroquine Primaquine
<b>-ovir</b>	Antiviral "DNA polymerase inhibitors" treats herpes	Acyclovir Ganciclovir Valacyclovir
<b>-ivir</b>	Neuraminidase inhibitor "treats influenza"	Zanamivir
<b>-avir</b>	Antiviral protease inhibitor "treats HIV/AIDS"	Indinavir Ritonavir

## GI

Family	Drug	Example
<b>-tidine</b>	H2 blocker	Cimetidine
<b>-prazole</b>	PPI	Pantoprazole
<b>-setron</b>	5HT3 blocker "Anti Emetic"	Ondansetron

## Oncology

Family	Drug	Example
<b>vin-</b>	Microtubule inhibitor	Vincristine Vinblastine
<b>-rubicin</b>	Cancer drug	Doxorubicin
<b>-mab</b>	Monoclonal antibody drug	Rituximab
<b>-tinib</b>	Tyrosine kinase inhibitor	Imatinib

# Emetics

## How do they work? "Action"

They neutralize or reduce the acidity of stomach and duodenal contents by combining with HCl and increasing the pH of the stomach acid. They may increase the sphincter tone of the lower esophagus. Examples of antacids include aluminum (Amphojel), magaldrate (Riopan), and magnesium (Milk of Magnesia).

## Why are they used for? "Indications"

Used to empty the stomach rapidly when someone has ingested poison or for drug overdose

## Adverse effects

- Dehydration
- Nausea vomiting
- Tachycardia
- Electrolyte imbalance

## Interactions:

- Activated charcoal: Decreases the effects of Ipecac

## Contraindications

- **Do not use** on patients who are fully conscious
- **Only use under the supervision of a licensed healthcare provider**
- **Do not use** if turpentine, corrosives, alkalies (lye for soap), strong acids, petroleum distillates, kerosene, cleaning fluid, paint thinner, or furniture polish.
- **Do not use** if patient is comatose, has altered mental status, or is at risk for aspiration of stomach contents
- **Do not give** if a patient is having seizures
- **Do not give** if the substance ingested can cause altered mental status or seizures
- **Do not give** if the agent is caustic or corrosive such as kerosene which brings a high risk of pulmonary aspiration.
- **Do not give** if the patient has a medical condition that can be exacerbated by vomiting; Bradycardia severe hypertension, hemorrhagic diathesis.
- **Do not give** during pregnancy or lactation
- **Do not give** if the patient has Crohn's disease

## Nursing management

- **Before giving the emetic you must know:** The chemical ingested, time ingested, and what symptoms occur before being brought in.
- The primary healthcare provider should also call the poison control center to obtain information on proper treatment.

## Generic

## Trade

## Use

## Dose

Ipecac

n/a

Induction of vomiting post poison ingestion or drug overdose

To cause vomiting after suspected poisoning: 15mL ipecac syrup followed by 1-2 glasses of water. This dose may be repeated once in 20 minutes if vomiting does not occur. Before using ipecac syrup to treat poisoning, call a poison control hotline for advice. Ipecac syrup is available both as a nonprescription product and as an FDA-approved prescription product.

# Epinephrine

## Epi auto-injectors "Epi-Pen"

### Indication:

Anaphylaxis (severe allergic reaction)



### MOA:

- Vasopressor that presses the vital signs up!
- Increased BP, RR, HR

### KEY POINT

**HESI** Epi is the **1st drug** to use for anaphylaxis.

**ATI** **First signs** of anaphylaxis (hives, dyspnea, hypotension) **give Epi Pen**

- Repeat every 5 -15 minutes if s/s continue **NCLEX TIP**
- Repeat Epi until signs & symptoms **resolve!** **NCLEX TIP**

**1st**

**Epinephrine**

**2nd**

**Diphenhydramine**

**3rd**

**Albuterol Steroids**

### KAPLAN

#### Patient scenario:

Administration of ampicillin & client reports itchiness and **difficulty breathing**.

- Priority actions:
  1. **Stop** infusion
  2. Auscultate lungs
  3. Prepare to administer **epinephrine 1st**
- **Effective management of shock**
  - BP 130/67
  - Apical HR 99
  - Cap refill less than 2 seconds



### Normal EXPECTED

#### Side Effects

- Tachycardia (HR over 100)
- Palpitations
- Dizziness



### How to use Epi-Pen

#### KEY POINTS

1. Inject into **outer THIGH** at **90 degree** angle at onset of s/s

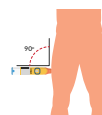
**HESI** "Stab pen into outer thigh"

- Hold in place for **10 seconds**

2. Seek immediate medical attention after use!

- Go to the hospital!

3. Store epi pens in **dark place at room temperature** (not too cold/ not too hot)



### Notes

# Urinary System Drugs

## - Erectile Dysfunction Drugs

### How do they work? "Action"

Phosphodiesterase type 5 inhibitors are oral drugs that facilitate the enzyme that allows blood flow into the penis, resulting in an erection.

### Indications

- Allows blood flow into the penis, resulting in an erection.

### Adverse Reactions

- Headache, flushing, GI upset, nausea, and runny nose or congestion

### Contraindications

- Drugs for ED should not be taken by men who use nitrates (e.g., for anginal pain). Because these drugs affect smooth muscle, patients with pre-existing cardiac problems, especially those using drugs to lower blood pressures
- Medical attention should be sought for erections sustained for more than 4 hours.
- Pulmonary veno-occlusive disease
- Chronic use not recommended for pulmonary hypertension due to lack of efficacy INCREASED risk of death.

### Interactions

- **Antiretrovirals:** Increased effectiveness of ED drug
- **Antihypertensives:** Increased effectiveness of antihypertensive

### Nursing management

- **Viagra:** Determine erectile dysfunction before administration. Sildenafil has no effect in the absence of sexual stimulation.
- **Revatio:** Monitor hemodynamic parameters and exercise tolerance prior to and periodically during therapy.
- Instruct patient to take sildenafil as directed. For erectile dysfunction, take approximately 1 hour before sexual activity and not more than once per day. If taking sildenafil for pulmonary arterial hypertension, take missed doses as soon as remembered unless almost time for next dose; do not double doses.
- Advise patient that Viagra is not indicated for use in women.
- Caution patient not to take sildenafil concurrently with alpha-adrenergic blockers (unless on a stable dose) or nitrates. If chest pain occurs after taking sildenafil, instruct patient to seek immediate medical attention. Advise patient taking sildenafil for pulmonary arterial hypertension to notify health care professional of all Rx or OTC medications, vitamins, or herbal products being taken and to consult with health care professional before taking other medications.
- Instruct patient to notify health care professional promptly if erection lasts longer than 4 hr or if experience sudden or decreased vision loss in one or both eyes or loss or decrease in hearing, ringing in the ears, or dizziness.
- Inform patient that sildenafil offers no protection against sexually transmitted diseases. Counsel patient that protection against sexually transmitted diseases and HIV infection should be considered.

Generic	Trade	Use	Dose
<b>Sildenafil</b>	Viagra	Erectile dysfunction	25–50 mg orally 30–60 min before sexual activity
<b>Tadalafil</b>	Cialis	Erectile dysfunction, BPH	5–20 mg orally, take daily for BPH, as needed for sexual activity Up to 36 hours before sexual activity
<b>Vardenafil</b>	Levitra, Staxyn	Erectile dysfunction	5–20 mg orally 60 min before sexual activity 4 hours before sexual activity

# Urinary System Drugs

## - Estrogens

### How do they work? "Action"

In addition to contraception, estrogen is most commonly used in HRT (or estrogen replacement therapy [ERT]) in postmenopausal women.

### Indications

Changes to aging tissues can be lessened when estrogens are used for the following:

- Relief of moderate to severe vasomotor symptoms of menopause (flushing, sweating)
- Treatment of atrophic vaginitis
- Treatment of osteoporosis in women past menopause
- Palliative treatment of advanced prostatic carcinoma (in men)
- Selected cases of advanced breast carcinoma (Ford 516)

### Adverse Reactions

- Headache, migraine
- Dizziness, mental depression
- Dermatitis, pruritus
- Chloasma (pigmentation of the skin) or melasma (discoloration of the skin), which may continue when use of the drug is discontinued
- Nausea, vomiting
- Abdominal bloating and cramps
- Breakthrough bleeding, withdrawal bleeding, spotting, changes in menstrual flow
- Dysmenorrhea, premenstrual-like syndrome, amenorrhea
- Vaginal candidiasis, cervical erosion, vaginitis
- Steepening of corneal curvature
- Intolerance to contact lenses
- Edema, rhinitis, changes in libido
- Breast pain, enlargement, and tenderness
- Reduced carbohydrate tolerance
- Venous thromboembolism, pulmonary embolism
- Weight gain or loss
- Generalized and skeletal pain
- Increased risk of endometrial cancer, gallbladder disease, hypertension, liver adenoma, thromboembolic disease, hypercalcemia

### Contraindications

- breast cancer (except for metastatic disease),
- estrogen-dependent neoplasms
- undiagnosed abnormal genital bleeding
- and thromboembolic disorders. T
- he progestins also are contraindicated in patients with cerebral hemorrhage or impaired liver function.
- Both the estrogens and progestins are classified as pregnancy category X drugs and are contraindicated during pregnancy. (Ford 518)

### Interactions

- **Oral anticoagulants:** Decreased anticoagulant effect
- **Tricyclic antidepressants:** Increased effectiveness of antidepressant
- **Rifampin:** Increased risk of breakthrough bleeding
- **Hydantoins:** Increased risk of breakthrough bleeding and pregnancy

### Nursing management

Black cohosh, an herb reported to be beneficial in managing symptoms of menopause, is generally regarded as safe when used as directed. Black cohosh is a member of the buttercup family. Black cohosh tea is not considered as effective as other forms. Boiling the root releases only a portion of the therapeutic constituents. The benefits of black cohosh (not to be confused with blue cohosh) include:

#### Reduction in physical symptoms of menopause:

- hot flashes, night sweats, headache
- heart palpitations, dizziness, vaginal atrophy, and tinnitus (ringing in the ears)

#### Decrease in psychological symptoms of menopause:

- insomnia, nervousness, irritability, and depression
- Improvement in menstrual cycle regularity by balancing the hormones and reducing uterine spasms. Black cohosh is contraindicated during pregnancy. Toxic effects include dizziness, headache, nausea
- impaired vision, and vomiting.

This herb is purported to be an alternative to HRT. (Ford 518)

# Estrogens

## How do they work? "Action"

Estrogens are secreted by the ovarian follicle and in smaller amounts by the adrenal cortex. They are important in the development and maintenance of the female reproductive system and the primary and secondary sex characteristics they

- promote growth and development of the vagina, uterus, fallopian tubes, and breasts.
- affect the release of pituitary gonadotropin
- fluid retention, protein anabolism, thinning of the cervical mucus, and inhibition or facilitation of ovulation.
- contribute to the conservation of calcium and phosphorus, the growth of pubic and axillary hair, and pigmentation of the breast areola and genitals.

## Indications

- combination with progesterones as a contraceptive agent
- as estrogen replacement therapy (ERT) in postmenopausal women

## Adverse Reactions

### CNS:

- Headache, migraine
- Dizziness, mental depression

### Dermatologic

- Dermatitis, pruritus
- Chloasma (pigmentation of the skin) or melasma (discoloration of the skin), which may continue when use of the drug is discontinued

### Gastrointestinal

- Nausea, vomiting
- Abdominal bloating and cramps

### Genitourinary

- Breakthrough bleeding, withdrawal bleeding, spotting, change in menstrual flow
- Dysmenorrhea, premenstrual-like syndrome, amenorrhea
- Vaginal candidiasis, cervical erosion, vaginitis

### Local

- Pain at injection site or sterile abscess with parenteral form of the drug
- Redness and irritation at the application site with transdermal system

### Ophthalmic

- Steepening of corneal curvature
- Intolerance to contact lenses

### Miscellaneous

- Edema, rhinitis, changes in libido
- Breast pain, enlargement, and tenderness
- Reduced carbohydrate tolerance
- Venous thromboembolism, pulmonary embolism
- Weight gain or loss
- Generalized and skeletal pain (Ford 496)

## Contraindications

Estrogen and progestin therapy is contraindicated in patients with known hypersensitivity to the drugs, breast cancer (except for metastatic disease), estrogen-dependent neoplasms, undiagnosed abnormal genital bleeding, and thromboembolic disorders. The progestins also are contraindicated in patients with cerebral hemorrhage or impaired liver function. Both the estrogens and progestins are classified as pregnancy category X drugs and are contraindicated during pregnancy. (Ford 497) Estrogens are used cautiously in patients with gallbladder disease, hypercalcemia (may lead to severe hypercalcemia in patients with breast cancer and bone metastasis),

## Interactions

- **Oral anticoagulants:** Decreased anticoagulant effect
- **Tricyclic antidepressants:** Increased effectiveness of antidepressant
- **Rifampin:** Increased risk of breakthrough bleeding
- **Hydantoins:** Increased risk of breakthrough bleeding and pregnancy

## Nursing management

- Monitor blood pressure, pulse, respiratory rate, and weight
- Estrogens may be administered orally, IM, intravenously (IV), transdermally, or intravaginally.
- Monitor for excess fluid volume and sodium retention
- Teach the patient how to monitor for signs of thromboembolic effects, such as pain, swelling, and tenderness in the extremities, headache, chest pain, and blurred vision. These adverse effects are reported immediately to the primary health care provider
- Carefully read the patient package insert available with the drug. If there are any questions about this information, discuss them with the primary health care provider.
- If GI upset occurs, take the drug with food.
- Notify the primary health care provider if any of the following occurs: pain in the legs or groin area; sharp chest pain or sudden shortness of breath; lumps in the breast; sudden severe headache; dizziness or fainting; vision or speech disturbances; weakness or numbness in the arms, face, or legs; severe abdominal pain; depression; or yellowing of the skin or eyes.
- If pregnancy is suspected or abnormal vaginal bleeding occurs, stop taking the drug and contact the primary health care provider immediately.
- Patient with diabetes: Check the blood glucose daily, or more often. Contact the primary health care provider if the blood glucose is elevated. An elevated blood glucose level may require a change in diabetic therapy (insulin, oral antidiabetic drug) or diet; these changes must be made by the primary health care provider. (Ford 500)

Generic	Trade	Use	Dose
<b>Estrogen conjugated</b>	premarin	<b>Oral:</b> hypogonadism, primary ovarian failure <b>Parenteral:</b> abnormal uterine bleeding from hormonal imbalance	0.3–2.5 mg/day orally IM: 25 mg/injection
<b>Estrogens esterified</b>	menest	<b>Oral:</b> hypogonadism, primary ovarian failure <b>Parenteral:</b> abnormal uterine bleeding from hormonal imbalance	1–5 mg IM every 3–4 wk
<b>Estropipate</b>	Ogden, ortho est	Female hypogonadism, ovarian failure 0	0.3–2.5 mg/day orally IM: 25 mg/injection

# TB Drugs: Ethambutol

## How do they work? "Action"

Many antitubercular drugs are bacteriostatic against the *M. tuberculosis* bacillus. These drugs usually act to inhibit bacterial cell wall synthesis, which slows the multiplication rate of the bacteria. Isoniazid is bactericidal, with rifampin and streptomycin having some bactericidal activity.

## Indications

- Treatment of TB in a protocol

## Adverse reactions

- Anaphylactoid reactions (unusual or exaggerated allergic reactions)
- Optic neuritis
- Dermatitis and pruritus (itching)
- Joint pain
- Anorexia
- Nausea and vomiting

## Contraindications & Caution

Ethambutol is not recommended for patients with a history of hypersensitivity to the drug or children younger than 13 years. The drug is used with caution during pregnancy (category B), in patients with hepatic or renal impairment, and in patients with diabetic retinopathy or cataracts. (Ford 105)

## Interactions

- **Antacids containing aluminum salts:** Reduced absorption of isoniazid
- **Anticoagulants:** Increased risk for bleeding
- **Phenytoin:** Increased serum levels of phenytoin
- **Alcohol:** Higher incidence of drug-related hepatitis

## Nursing alert

Older adults are particularly susceptible to a potentially fatal hepatitis when taking isoniazid, especially if they consume alcohol on a regular basis. Two other antitubercular drugs, rifampin and pyrazinamide, can cause liver dysfunction in the older adult as well. Careful observation and monitoring for signs of liver impairment are necessary (e.g., increased serum aspartate aminotransferase [AST], alanine aminotransferase [ALT], and bilirubin levels, and jaundice). (Ford 107)

## Nursing management

- Ask the patient what he or she thinks causes the symptoms; promote health literacy by integrating the patient's beliefs and fears into how the bacteria invades the body and how the drugs work to kill it.
- Discuss tuberculosis, its causes and communicability, and the need for long-term therapy for disease control using simple, non medical terms.
- Review the drug therapy regimen, including the prescribed drugs, doses, and frequency of administration.
- Reassure the patient that various combinations of drugs are effective in treating tuberculosis.
- Urge the patient to take the drugs exactly as prescribed and not to omit, increase, or decrease the dosage unless directed to do so by the health care provider.
- Instruct the patient about possible adverse reactions and the need to notify the prescriber should any occur.
- Arrange for direct observation therapy with the patient and family.
- Instruct the patient in measures to minimize gastrointestinal upset.
- Advise the patient to avoid alcohol and the use of nonprescription drugs, especially those containing aspirin, unless use is approved by the health care provider.
- Reassure the patient and family that the results of therapy will be monitored by periodic laboratory and diagnostic tests and follow-up visits with the health care provider.

## Phases of treatment

- The recommended treatment regimen is for the administration of the primary drugs—rifampin (Rifadin), isoniazid (INH), pyrazinamide, and ethambutol (Myambutol)—for a minimum of 2 months
- The second or continuation phase includes only the drugs rifampin and isoniazid. The CDC recommends this phase for 4 months or up to 7 months in special populations.

## Special populations

- Positive sputum culture after completion of initial treatment
- Cavitory (hole or pocket of) disease and positive sputum culture after initial treatment
- When pyrazinamide was not included in the initial treatment
- Positive sputum culture after initial treatment in a patient with previously diagnosed HIV infection

## Generic

## Trade

## Use

## Dose

Ethambutol  
Primary drug


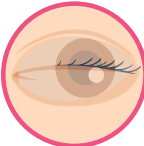


Myambutol

Pulmonary TB

15–25 mg/kg/day orally

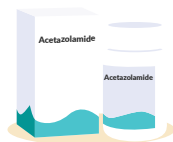
# Eye & Ear

## Eye Administration:

<b>1.</b> Drop medication into Conjunctival Sac 	<b>2.</b> Gently close & rotate the eyes around after administration. 	<b>3.</b> Apply GENTLE pressure to the corner of the canthus 	<b>4.</b> Wait 5 minutes 
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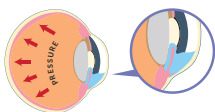
## Drug name:

Acetazolamide



## Indication:

Chronic glaucoma to decrease pressure inside the eye



## ATI Question

- **Indication:** Chronic, open angle **glaucoma**
- **Patient Teaching:** Report **paresthesia** (facial regions) to HCP immediately

**Contraindications**  
allergy to sulfa drugs.

## KAPLAN Question

**Acetazolamide** =  
contraindicated for  
sulfa allergy



## Side Note:

**Anti Cholinergics**



**Avoid AntiCholinergics!**  
**= Glaucoma**




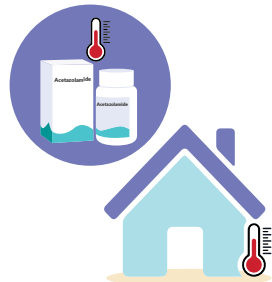
- **NO** - Atropine
- **NO** - Benztropine
- **NO** - Ipratropium
- **NO** - Oxybutynin



## Ear Administration:

1. Affected ear up - tilt head or lay down
2. Straighten ear canal  
Adults - pull up & out  
Child - pull down & back
3. NEVER occlude ear with dropper
4. Warm med at room temperature

## 4 KEY POINTS

<b>1.</b> <b>Affected EAR UP !!</b> 	<b>2.</b> <b>Straighten the Ear Canal</b> 
<b>3.</b> <b>Do not occlude the ear with a dropper!</b> 	<b>4.</b> <b>Keep med warm or room temp</b> 

## Notes

# Factor XA Inhibitors

## Drug name:

- Rivaro**xaban**  
(brand name Xarelto)
- Edo**xaban**
- Api**xaban**



## Key Points:

- **AVOID ASPIRIN** while taking this med
- **AVOID** any & all over the counter meds that increase bleeding! Especially **NSAIDS**!



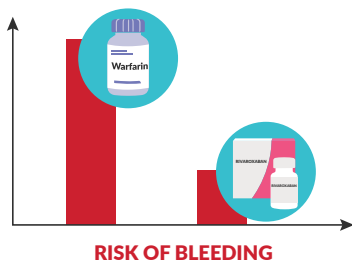
- The supplements - **EGGO**

- **E** - Vitamine E
- **G** - Garlic
- **G** - Ginger Ginkgo
- **O** - Omega 3's



## Good News:

- There is a lower risk of bleeding compared to warfarin
- NO need for routine clotting studies
- NO need to avoid Vit K food such as leafy greens or liver. Eat up that liver & spinach



## MEMORY TRICK Rivaro**xaban**



RIVER ROCK band! Blood flows like RIVER

## Bad News:

- Risk for **neurological impairment**  
Rock Band can cause brain **bleeding**, think too much head banging



## HESI -Common Question

- Rivaro**xaban**
  - Teach client methods to reduce bleeding.



## Notes

# Anti Infectives

## - Fluoroquinolones

### How do they work? "Action"

The fluoroquinolones exert their bactericidal effect by interfering with the synthesis of bacterial DNA. This interference prevents cell reproduction, causing death of the bacterial cell (Ford 96)

### Indications

- Lower respiratory infections
- Bone and joint infections
- Urinary tract infections
- Infections of the skin
- Sexually transmitted infections

### Adverse Reactions

- Nausea
- Diarrhea
- Headache
- Abdominal pain or discomfort
- Dizziness
- Photosensitivity

### Contraindications & Caution

- Hypersensitivity
- Children younger than 12 or adults older than 60 who are on corticosteroids because of the risk of achilles tendonitis

### Interactions:

- **Theophylline:** Increased serum theophylline level
- **Cimetidine:** Interferes with elimination of the antibiotic
- **Oral anticoagulants:** Increased risk of bleeding
- **Antacids, iron salts, or zinc:** Decreased absorption of the antibiotic
- **Nonsteroidal anti-inflammatory drugs (NSAIDs):** Risk of seizure.

### Nursing management

- Before administering any antibiotic be sure to evaluate the results of the culture and sensitivity test.
- Monitor labs and evaluate the effectiveness of the treatment
- Monitor vitals and temperature
- Complete the entire course of treatment. Do not stop the drug, except on the advice of a primary health care provider, before the course of treatment is completed, even if symptoms improve or disappear. Failure to complete the prescribed course of treatment may result in a return of the infection.
- There is a risk with all fluoroquinolone drugs of causing pain, inflammation, or rupture of a tendon. The Achilles tendon is particularly vulnerable. Those 60 years of age and older who take corticosteroids are at greatest risk for tendon rupture.

### Favorable Outcomes

- A superinfection can develop rapidly and is potentially serious and even life-threatening. Antibiotics can disrupt the normal flora (nonpathogenic bacteria in the bowel), causing a secondary infection or superinfection. This new infection is "superimposed" on the original infection. The destruction of large numbers of nonpathogenic bacteria (normal flora) by the antibiotic alters the chemical environment. This allows uncontrolled growth of bacteria or fungal microorganisms that are not affected by the antibiotic being administered. A superinfection may occur with the use of any antibiotic, especially when these drugs are given for a long time or when repeated courses of therapy are necessary. (Ford 96)

Generic	Trade	Use	Dose
Ciprofloxacin	Cipro	Treatment of infections due to susceptible microorganisms	250-750 mg orally q 12 hr; 200-400 mg IV q 12 hr
Gemifloxacin	Factive	Bronchitis and community-acquired pneumonia	320 mg/day orally
Levofloxacin	Levaquin	Treatment of infections due to susceptible microorganisms	250-750 mg/day orally

# Anti-Coagulants

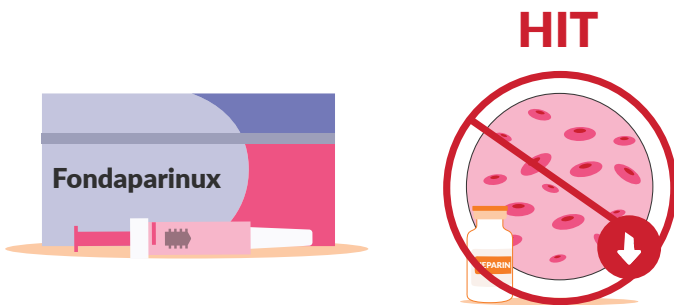
## Fondaparinux

### Drug name:

**Fondaparinux**  
(related to low weight heparins)

### Major Advantage:

No risk for HIT



### Caution:

#### DON'T GIVE IT:

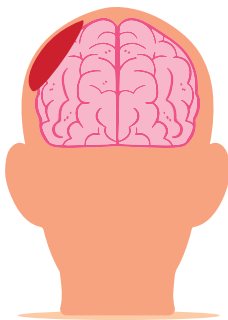
To patient who report severe back pain, decreased LOC or paralysis.  
Always call the HCP and HOLD the med!



### Major Disadvantage:

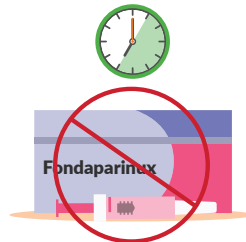
Key Term:

Fondaparinux can cause an **epidural bleed!**

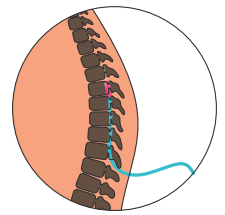


### NCLEX KEY TERMS

**NO** Fondaparinux for  
at least **6 hours** after surgery



**NO** Anticoagulants  
with spinal **epidural catheter**



Notes

# GI Stimulants

## How do they work? "Action"

Increases the motility of the upper GI tract without increasing the production of secretions. By sensitizing tissue to the effects of acetylcholine, the tone and amplitude of gastric contractions are increased, resulting in faster emptying of gastric contents into the small intestine. It also inhibits stimulation of the vomiting center in the brain.

## Interactions:

- **Cholinergic blocking drugs or opioid analgesics:** Decreased effectiveness of metoclopramide
- **Cimetidine:** Decreased absorption of cimetidine
- **Digoxin:** Decreased absorption of digoxin
- **Monoamine oxidase inhibitor antidepressants:** Increased risk of hypertensive episode
- **Levodopa:** Decreased metoclopramide and levodopa

## Why are they used for? "Indications"

- GERD
- Gastric stasis (failure to move food normally out of the stomach) in diabetic patients, in patients with nausea and vomiting associated with cancer chemotherapy, and in patients in the immediate postoperative period

## Adverse effects

Higher doses or prolonged administration may produce central nervous system (CNS) symptoms, such as restlessness, drowsiness, dizziness, extrapyramidal effects (tremor, involuntary movements of the limbs, muscle rigidity), facial grimacing, and depression.

## Contraindications

- Hypersensitivity to the drug
- GI obstruction, gastric perforation or hemorrhage
- Pheochromocytoma.
- Patients with Parkinson's disease or a seizure disorder who are taking drugs likely to cause extrapyramidal symptoms should not take these drugs.

## Caution

- Diabetes and cardiovascular disease
- Caution during pregnancy and lactation because it is excreted in breastmilk

## Nursing management

- When one of these drugs is given IV, monitor the rate of infusion at frequent intervals. Too rapid an infusion may induce cardiac arrhythmias.
- Give on an empty stomach
- Monitor for symptoms of EPS and tardive dyskinesia
- Keep a record of the patient's bowel movements, because these drugs may cause constipation or diarrhea.
- Observe the patient for signs of dehydration, which include poor skin turgor, dry mucous membranes, decrease in or absence of urinary output, concentrated urine, restlessness, irritability, increased respiratory rate, and confusion.
- Instruct the patient to chew the tablets thoroughly before swallowing and then drink a full glass of water or milk.
- Magnesium-containing products may produce a laxative effect and may cause diarrhea; aluminum- or calcium-containing antacids may cause constipation.
- Taking too much antacid may cause the stomach to secrete excess stomach acid. Consult the primary health care provider or pharmacist about appropriate dose. Do not use the maximum dose for more than 2 weeks, except under the supervision of a primary health care provider

## Critical Thinking

- Tardive dyskinesia (nonreversible, involuntary muscle spasms), which is typically associated with conventional antipsychotics, is known to occur with long-term use (12 weeks or more) of metoclopramide. Immediately report extrapyramidal symptoms to prevent tardive dyskinesia from occurring.

### Generic

### Trade

### Use

### Dose

Metoclopramide

Reglan

Diabetic gastroparesis, GERD, prevention of nausea and vomiting

10–15 mg orally; 10–20 mg IM, IV

# Glucocorticoids

## How do they work? "Action"

Glucocorticoids influence or regulate functions such as the immune response; glucose, fat, and protein metabolism; and the anti-inflammatory response. Glucocorticoids enter target cells and bind to receptors, initiating many complex reactions in the body

## Indications

- Adrenocortical insufficiency (replacement therapy)
- Allergic reactions
- Collagen diseases (e.g., systemic lupus erythematosus)
- Dermatologic conditions
- Rheumatic disorders
- Shock
- Multiple other conditions

## Contraindications

- Tuberculosis
- fungal and antibiotic-resistant infections.

**Glucocorticoids are administered with caution to patients** with renal or hepatic disease, hypothyroidism, ulcerative colitis, diverticulitis, peptic ulcer disease, inflammatory bowel disease, hypertension, osteoporosis, convulsive disorders, or diabetes.

**Patients taking ACTH** should avoid any vaccinations with live virus. The live virus vaccines can potentiate virus replication with ACTH, increase any adverse reaction to the vaccine, and decrease the patient's antibody response to the vaccine.

## Interactions:

- **Cholestyramine:** Effects of hydrocortisone may be decreased.
- **Oral contraceptives:** Effects of corticosteroid may be increased.
- **Estrogens:** Effects of corticosteroid may be increased.
- **Hydantoins:** Effects of corticosteroid may be decreased.
- **Ketoconazole:** Effects of corticosteroid may be increased.
- **Rifampin:** Effects of corticosteroid may be decreased.
- **Anticholinesterases:** Anticholinesterase effects may be antagonized in myasthenia gravis.
- **Oral anticoagulants:** Anticoagulant dose requirements may be reduced. Corticosteroids may decrease the anticoagulant action.
- **Digitalis glycosides:** Coadministration may enhance the possibility of digitalis toxicity associated with hypokalemia.
- **Isoniazid:** Isoniazid serum concentrations may be decreased.
- **Potassium-depleting diuretics:** Hypokalemia may occur.
- **Salicylates:** Corticosteroids will reduce serum salicylate levels and may decrease their effectiveness.
- **Theophyllines:** Alterations in the pharmacologic activity of either agent may occur.

## Adverse Reactions

- **Fluid and electrolyte disturbances:** Sodium and fluid retention, potassium loss, hypokalemic alkalosis, hypertension, hypokalemia, hypotension or shock-like reactions
- **Musculoskeletal disturbances:** Muscle weakness, loss of muscle mass, tendon rupture, osteoporosis, aseptic necrosis of femoral and humeral heads, spontaneous fractures
- **Cardiovascular disturbances:** Thromboembolism or fat embolism; thrombophlebitis; necrotizing angitis; syncopal episodes; cardiac arrhythmias; aggravation of hypertension; fatal cardiac arrhythmias with rapid, high-dose IV methylprednisolone administration; HF in susceptible patients
- **GI disturbances:** Pancreatitis, abdominal distention, ulcerative esophagitis, nausea, vomiting, increased appetite and weight gain, possible peptic ulcer or bowel perforation, hemorrhage
- **Dermatologic disturbances:** Impaired wound healing; thin, fragile skin; petechiae; ecchymoses; erythema; increased sweating; suppression of skin test reactions; subcutaneous fat atrophy; purpura; striae; hirsutism; acneiform eruptions; urticaria; angioneurotic edema; perianal itch
- **Neurologic disturbances:** Convulsions, increased intracranial pressure with papilledema (usually after treatment is discontinued), vertigo, headache, neuritis or paresthesia, steroid psychosis, insomnia
- **Endocrine disturbances:** Amenorrhea, other menstrual irregularities, development of cushingoid state, suppression of growth in children, secondary adrenocortical and pituitary unresponsive (particularly in times of stress), decreased carbohydrate tolerance, manifestation of latent diabetes mellitus, increased requirements for insulin or oral hypoglycemic agents (in diabetic patients)
- **Ophthalmic disturbances:** Posterior subcapsular cataracts, increased intraocular pressure, glaucoma, exophthalmos
- **Metabolic disturbances:** Negative nitrogen balance (due to protein catabolism)
- **Other disturbances:** Anaphylactoid or hypersensitivity reactions, aggravation of existing infections, malaise, increase or decrease in sperm motility and number

## Nursing management

- Never omit a dose of a glucocorticoid
- Patients with diabetes who are receiving a glucocorticoid may require frequent adjustment of their insulin or oral antidiabetic drug dosage. (Ford 476)
- Administration of the glucocorticoids poses the threat of adrenal gland insufficiency (Ford 476)
- Glucocorticoid therapy should never be discontinued suddenly (Ford 476)
- Take the drug exactly as directed in the prescription container. Do not increase, decrease, or omit a dose unless advised to do so by the primary health care provider.
- Take single daily doses before 9:00 a.m.
- Follow the instructions for tapering the dose, because they are extremely important.
- If the problem does not improve, contact the primary health care provider. (Ford 477)

Generic	Trade	Use	Route
Dexamethasone	Medrol, Depo-Medrol, Solu-Medrol	Endocrine disorders, rheumatoid disorders, collagen disease, dermatologic disorders, allergic state, ophthalmic disorders, respiratory disorders, hematologic disorders, neoplastic disease, edema, GI disease, Nervous system disorders	Individualize dosage based on severity of condition and response
Prednisone	None	Same as dexamethasone	Individualize dosage: initial dose usually between 5 and 60 mg/day orally

# Gonadotropins

## How do they work? "Action"

FSH and LH) influence the secretion of sex hormones, the development of secondary sex characteristics, and the reproductive cycle in both men and women.

## Indications

- **Gonadotropins** are used to induce ovulation and pregnancy in anovulatory women (women whose bodies fail to produce an ovum or fail to ovulate).
- **Human chorionic gonadotropin (HCG)** is extracted from human placentas. This drug is also used in boys to treat prepubertal cryptorchidism and in men to treat selected cases of hypogonadotropic hypogonadism. (Ford 469)
- **Follistim AQ** is used to induce sperm production (spermatogenesis). (Ford 469)
- **Clomiphene and ganirelix** are synthetic nonsteroidal compounds that bind to estrogen receptors. These drugs are used to induce ovulation in anovulatory (non ovulating) women. (Ford 469)

## Adverse Reactions

### Hormone-Associated Reactions

- Vasomotor flushes (which are like the hot flashes of menopause)
- Breast tenderness
- Abdominal discomfort, ovarian enlargement
- Hemoperitoneum (blood in the peritoneal cavity)

### Generalized Reactions

- Nausea, vomiting
- Headache, irritability, restlessness, fatigue
- Edema and irritation at the injection site (Ford 469)

## Interactions

- **None listed**

## Contraindications

- high gonadotropin levels
- thyroid dysfunction
- adrenal dysfunction
- liver disease
- abnormal bleeding, ovarian cysts, or sex hormone-dependent tumors,
- organic intracranial lesion (pituitary tumor). Gonadotropins are contraindicated during pregnancy (pregnancy category X). (Ford 469)

## Nursing management

- If the patient complains of visual disturbances, the drug therapy is discontinued and the primary health care provider notified. An examination by an ophthalmologist is usually indicated. (Ford 470)
- The patient is checked for signs of excessive ovarian enlargement (abdominal distention, pain, ascites [with serious cases]). The drug is discontinued at the first sign of ovarian stimulation or enlargement. The patient is usually admitted to the hospital for supportive measures. (Ford 470)

### HORMONAL OVARIAN STIMULANTS

- Before beginning therapy, be aware of the possibility of multiple births and birth defects.
- It is a good idea to use a calendar to track the treatment schedule and ovulation.
- Report bloating, abdominal pain, flushing, breast tenderness, and pain at the injection site.

### NON HORMONAL OVARIAN STIMULANTS

- Take the drug as prescribed (5 days) and do not stop taking the drug before the course of therapy is finished unless told to do so by the primary health care provider.
- Notify the primary health care provider if bloating, stomach or pelvic pain, jaundice, blurred vision, hot flashes, breast discomfort, headache, nausea, or vomiting occurs.
- Keep in mind that if ovulation does not occur after the first course of therapy, a second or third course may be used. If therapy does not succeed after three courses, the drug is considered unsuccessful and is discontinued.

Generic	Trade	Use	Dose
<b>Gonadotropin</b> • Gonadotropin ovarian stimulant	Bravelle, Follistim AQ, Gonal-f, Gonal-f RFF, Menopur, Repronex	Ovulation induction, multifollicular development, male infertility	Individualized dosing dependent on patient outcome
<b>Nafarelin</b> • Gonadotropin-releasing hormone/ synthetic	Synarel	Endometriosis, precocious puberty	400 mcg/day intranasally in 2 doses
<b>Cetrorelix</b> • Gonadotropin-Releasing Hormone Antagonists	Cetrotide	Infertility	Does individualized during cycle
<b>Clomiphene</b> • Nonsteroidal Ovarian Stimulant	Clomid, Serophene	Ovulatory failure	50 mg/day orally for 5 days, may be repeated

# Heart Failure

## Patho

**HF=HEART FAILURE** (failure to PUMP forward)  
**HF=HEAVY FLUID** (lungs & body)

## Memory Trick:

**S**=Sodium **S**wells  
**W**=Weight **G**ain = **W**ater Gain Crisis!

## Signs & Symptoms

**R-RIGHT** sided HF  
**R-ROCKS** the **BODY** with fluid  
 Peripheral Edema  
 Weight Gain = Water Gain  
 Edema (pitting)  
 JVD (big neck veins)  
 Abdominal Growth  
 Ascites  
 Hepatomegaly (big liver)  
 Splenomegaly (big spleen)

**L-LEFT** sided HF  
**L-LUNG** fluid  
**"Pulmonary Edema"**  
 Crackles "rales" that don't clear  
 with cough (**NOT** rhonchi or wheeze)  
 Frothy Pink "blood tinged" sputum  
 orthopnea-dyspnea while lying flat

## Causes

**R-RIGHT** sided HF  
 Left sided HF can cause Right HF  
 Pulmonary HTN  
 Fibrotic Lungs "stiff lungs"

**L-LEFT** sided HF  
 (weak heart = weak pump)  
 MI (heart attack)  
 Ischemic Heart Disease  
 (CAD, ACS)

## Treatment Priority

**KEY WORDS:** new, sudden, worsening, rapid =  
 Pulmonary Edema **CRISIS** (Lung Fluid!)

#1 Furosemide "Body Dried" (drain fluid)  
**H-HOB** 45 degrees + (semi fowlers, high fowlers, orthopneic position)  
**O-Oxygen**  
**P-Push** Furosemide + Morphine, **P**ositive inotropes  
**E-End** sodium & fluids (**Sodium Swells**)  
**NO** drinking fluids + **STOP** IV fluids

## Diagnostic tests

**Labs:** BNP—"Broken Venticles"

**300+ Mild • 600+ Moderate • 900+ SEVERE HF**

### Echo

Ejection Fraction 40% or LESS is HF! (normal-55-70%)  
 LVH=Left Ventricular Hypertrophy

**Hemodynamic Monitor** "Swan Ganz" (Pulmonary artery catheter)  
 CVP (norm: 2-8) Over 8 = NOT GREAT

## Risk Factors

#1 risk factor is HTN  
 ECG Dysrhythmias (Atrial Fibrillation)  
 Valvular Malfunction (mitral valve regurgitation)  
 Cardiomyopathy

## Nursing Care

### DR. BEDS

**D-Diet:** Low SCC (Sodium, Calories, Cholesterol)  
 Low Sodium & Fluid (2L + 2g or LESS/day)  
**NO** OTC meds (Cough or Flu, Antacids or NSAIDS **NCLEX TIP**)  
**NO** Canned or packaged foods (chips, sauces, meats, cheeses, wine)  
**R-Risk for Falls!** (Change positions slowly!)  
**B-Blood Pressure & BNP** (should NOT be increasing)  
**E-Elevate HOB & Legs** (with pillows) high fowlers  
**D-Daily Weights and Is and Os** (Over 3 lbs/day or 5 lbs in 7 days) = Worsening! **NCLEX TIP**  
**S-Stairs** (No sex until able to climb 2 flights of stairs without dyspnea)  
**S-Stocking** (TED hose) (decreases blood pooling, remove daily)  
**NEVER** massage calves (CHF patients) **NCLEX TIP**

## Pharmacology

**A-ACTS** on BP only (**not HR**)  
**A-ACE (-pril)** Lisinopril "chill pril" 1st choice  
**A-ARBS (-sartan)** Losartan "relax man" 2nd choice  
**A-Avoid** Pregnancy  
**A-Angioedema** (Airway Risk) \*only Ace  
**C-Cough** \*only Ace  
**E-Elevated K+** (normal 3.5-5.0)  
**B-BETA BLOCKERS (-lol)** Ateno**LOL** "LOL = LOW"  
 Blocks both BP & HR (**AVOID** Low HR & BP)  
 Caution: **HOLD IF:**  
**B-Bradycardia** (LESS than 60) & BP low (90/60)  
 only hold if the patient is in an acute exacerbation of CHF  
**B-Breathing problems** "wheezing" (Asthma, COPD)  
**B-Bad** for Heart Failure patients  
**B-Blood sugar** masking "hides S/S" (Diabetics)  
**C-CALCIUM CHANNEL BLOCKERS**  
 Calms BP & HR (AVOID Low HR & BP)  
 (Nifedipine)  
**-dipine** "declined BP & HR"  
**-amilipine** "chill heart"  
**D-DIURETICS** Drain Fluid  
**D-Drains** Fluid "Diurese" "Dried"  
**K+ Wasting**-Furosemide & Hydrochlorothiazide  
 (caution: Low K+, Eat melons, banana & green leafy)  
**K+ Sparing**-Spironolactone "Spare potassium"  
 (AVOID Salt Substitutes, melons & green leafy)  
**D-DILATORS** (Vasodilators)  
 Nitroglycerin, Isosorbide  
**Nitroglycerin** "Nitro = Pillow for heart"  
**Caution: NO** Viagra "**-afil**" Sildenafil = **DEATH!**  
 Nitro drip: **STOP** = Systolic BP below 90 or 30 mmHg Drop  
 Adverse effect:  
 HA= side effect  
 Low BP= adverse effect (SLOW position changes)  
**D-DIGOXIN** (Inotropic)  
 Digs for a DEEP contraction  
 Increased contractility  
**Apical Pulse** x 1 minute  
**Toxicity** (over 2.0) Vision changes, N/V **TEST TIP**  
**Potassium** 3.5 or less (higher r/f toxicity)

## Notes

# Anti-Coagulants Heparin

## Key Numbers for NCLEX

- **PTT: 46 - 70**
- **Antidote:**  
Protamine Sulfate



Be careful, NCLEX, will yty & trick you!  
NOT **INR** & NOT **PTT OVER 70!**



## Memory Trick:

“HePTT” the FROG

- **H** - Heparin
- **P** - Protamine Sulfate **Antidote**
- **PTT** - **46 - 70** Max range

H - HaPTT



## NCLEX MEMORY TRICK!



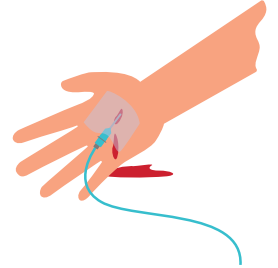
Heparin goes **FAST!!**



## ATI Question

Patient on Heparin with  
Bleeding at IV SITE!!  
Priority action:

**“Blood Oozing  
at surgical incision”**



## Priority Action:

**1**

**STOP** the Heparin - Notify HCP



**2**

Prepare Antidote: Protamine Sulfate



**3**

Reassess labs (1 hour)



## HESI Question

“Heparin drip  
PTT 85 or 100”

PTT **OVER 70 !!**

Heparin drip  
aPTT 85 or 100!



## Priority Action

**1**

**STOP** the Heparin  
- Notify HCP



**2**

Prepare Antidote:  
**Protamine Sulfate**




**3**

Reassess labs (**1 hour**)



## Notes

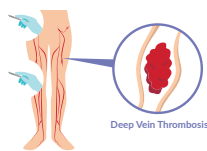
## KEY WORD



## PREVENTING GROWTH of existing clots



An illustration of a woman with dark hair, wearing a purple long-sleeved shirt, standing behind a light-colored desk. A magnifying glass is positioned over her chest, focusing on a detailed anatomical illustration of a human heart. The heart is shown in red and blue, with its major blood vessels. The magnifying glass has an orange frame and a black handle.



An illustration of a blue vial labeled 'Heparin' with a blue cap and a blue checkmark, next to a green clock face showing approximately 1:50.

- 
- Enoxaparin



- 



## “HePTT” the FROG

**H** – Heparin

**P** – Protamine Sulfate (Antidote)

**PTT - 46 - 70 Max range**

\*FAST onset = Frogs are FAST

## WAR



“War-K-IN”

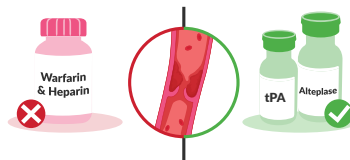
**W** – Warfarin

**K** – Vitamin K (Antidote)

**IN - INR 2 -3 range**

\*Slow onset = “Is it even WARkin?”

**Don't let  
NCLEX  
TRICK YOU**



A cartoon illustration of a white Warfarin bottle with a blue cap and a label that reads 'Warfarin'. Below the bottle is a green spiral-bound calendar showing a grid of dates, with several dates highlighted in blue.



©Stefanie Benton

# Herbal Supplements

## Bleed Risk:

E

Vitamin E



G

Ginger



G

Garlic



G

Ginkgo Biloba



G

Ginseng



O

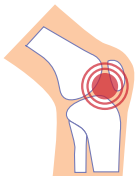
Omega 3



### JOINT

Glucosamine

WATCH for **hypoglycemia**  
when taking **anti-diabetic meds**



### ATI Question

Glucosamine  
= Treats **arthritic** pain

H



H



### Heart

H - Heart

H - Hawthorn extract

E



E



### Skin

E - Eczema/  
skin irritationsE - Evening  
Primrose

## All Supplements

### KEY POINTS

- **Assess for interactions** with clients  
other meds
- **PRIORITY!** Drug to drug  
interactions
- **STOP** 2 - 3 weeks before surgery

PRIORITY



2 - 3 weeks

Benign Prostate  
Hypertrophy

### Prostate

Saw Palmetto: TREATs BPH

SP - Saw Palmetto

SP - Swollen Prostate



### Menopause - "HOT FLASHES"

- **Black Cohosh**
- **Bad CoHOT** flash

S



S



Serotonin

S



### Mental - Depression & Insomnia

V - Valerian  
V - Valium effects

S - St. John Wort affects  
S - Serotonin - CAUTION  
- Serotonin syndrome!  
S - Stay away from  
Antidepressants !!

### KEY PRIORITY

DO NOT MIX!!!

1. Antidepressants SSRI's,  
MAOIs, TCAs
2. Serotonin Syndrome
  - Mild signs
    - Shivering/ Diarrheas
  - Severe signs
    - Muscle rigidity/ Fever
    - Seizures
    - Death



## Notes

# Histamine H2 Agonist

## - Acid Reducers

### How do they work? "Action"

Reduces the secretion of gastric acid by inhibiting the action of histamine at H2 receptor cells of the stomach.

### Interactions:

- **Antacids and metoclopramide:** Decreased absorption of the H2 antagonists
- **Carmustine:** Decreased white blood cell count
- **Opioid analgesics:** Increased risk of respiratory depression
- **Oral anticoagulants:** Increased risk of bleeding
- **Digoxin:** May decrease serum digoxin levels

### Why are they used for? "Indications"

- Heartburn, acid indigestion, and sour stomach (frequently sold as over-the-counter remedies)
- GERD
- Gastric or duodenal ulcer
- Gastric hypersecretory conditions (excessive gastric secretion of HCl)

### Nursing management

- Because of the possibility of an antacid interfering with the activity of other oral drugs, no oral drug should be administered within 1 to 2 hours of an antacid.
- When one of these drugs is given IV, monitor the rate of infusion at frequent intervals. Too rapid an infusion may induce cardiac arrhythmias.
- Keep a record of the patient's bowel movements, because these drugs may cause constipation or diarrhea.
- Observe the patient for signs of dehydration, which include poor skin turgor, dry mucous membranes, decrease in or absence of urinary output, concentrated urine, restlessness, irritability, increased respiratory rate, and confusion.
- Instruct the patient to chew the tablets thoroughly before swallowing and then drink a full glass of water or milk.
- Magnesium-containing products may produce a laxative effect and may cause diarrhea; aluminum- or calcium-containing antacids may cause constipation.
- Taking too much antacid may cause the stomach to secrete excess stomach acid. Consult the primary health care provider or pharmacist about appropriate dose. Do not use the maximum dose for more than 2 weeks, except under the supervision of a primary health care provider.

### Adverse effects

- Dizziness, somnolence, headache
- Confusion, hallucinations, diarrhea, and reversible impotence

### Contraindications

- Hypersensitivity

### Caution

- Renal or hepatic impairment
- In severely ill, older, or debilitated patients.
- Cimetidine is used cautiously in patients with diabetes. Histamine H2 antagonists are pregnancy category B (cimetidine, famotidine, and ranitidine) and C (nizatidine) drugs and should be used with caution during pregnancy and lactation.

### Hint!

- Look for similarities such as uses and suffixes
- Meds that end in \* Dine are H2 antagonists

Generic	Trade	Use	Dose
<b>Cimetidine</b>	Tagamet	Gastric/duodenal ulcers, GERD, gastric hypersecretory conditions, GI bleeding, heartburn	800–1600 mg/day orally; 300 mg q 6 hr IM or IV
<b>Famotidine</b>	Pepcid	Gastric/duodenal ulcers, GERD, gastric hypersecretory conditions, GI bleeding, heartburn	20–40 mg orally; IV if unable to take orally
<b>Ranitidine</b>	Zantac	Gastric/duodenal ulcers, GERD, gastric hypersecretory conditions, GI bleeding, heartburn	150–600 mg orally in one dose or divided doses orally; 50 mg q 6–8 hr IM, IV (do not exceed 400 mg/day)

# Immunosuppressants

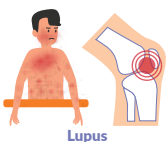
## Drug name:

**Hydroxychloroquine**



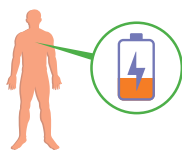
## Indication:

Treat autoimmune diseases where the body is attacking itself



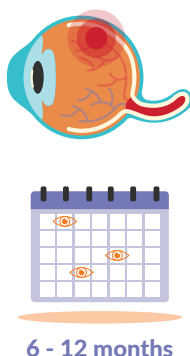
## MOA:

Increased energy levels  
NOT decreased



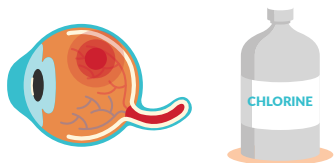
## KEY POINT

**Major Adverse Effects:**  
Retinal damage & vision problems  
Teach: Regular eye appt.  
Every **6 -12 months**



## MEMORY TRICK

**Hyyy-dddroxy Chloroquine**  
"Eyyye Damage Clorine"



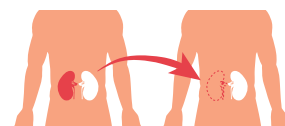
## Drug name:

**Cyclosporine / Azathioprine**



## Indication:

Prevent organ transplant rejection



## MEMORY TRICK

Cyclo-Sporine



CycloSPARIN



Sparing the organ  
from rejection

## KEY POINT | ADVERSE EFFECT

**BEFORE giving**  
- Check WBC + Plts  
• **REPORT** leukopenia  
Low WBC < 4000  
• **Monitor for bleeding**  
• **No** pregnant patients -  
Use Contraception

## KEY POINT

Common Side Effect  
**Cyclosporine**  
Gingival hyperplasia



## ATI

Notify provider for  
**any sign of infection**



## HESI

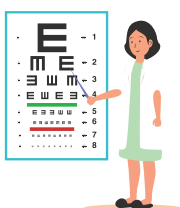
Teaching - **Cyclosporine & Azathioprine**

- Avoid crowds
- No live vaccines (Herpes Zoster + Shingles)
- Soft bristled toothbrush
- Use contraception

## HESI Question

Teaching is effective when the client states

"I need to see my **optometrist**  
**at least** once a year"



## KAPLAN

Patient statement that requires further teaching

- "I will mix **cyclosporine** with grapefruit juice"

**Cyclosporine teaching:** Organ transplant

- Take med for life
- HCP will eval blood work regularly
- Take med at same time everyday



## Notes

# Diabetes Drugs

## - Incretin Mimetics

### How do they work? "Action"

Hormone mimetic agents help control blood glucose levels by maintaining  $\beta$  cell function of the pancreas, enhancing insulin secretion, and suppressing glucagon, which signals the liver to decrease release of glucose. Gastric emptying is also delayed, which slows carbohydrate absorption.

**Sitagliptin (Januvia)** lowers the blood glucose level of those with type 2 diabetes by enhancing the secretion of the endogenous incretin hormone.

**Exenatide (Byetta)** mimics the action of the incretin hormone. Pramlintide (Symlin) mimics the action of another secretion, amylin.

### Indications

Oral antidiabetic drugs are used in the treatment of patients with type 2 diabetes mellitus whose condition cannot be controlled by diet alone. (Ford 452)

### Adverse Reactions

- nausea
- vomiting
- upset stomach
- diarrhea
- constipation
- weight loss
- loss of appetite
- heartburn
- dizziness
- headache

### Contraindications & Caution

- Type 1 diabetes mellitus
- Diabetic ketoacidosis
- Kidney disease
- Pregnancy

### Interactions:

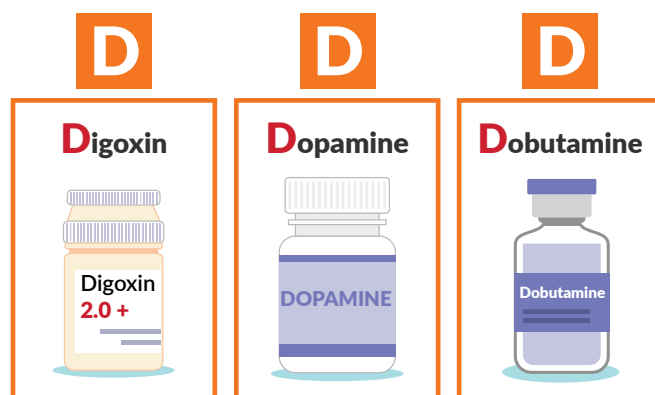
- May slightly increase serum digoxin levels. Monitoring recommended.
- Increased risk of hypoglycemia when used with insulin, glyburide, glipizide, or glimepiride (may need to increase dose of insulin or sulfonylurea).

### Nursing management

- Observe patient for signs and symptoms of hypoglycemic reactions (abdominal pain, sweating, hunger, weakness, dizziness, headache, tremor, tachycardia, anxiety).
- Monitor for signs of pancreatitis (nausea, vomiting, anorexia, persistent severe abdominal pain, sometimes radiating to the back) during therapy. If pancreatitis occurs, discontinue sitagliptin and monitor serum and urine amylase, amylase/creatinine clearance ratio, electrolytes, serum calcium, glucose, and lipase.
- Assess for rash periodically during therapy.
- Advise patient to stop taking sitagliptin and notify health care professional promptly if symptoms of hypersensitivity reactions (rash; hives; swelling of face, lips, tongue, and throat; difficulty in breathing or swallowing) or pancreatitis occur.

Generic	Trade	Safe Dose	Route
Sitagliptin	Januvia	Type 2 Diabetes	100 mg orally daily
Exenatide	Byetta	Type 2 Diabetes	5-10 mcg sub q within one hour of a meal
Liraglutide	Victoza	Type 2 diabetes	0.6-1.2 mg subq daily

# Inotropic, Chronotropic, Dromotropic

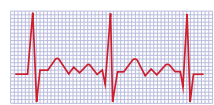
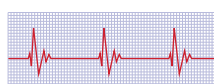


## INotropic

“**IN**creased cardiac contractility”  
“**IN**creased forceful contraction”

3 Ds for DEEP contraction

- D - Digoxin
- D - Dopamine
- D - Dobutamine



## Chronos

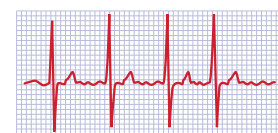
Clock

- Neg. Chronos - Neg time
- Positive Chronos - Positive time
- Faster HR - Positive Chronotropic
- Lower HR - Negative Chronotropic

## Dromo

Drums

- Neg. Dromotropic - stable heart rhythm



Drug	Inotropic Force of Heartbeat	Chronotropic Rate of Heartbeat	Dromotropic Rhythm of Heartbeat
<b>A</b> amiodarone	+ Pos.	- Neg.	- Neg.
<b>B</b> beta blockers Atenolol	- Neg.	- Neg.	- Neg.
<b>C</b> calcium CB	- Neg.	- Neg.	- Neg.
<b>C</b> cardiac glycosides Digoxin	+ Pos.	- Neg.	- Neg.
<b>D</b> dobutamine	+ Pos.	X	X
<b>D</b> dopamine	+ Pos.	+ Pos.	X
<b>E</b> epinephrine	+ Pos.	+ Pos.	X

## PATHOPHYSIOLOGY BASICS

**IN**sulin = puts **IN** to the cell (sugar & K+)  
**GL**ycogen = Stored **GL**ucose in Liver



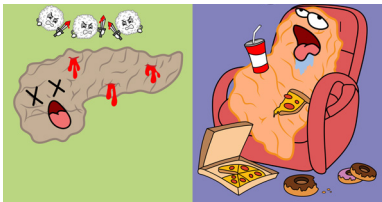
## PATHO & CAUSES

### Type **ONE**

**DON**'t-produce insulin (Born)  
 Autoimmune "body attacks itself"  
**SON**-hereditary

### Type **TWO**

**FEW**-insulin receptors work  
 "Insulin resistance" (Diet)  
**YOU**-diet "high simple sugars"  
 & sedentary lifestyle



## RISK FACTORS

Type **ONE** -None (born)

Type **TWO**

"Meta**BOLIC** Syndrome"-Increased risk for diabetes, heart disease, stroke

**B**-BP meds or HTN (over 130 sysolic)

**B**-Blood Sugar Meds (insulin, oral diabetics) or High Blood Sugar (over 100+)

**O**-Obese (waist size: 35+ Female 45+ Male)

**L**-Lipids HIGH Total Cholesterol/Triglyceride/LDL 200-150-100-HDL 40  
 (higher LDL and lower HDL are risk factors)

\*3 or MORE criteria\*

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# DIABETES MELLITUS

## TYPE 1 vs. TYPE 2

## DIAGNOSTIC LABS

	RANDOM	FASTING	GTT "TOLERANCE"	HgB <sub>A1C</sub>
NORMAL	70-115	UNDER 100	UNDER 140	UNDER 5.7
PRE-DM	X	100-125	140-199	5.7-6.4
DM	200+	126+	200+	6.5+



## SIGNS & SYMPTOMS

**HIGH** sugar  
 hot and dry = sugar high  
 "Hyperglycemia"  
 (blood turns to mud)  
 3 P's: Polyuria  
 Polydipsia  
 Polyphagia

**LOW** sugar (**70** or LESS)  
 cold and clammy need some candy  
 Hypoglycemia  
**MORE SEVERE!** "Hypogly Brain will Die!"  
 · Cool, pale "pallor", sweaty,  
 clammy = candy **NOT** hot or flushing  
 · Trembling, Nervous, Anxious  
 · HIWASH = Headache, Irritable, Weakness,  
 Anxious, Sweaty, Shaky, Hungry

## CAUSES

**HIGH** sugar (115 or MORE)  
 Sepsis (infection #1 cause),  
 Stress (surgery, hospital stay),  
 Skip insulin  
 Steroids (prednisONE)  
**TREATMENT:** Insulin



**LOW** sugar (**70** or LESS)  
 Exercise  
 Alcohol  
 Insulin PEAK times  
**MOST DEADLY!** "Hypogly brain will DIE!"  
**1st TREATMENT:**  
 Awake? Ask to eat:  
 Juice, Soda, Crackers, Low Fat Milk  
**NOT** high fat milk or peanut butter  
 Sleep? S tab them (D50 given IV/IO)



## TREATMENT—PATIENT EDUCATION

### D-DIET -Low carbs

**AVOID:** Simple Sugars (soda, candy, white bread/rice, juices)  
 · Good High Fiber = BROWN (bean, rice, bead, peanut butter)  
 "whole wheat/grain/milk"  
 · Bad Low fiber = White (bread, rice, bread potatoes (fries), low fat milk)

### D-DIABETIC FEET "Delicious Feast for bacteria"

**GOAL:** Clean, Dry, Injury Free

#### AVOID

**F**-Flip Flops, high heels, Nylon,  
**O**-OTC corn removal  
**O**-Overly **HOT** (baths, pads etc.)  
**T**-Toe Injuries — cut nails STRAIGHT



#### NCLEX KEY WORDS:

Daily inspection — **NOT** weekly  
 Shoes fit properly — **NO** sandals  
**SOFT** Cotton Socks — **NOT** nylon  
 Nails trimmed-cut straight — **NOT** curved angles  
 Non healing skin wounds — Report to HCP (Dr.)  
**NO** callous removal  
**NO** heavy Powder — light powder  
**NO** rubbing feet hard "vigorously"  
**NO** HOT baths or HOT pads — warm is ok

## COMPLICATIONS

**KIDNEY**-Nephropathy (High Creatinine OVER 1.3)

**EYE**-Retinopathy (blind)

**HEART**-HTN & Atherosclerosis






**BRAIN**-CVA (strokes)

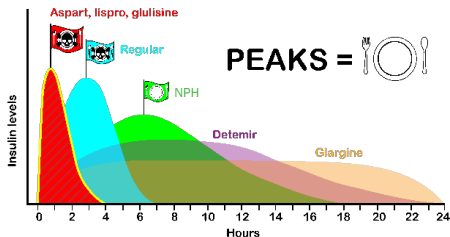
**NERVES**-Neuropathy (loss of feeling)



## NOTES

## INSULIN TYPES

LONG ACTING	NPH	REGULAR	RAPID
<b>NO Peak</b> <b>NO Mix</b> • Detemir • Glargine • Levemir= Long acting	Intermediate <b>NEVER</b> IV drip or IV bag Mix clear to cloudy Given 2x per day	Ready to go IV Regular goes right into the vein <b>ONLY</b> IV insulin	Aspart/Lispro/ Glulisine
 <b>NO PEAK</b>	 <b>PEAK</b> 4-12 hour	 <b>PEAK</b> 2-4 hour	 <b>PEAK</b> 30-90 minute 15 minute <b>ONSET</b> <b>MOST DEADLY</b> 



**PEAK TIMES**=Hypoglycemia risk **70 or Less**  
 Hypogly brain will **DIE NCLEX TIP**

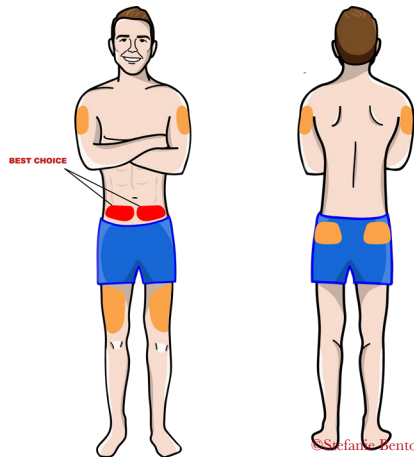
## ORAL HYPOGLYCEMICS (Type 2 Only)

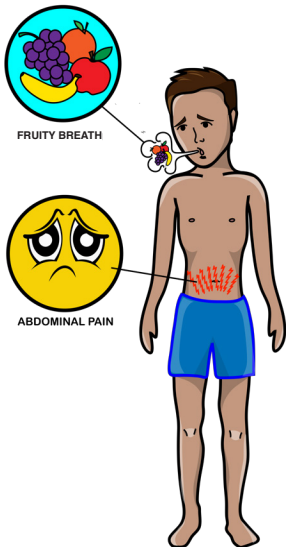
- DIET & EXERCISE** BEFORE oral meds and insulin
- METFORMIN**-Minimal chance of Low Sugar "hypoglycemia"
  - Weight **GAIN**
  - Lactic Acidosis: **NO** Alcohol + **STOP** 48 hours before and after cath  
 IV Contrast = Kills Kidney
- GLIPIZIDE GLYBURIDE**-Heart can **DIE** (bad for CHF)  
**LOW** blood sugar (Avoid alcohol "**ETOH**" = hypoglycemia)  
**TOXIC:** Renal, Liver & elderly population  
 Sun Burns = sunscreen & protective clothing
- THIAZOLIDINEDONE (TZD)** Pioglitazone (**ONE** heart)  
**NO** Heart Failure patients-new pitting edema, crackles (lungs)  
**NO** Liver failure patients "Cirrhosis" "Liver Failure"

## NOTES

## 7 INSULIN TIPS

- Peaks + Plates** = Food during **PEAK** times (prevent **HYPO**gly-brain die)
- NO Peak NO Mix** = Long acting "old guys"-Detemir & Glargine
- IVP or IVPB ONLY** = Regular insulin "ready to go IV"
- Draw Up:** Clear to Cloudy "you want **CLEAR** days before cloudy ones"
- Rotate locations-Macarena-**BEST** on abdomen  
 (2 inches from: Umbilicus, Naval, "belly button")
- DKA** - Type 1-"sick days"-**YES INSULIN** without food!!!
- Hypoglycemia (**70** or LESS)  
**Awake** = Ask them to Eat (soda, juice, low fat milk)  
**Sleeping** = Stab with IV D50 (dextrose 50)  
 "Unresponsive" "Responsive ONLY to pain"





## DKA

### PATHO & CAUSES:

**TYPE 1**—Faster & Younger “D comes 1st in alphabet”

- S**-Sepsis (infection) **NCLEX TIP**
- S**-Sickness “Stomach Virus & Flu” (most common)
- S**-Stress (surgery)
- S**-Skip insulin Easier fix

### SIGNS & SYMPTOMS:

- D**-Dry & High sugar **250—500+**
- K**-Ketones & Kussmaul resp. (Deep/rapid/REGULAR respirations and fruity breath)
- A**-Abdominal Pain
- A**-Acidosis Metabolic **LESS than 7.35** (normal 7.35—7.45)  
Hyperkalemia (Abnormally high K+)

### TREATMENT:

- D**-Dehydration **FIRST!** (0.9% normal saline)
- K**-Kill the sugar (**SLOWLY**) prevent low sugar  
 \*Hourly BS checks\* “land the plane slow & smooth”  
**Over 250:** IV Regular **insulin ONLY** (bolus 1st)  
**Below 200** (or ketones resolve): SQ insulin + 1/2 NS with D5W IV
- A**-Add Potassium K+ (Yes even if norm: 3.5 - 5.0)  
**During IV Insulin**  
**IN**-sulin = sugar & K+ IN the cell

## HHNS

### PATHO & CAUSES:

**TYPE 2**—slower & older “H comes 2nd in alphabet”

- Illness
- Infections
- Older age Harder to fix

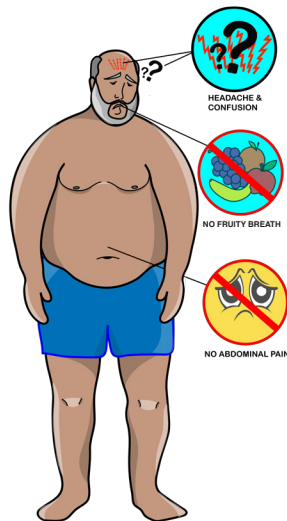
### SIGNS & SYMPTOMS:

- H**-**HIGHEST SUGAR OVER—600+**
- H**-**HIGHER** fluid loss & **Extreme dehydration NCLEX TIP**
- H**-Head change-LOC, Confusion, Neurological Manifestations
- N**-No ketones **No Acid**, (NO fruity breath/ketones)
- S**-Slower Onset & Stable Potassium (3.5-5.0)

### TREATMENT:

- H**-Hydration-0.9% NS 1st, then **HYPOTONIC NCLEX TIP**
- S**-Stabilize Sugars (Insulin)
- CAUTION:** Insulin IV = **ONLY Regular Insulin**
  - IV bolus
  - IV titration
  - SQ injection & IV
  - SQ only

**DKA patients DIE** from hypokalemia where  
**HHNS patients die** from hypovolemia



### COMMON NCLEX QUESTION

**Q:** Child is nauseous **NOT** eating—maybe vomiting—do you still give **INSULIN**?

**A:** Yes, we give sick day insulin to prevent DKA...because glucose is **HIGH** during times of illness.

### RE-ASSESSMENT

Blood Glucose **Hourly**

Re-Hydration Signs:

- BP stable & Cap Refill (3 sec or less)
- Skin color & warm temp (NOT cool/pale)
- 30ml/hr + Urine Output
- Low spec gravity (1.005–1.030)

**NOT** Apical pulse **NOT** Lung sounds **NOT** Pupils

### Potassium IV (Normal 3.5 - 5.0)

- First Action = Heart monitor  
Never push = **DEATH**
- 10–20 mg MAX per hour IV!! (IV Pump)
- Site (central) and **Slow** infusion

### POTASSIUM PUMPS MUSCLES

**High** Potassium (5.0+)

**High** Pump

Peaked T waves, ST elevation

**Low** Potassium (Below 3.5)

**Low** Pump

Flat T wave, ST depression, U wave



### NOTES

# Diabetes Drugs - Insulin

## How it works? "Action"

Activates a process that allows glucose molecules to enter the cell "Thick of it like a Key opening a door, the cell is the door. The insulin is the key"

**Onset, peak, and duration are three important properties of insulin:**

- **Onset:** when insulin first begins to act in the body
- **Peak:** when the insulin is exerting maximum action
- **Duration:** the length of time the insulin remains in effect

## Indications

Insulin is used to:

- Control type 1 diabetes
- Control type 2 diabetes when uncontrolled by diet, exercise, or weight reduction
- Treat severe diabetic ketoacidosis (DKA) or diabetic coma
- Treat hyperkalemia in combination with glucose

## Adverse Reactions

### Hypoglycemia

- The patient eats too little food.
- The insulin dose is incorrectly measured and is greater than that prescribed.
- The patient has drastically increased demands (activity or illness).

### Hyperglycemia

- The patient eats too much food.
- Too little or no insulin is given.
- The patient experiences emotional stress, infection, surgery, pregnancy, or an acute illness.

## Nursing management

- Obtain FSBS before administration of any insulin.
- Obtain FSBS 30 minutes post insulin administration.
- Educate the patient how to self administer insulin and signs of symptoms of hyper/hypoglycemia.
- Monitor for hypoglycemia
- Monitor for hyperglycemia
- Monitor potassium levels
- Regular insulin is clear, whereas intermediate- and long-acting insulins are cloudy. The clear insulin should be drawn up first. When insulin lispro is mixed with a longer-acting insulin, the insulin lispro is drawn up first. (Ford 456)

## Contraindications & Caution

Specific insulin products are contraindicated when the patient is hypoglycemic. Insulin is used cautiously in patients with renal or hepatic impairment and during pregnancy and lactation. The insulins are grouped in pregnancy category B, except for insulin glargine and insulin aspart, which are in pregnancy category C. Insulin appears to inhibit milk production in lactating women and could interfere with breastfeeding. Lactating women may require adjustment in insulin dose and diet. (Ford 451)

## Interactions:

**Eucalyptus products:** May cause decreased blood sugar.

**Drugs That Increase the Effect (Less Insulin May Be Required)** • angiotensin-converting enzyme (ACE) inhibitors, alcohol

- anabolic steroids, antidiabetic drugs, oral,  $\beta$ -blocking drugs
- Calcium, clonidine, disopyramide, fluoxetine, fibrates, lithium
- MAOIs, mebendazole, pentamidine, pentoxifylline, Pyridoxine, salicylates, somatostatin analog, sulfonamides, tetracycline

**Selected Drugs That Decrease the Effect (More Insulin May Be Required)**

- Acetazolamide, albuterol, antipsychotics (atypical or second generation)
- Asparaginase, calcitonin, contraceptives, oral corticosteroids
- Cyclophosphamide, danazol, diltiazem, diuretics, dobutamine
- Epinephrine, estrogens, glucagon, human immunodeficiency virus (HIV) antivirals
- Isoniazid, lithium, morphine sulfate, niacin, nicotine, phenothiazines, phenytoin, progestogens, protease inhibitors, somatropin, terbutaline, thiazide diuretics, thyroid hormones

## Types of Insulins

## Names

Rapid-Acting	insulin Lispro-Humalog Insulin Aspart-Novolog
Short-Acting	Regular Insulin-Humulin R • Regular insulin is the only one given IV • Concentrated insulin-Insulin U-500
Intermediate-Acting	NPH-Humulin N, Novolin R
Long-Acting	Insulin Glargine-Lantus • Cannot mix with others Insulin Detemir-Levemir
Premixed	NPH/REG • Humulin 50/50 • Humulin 70/30 • Novolin 70/30 <b>Aspart protamine/aspart</b> • Novolog Mix 70/30 <b>Lispro protamine/lispro</b> • Humalog Mix 75/25

Generic	Trade	Safe Dose	Route
Lispro (Humalog)	5m	60-90min	4-6h
Aspart (Novolog)	10-20m	1-3h	3-5h
Regular (Humulin R)	SQ: 30-60m IV: 10-30m	SQ: 2-4h IV: 15-30m	SQ: 5-7h IV: 30-60m
NPH (Humulin N, Novolin R)	8-12h	18-24h	None
Glargine (Lantus)	None	None	24h
Detemir (Levemir)	3-14h	None	24h

# TB Drugs:

## Isoniazid

### How do they work? "Action"

Many antitubercular drugs are bacteriostatic against the M. tuberculosis bacillus. These drugs usually act to inhibit bacterial cell wall synthesis, which slows the multiplication rate of the bacteria. Isoniazid is bactericidal, with rifampin and streptomycin having some bactericidal activity.

### Indications

- Treatment of TB in a protocol

### Adverse reactions

- Peripheral neuropathy With toxicity
- Severe hepatitis
- Nausea and vomiting
- Epigastric distress
- Fever
- Skin eruptions
- Hematologic changes
- Jaundice
- Hypersensitivity

### Contraindications & Caution

Isoniazid is contraindicated in patients with a history of hypersensitivity to the drug. The drug is used with caution during pregnancy (category C) or lactation and in patients with hepatic and renal impairment. (Ford 105)

### Nursing alert

- Isoniazid is taken with foods containing tyramine, such as aged cheese and meats, bananas, yeast products, and alcohol, an exaggerated sympathetic-type response can occur (i.e., hypertension, increased heart rate, and palpitations). (Ford 105)
- Older adults are particularly susceptible to a potentially fatal hepatitis when taking isoniazid, especially if they consume alcohol on a regular basis.

### Nursing management

- Ask the patient what he or she thinks causes the symptoms; promote health literacy by integrating the patient's beliefs and fears into how the bacteria invades the body and how the drugs work to kill it.
- Discuss tuberculosis, its causes and communicability, and the need for long-term therapy for disease control using simple, non medical terms.
- Review the drug therapy regimen, including the prescribed drugs, doses, and frequency of administration.
- Reassure the patient that various combinations of drugs are effective in treating tuberculosis.
- Urge the patient to take the drugs exactly as prescribed and not to omit, increase, or decrease the dosage unless directed to do so by the health care provider.
- Instruct the patient about possible adverse reactions and the need to notify the prescriber should any occur.
- Arrange for direct observation therapy with the patient and family.
- Instruct the patient in measures to minimize gastrointestinal upset.
- Advise the patient to avoid alcohol and the use of nonprescription drugs, especially those containing aspirin, unless use is approved by the health care provider.
- Reassure the patient and family that the results of therapy will be monitored by periodic laboratory and diagnostic tests and follow-up visits with the health care provider.

### Interactions

- **Antacids containing aluminum salts:** Reduced absorption of isoniazid
- **Anticoagulants:** Increased risk for bleeding
- **Phenytoin:** Increased serum levels of phenytoin
- **Alcohol (in beverages):** Higher incidence of drug-related hepatitis

#### Generic

Isoniazid  
Primary  
treatment

#### Trade

NA

#### Use

Active TB; prophylaxis for TB

#### Dose

Active TB: 5 mg/kg (up to 300 mg/day) orally or 15 mg/kg 2-3 times weekly

# Immunologic Agents

## - IG & Antivenin

### What do they do?

**Immune globulins** are solutions obtained from human or animal blood containing antibodies that have been formed by the body to specific antigens. Because they contain ready-made antibodies, they are given for passive immunity against disease. **Antivenins** are used for passive, transient protection from the toxic effects of bites by spiders (black widow and similar spiders) and snakes (rattlesnakes, copperhead and cottonmouth, and coral). The most effective response is obtained when the drug is administered within 4 hours after exposure.

### Interactions

Antibodies in the immune globulin preparations may interfere with the immune response to live virus vaccines, particularly measles, but including others such as mumps and rubella. It is recommended that the live virus vaccines be administered 14 to 30 days before or 6 to 12 weeks after administration of immune globulins. No known interactions have been reported with antivenins.

### Contraindications

The immune globulins are contraindicated in patients with a history of allergic reactions after administration of human immunoglobulin preparations and in individuals with isolated immunoglobulin A (IgA) deficiency (individuals could have an anaphylactic reaction to subsequent administration of blood products that contain IgA).

Human immune globulin intravenous (IGIV) products have been associated with renal impairment, acute renal failure, osmotic nephrosis, and death. Individuals with a predisposition to acute renal failure (e.g., those with pre-existing renal disease), those with diabetes mellitus, individuals older than 65 years of age, or patients receiving nephrotoxic drugs should not be given human IGIV products.

### Notes

# Labor Drugs

## Drug name:

Terbutaline



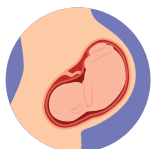
## Indication:

Delays labor momentarily by suppressing contractions



## Memory Trick

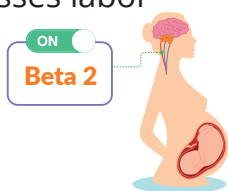
Turbuta**LINE**



Wait in **LINE** for the baby & Terbutaline slows down Turbulent contractions

## MOA:

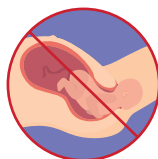
Activated beta 2 receptors to activate the sympathetic nervous system, which suppresses labor



## HESI Question

Terbutaline

- May be used for **48 hours to suppress** preterm labor



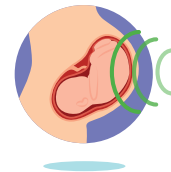
## Drug name:

Oxytocin



## Indication:

Induces labor & stimulates contractions

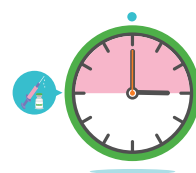


## Nursing Care:

## HESI Question

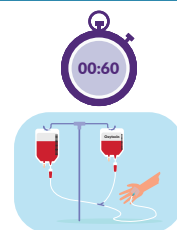
### Oxytocin

- Used to **stimulate uterine contractions**
- Administered **6 - 12 hours after last dose** of dinoprostone



## HESI Question

- Discontinue if contractions last **longer than 60 seconds**
- Maintain one on one care
- Piggyback** the oxytocin into the main IV fluids



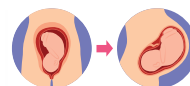
## KAPLAN Question

- Stop oxytocin infusion for contractions sustained **over 2minutes**
- Priority action** for 3 consecutive **late decelerations** = Turn off Oxytocin



## ATI Question

Turn the client **to the side** if **late decelerations** are noted.



## Notes

# Lactulose & Sodium Polystyrene Sulfonate

## Lactulose

### LAC

- **L** - Laxative for
- **A** - Ammonia levels-decrease
- **C** - Cognition returns  
"improved mental status"

Given to decrease ammonia levels in Cirrhosis patients, to treat **hepatic encephalopathy** (cloudy brain)

### Memory Trick:

Lacto - **LOSE**

Ammonia

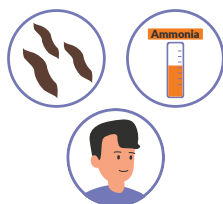


"Lose ammonia via Loose bowels"

### Key Points:

#### KEY POINTS:

- 2 - 3 soft stools per day
- Ammonia levels decrease
- Cognition improved  
"Improved mental status" **NCLEX TIP**

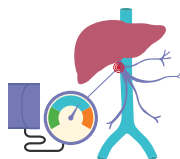


### NOT a Diuretic

**NO**  
renal excretion of ammonia



**NO**  
it **does not** decrease portal HTN



**NO**  
Abdominal distention will not improve with lactulose

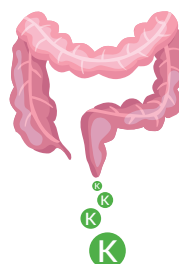
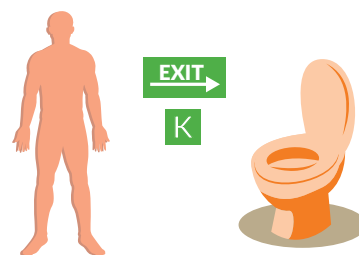


## Sodium Polystyrene Sulfonate

Given to decrease HIGH potassium (over 5.0)

### Memory Trick:

Kayexalate - helps K<sup>+</sup> to Exit the body



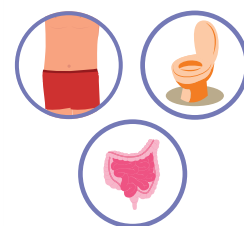
#### KEY WORDS

- Helps the large intestine to remove excess K<sup>+</sup> within the body

### Key Points:

#### KEY POINTS

- **Assess the Abdomen**
- Recent bowel patterns & frequency of stools
- Bowel Function
- Potassium (K<sup>+</sup>) within normal limits (3.5-5.0 mEq/L)



### HESI Question

#### Sodium Polystyrene

Encourage patient to **drink fluids after administration**



## Notes

# Laxatives

## How do they work? "Action"

There are many forms of laxatives, but the main goal is to relieve constipation.

## Why are they used for? "Indications"

- Stimulant, emollient, and saline laxatives—evacuate the colon for rectal and bowel examinations
- Stool softeners or mineral oil—prevention of strain during defecation (after anorectal surgery or a myocardial infarction)
- Psyllium and polycarbophil—irritable bowel syndrome and diverticular disease
- Hyperosmotic (lactulose) agents—reduction of blood ammonia levels in hepatic encephalopathy

## Adverse Reactions

- Constipation
- Diarrhea and a loss of water and electrolytes
- Abdominal pain or discomfort, nausea, vomiting, perianal irritation, fainting, bloating, flatulence, cramps, and weakness.
- Prolonged use of a laxative can result in serious electrolyte imbalances, as well as the "laxative habit", that is, dependence on a laxative to have a bowel movement.
- Some of these products contain tartrazine (a yellow food dye), which may cause allergic-type reactions (including bronchial asthma) in susceptible individuals. Obstruction of the esophagus, stomach, small intestine, and colon has occurred when bulk-forming laxatives are administered without adequate fluid intake or in patients with intestinal stenosis.

## Interactions

- Mineral oil may impair the GI absorption of fat-soluble vitamins (A, D, E, and K).
- Laxatives may reduce absorption of other drugs present in the GI tract by combining with them chemically or hastening their passage through the intestinal tract.
- When surfactants are administered with mineral oil, they may increase mineral oil absorption.
- Milk, antacids, histamine H<sub>2</sub> antagonists, and proton pump inhibitors should not be administered 1 to 2 hours before bisacodyl tablets because the enteric coating may dissolve early (before reaching the intestinal tract), resulting in gastric lining irritation or dyspepsia and decreasing the laxative effect of the drug.

## Contraindications

- Known hypersensitivity
- Persistent abdominal pain
- Nausea or vomiting of unknown cause
- Signs of acute appendicitis

## Caution

Magnesium: Used cautiously in any degree of renal impairment

## Nursing management

- Avoid long-term use of these products unless use of the product has been recommended by the primary health care provider. Long-term use may result in the "laxative habit," which is dependence on a laxative to have a normal bowel movement. Constipation may also occur with overuse of these drugs. Laxatives are not to be used for weight loss. Read and follow the directions on the label.
- Do not use these products in the presence of abdominal pain, nausea, or vomiting.
- Notify the primary health care provider if constipation is not relieved or if rectal bleeding or other symptoms occur.
- To avoid constipation, drink plenty of fluids, get exercise, and eat foods high in bulk or roughage. Cascara sagrada or senna—Pink-red, red-violet, red-brown, yellow-brown, or black discoloration of urine may occur. (Ford 440)

## Types

- Bulk-producing laxatives are not digested by the body and therefore add bulk and water to the contents of the intestines. The added bulk in the intestines stimulates peristalsis, moves the products of digestion through the intestine, and encourages evacuation of the stool. Sometimes these laxatives are used with severe diarrhea to add bulk to the watery bowel contents and slow transit through the bowel. Psyllium "Metamucil"
- Emollient laxatives lubricate the intestinal walls and soften the stool, thereby enhancing passage of fecal material. Mineral oil
- Stool softeners promote water retention in the fecal mass and soften the stool. One difference between emollient laxatives and stool softeners is that the emollient laxatives do not promote the retention of water in the stool. Docusate
- Hyperosmolar drugs dehydrate local tissues, which causes irritation and increased peristalsis, with consequent evacuation of the fecal mass. Glycerine or lactulose
- Irritant or stimulant laxatives increase peristalsis by direct action on the intestine. Cascara sagrada
- Saline laxatives attract or pull water into the intestine, thereby increasing pressure in the intestine, followed by an increase in peristalsis. Magnesium preparations

# Anti Infectives

## - Lincosamides

### How do they work? "Action"

They act by inhibiting protein synthesis in susceptible bacteria, causing cell death. They disrupt the functional ability of the ribosomes (which assemble amino acids in the cell), causing cell death.

### Indications

Treatment of infections caused by a range of gram-negative and gram-positive microorganisms. Lincosamides are used for the more serious infections and may be used in conjunction with other antibiotics. (Ford 87)

### Adverse Reactions

- Abdominal pain
- Esophagitis
- Nausea
- Vomiting
- Diarrhea
- Skin rash
- Blood dyscrasias
- Pseudomembranous colitis

### Contraindications & Caution

- Hypersensitive to the lincosamides
- Taking cisapride (Propulsid) or the antipsychotic drug pimozide (Orap)
- With minor bacterial or viral infections

### Nursing management

- Before administering any antibiotic be sure to evaluate the results of the culture and sensitivity test.
- Complete the entire course of treatment. Do not stop the drug, except on the advice of a primary health care provider, before the course of treatment is completed, even if symptoms improve or disappear. Failure to complete the prescribed course of treatment may result in a return of the infection.
- Evaluate the effectiveness of the treatment by monitoring temperature and vital signs.
- Evaluate lab results for decreasing WBC counts to ensure the drug regamein is working.

### Interactions:

- **Kaolin- or aluminum-based antacids:** Decreased absorption of the lincosamides
- **Neuromuscular blocking drugs:** Increased action of neuro muscular blocking drug, possibly leading to severe and profound respiratory depression

### Nursing Alert

- Food impairs the absorption of lincomycin. The patient should take nothing by mouth (except water) for 1 to 2 hours before and after taking lincomycin. Clindamycin may be taken with food or a full glass of water.

Generic	Trade	Use	Dose
Clindamycin	Cleocin	Treatment of infections due to susceptible microorganism	Serious infection: 150–450 mg orally q 6 hr; severe infection: 600–2700 mg/day in 2–4 equal doses; life-threatening infection: up to 4.8 g/day IV, IM
Lincomycin	Lincocin	Treatment of infections due to susceptible microorganism	500 mg orally q 6–8 hr; 600 mg IM q 12–24 hr; up to 8 g/day IV in life-threatening situations

# Anti Infectives

## Drugs that interfere with protein synthesis

### How do they work? "Action"

- Daptomycin is a member of a new category of antibacterial agents called cyclic lipopeptides.
- Linezolid (Zyvox) is the first drug in a new drug class, the oxazolidinones
- Spectinomycin (Trobicin) is chemically related to but different from the aminoglycosides.
- Quinupristin/dalfopristin has bactericidal action against both methicillin-susceptible and methicillin-resistant staphylococci.

### Indications

- Daptomycin is used to treat complicated skin and skin structure bacterial infections as well as Staphylococcus aureus infections of the blood.
- Linezolid is used in the treatment of vancomycin resistant Enterococcus faecium (VREF), health care- and community-acquired pneumonias, and skin and skin structure infections.
- Spectinomycin is used for treating gonorrhea in patients who are allergic to penicillins, cephalosporins, or probenecid
- Quinupristin/dalfopristin is a bacteriostatic agent also used in the treatment of VREF.

### Contraindications

- Linezolid: Known hypersensitivity, PKU, pregnancy.
- Daptomycin, spectinomycin, and quinupristin/dalfopristin: known hypersensitivity to the drug, and it should not be used during pregnancy (pregnancy category B) or lactation.

### Nursing Alert

Quinupristin/dalfopristin is irritating to the vein. After peripheral infusion, the vein should be flushed with 5% dextrose in water (D5W), because the drug is incompatible with saline or heparin flush solutions. (Ford 88)

### Nursing management

- Before administering any antibiotic be sure to evaluate the results of the culture and sensitivity test.
- Complete the entire course of treatment. Do not stop the drug, except on the advice of a primary health care provider, before the course of treatment is completed, even if symptoms improve or disappear. Failure to complete the prescribed course of treatment may result in a return of the infection.

### Interactions:

- **Antiplatelet drugs** (aspirin or the nonsteroidal anti-inflammatory drugs [NSAIDs])-increased risk of bleeding and thrombocytopenia
- **Monoamine oxidase inhibitor (MAOI)** antidepressants-decreased effectiveness
- **Large amounts of food containing tyramine** (e.g., aged cheese, caffeinated beverages, yogurt, chocolate, red wine, beer, pepperoni) -risk of severe hypertension

### Adverse Reactions

- Nausea
- Vomiting
- Diarrhea or constipation
- Headache and dizziness
- Insomnia
- Rash
- Chills
- Fatigue
- Depression
- Nervousness
- Photosensitivity
- Pseudomembranous colitis and thrombocytopenia are the most serious adverse reactions caused by linezolid.

Generic	Trade	Use	Dose
Daptomycin	Cubicin C	Complicated skin and skin structure infections, Staphylococcus aureus blood infections	4 mg/kg IV daily for 7-14 days
Linezolid	Zyvox	Infections with VREF; pneumonia from Staphylococcus aureus and penicillin-susceptible Streptococcus pneumoniae; skin and skin structure infections	600 mg orally or IV q 12 hr
Quinupristin-dalfopristin S	Synercid	VREF	7.5 mg/kg IV q 8 hr

# Bipolar Meds - Lithium

## Drug name:

**Lithium**

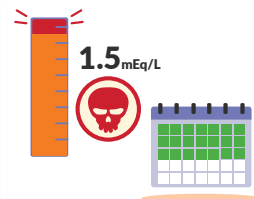


**L**

**LEVELS OVER 1.5 MEQ/L = TOXIC!**

### Common Test Question:

Is it lithium at Therapeutic level?  
Yes - continue at CURRENT dose



## Indication:

### Treatment:

- Bipolar
- Schizoaffective disorder

Given for long term treatment

**I**

**INCREASE FLUID & SODIUM (Na+)**

### KEY POINT Contraindicated

- Dehydration!
- Low sodium "Hyponatremia" below 135 mEq/L

**Do NOT limit sodium or water intake**

**HIGH RISK Toxicity**

**Stomach Flu (diarrhea & vomiting)**



Lithium Battery "B" Bipolar  
Since Lithium lasts a Long time

MEMORY TRICK

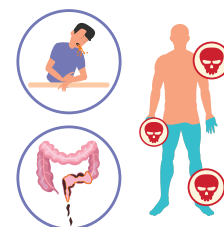
**- Lithium +**

**T**

**TOXIC SIGNS**

### REPORT to HCP!

- Report excessive urination and extreme thirst!!
- Vomiting & diarrhea
- Neuro Muscular excitability (tremors / myoclonic jerks)



### KEY POINT

**Toxicity Over 1.5**

**Key Kidney signs:**

- Creatinine **OVER 1.3 = BAD kidney!**
- Urine: **30 ml / hr or LESS = kidneys DISTRESS!**
- **S/S** = Tinnitus (ringing of the ears)

Urine Output < 30ml/hr



Creatinine > 1.3



**H**

**HOLD NSAIDS (Ibuprofen, Naproxen)**

### KEY POINT

- **NSAIDS (ibuprofen)** decrease renal blood flow increasing r/t toxicity
- **AVOID!! NEED FURTHER TEACHING!**



## Notes

# Anti-Coagulants

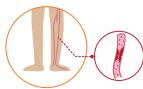
## LMW Heparin

### Heparin SQ

- -parin
- Enoxaparin (Lovenox)
- Dalteparin

Less heavy and less chances of major bleeding

### Indication:



### Key term

**Prevention** of DVT  
after surgery

### Administration:

1

25 G Needle ½ inch



2

Inject at  
90 degree angle



3

### LOCATION

#### NCLEX KEY WORD

2 inches from Umbilicus



NOT thigh



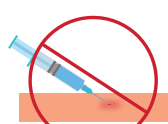
NOT IV route



4

### NO NO'S

Never aspirate SQ



NEVER RUB site!



Normal to have mild "pain, bruising, irritation, redness at site"

### Common ATI question:

Enoxaparin

"Which statements needs  
**FURTHER TEACHING**"

- I will inject the med into my thigh
- I will need Frequent Blood tests

### HESI question:

"Client on **ENOXAPARIN**"  
Report to HCP:

- 1. H & H decreased
- 2. BP drops by 20 points

### NCLEX Key Term:

**Notify HCP** and clarify order for enoxaparin if H/H Slightly low!  
Open fractures & H&H LOW - Enoxaparin is a **NO GO!**



### KEY Numbers

Platelets should be  
**150k - 400k**

- **HOLD MED** Plt less than 50,000

Another risk is HIT - Heparin Induced Thrombocytopenia!  
If Platelets decrease by **HALF** in 24 hours after starting heparin of any type, this typically indicates HIT and it's **VERY DEADLY!**

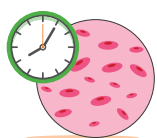
H

HIT is when



H

**HALF** platelets  
GONE in **24 hours!**



H

Heparin



### PRIORITY ACTION

**1. Alert the HCP!**



### Enoxaparin Labs:

**30%**

**STUDENTS WRONG**  
Most commonly  
chosen distractor!

#### Enoxaparin Labs

**Low Platelets**

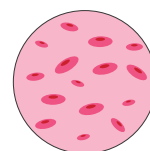
**NOT** aPTT or INR



**P** - Parin  
(Enoxaparin)



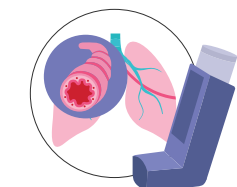
**P** - Platelet  
**FOCUSED**



### Notes

# Lower Respiratory Drugs

## NCLEX NOTES

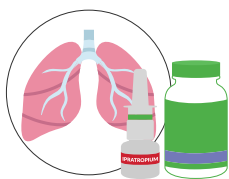


### BRONCHODILATORS

**B** Beta 2 Agonist  
Albuterol

**A** Anticholinergics  
Ipratropium

**M** Methylxanthines  
Theophylline



### ANTI-INFLAMMATORY Agents

**S** Steroids  
Beclomethasone

**L** Leukotriene Inhibitor  
Montelukast

**M** Mast Cell Stabilizers  
Cromolyn

## Most Commonly Missed Question

Patient with Severe asthma:

- Tachycardia (>120 BPM)
- Tachypnea (> 30 BPM)
- O2 sat < 90% on RA
- Peak exp. Flow < 40% predicted or best < 150L/min)

Which medication would you give?

Select All that apply

- ☐ 1. Inhaled salmeterol
- ✓ ☒ 2. Albuterol inhaler
- ✓ ☒ 3. Nebulizer Ipratropium
- ☐ 4. IV methamphetamines
- ✓ ☒ 5. IV Methylprednisolone



## Common Exam Questions:

A client is receiving discharge instructions for a inhaled corticosteroid metered dose inhaler. Which teaching should the nurse include?

- ☐ 1. Discard the use fluticasone if albuterol provides relief.
- ✓ ☒ 2. Do not swallow the water as you wash your mouth after each use.
- ☐ 3. If taking albuterol, be sure to use after the steroid.
- ☐ 4. Steroid inhalers should be used before beta 2 agonists.

Which statement by the patient requires further teaching?

- ☐ 1. I will use cromolyn to prevent activity induced asthma
- ☐ 2. I will use montelukast to prevent asthma attacks.
- ☐ 3. I will use spacers to prevent oral thrush while using beclomethasone.
- ✓ ☒ 4. I will take cromolyn 45 minutes before physical activity



## 3 Common NCLEX & Exit Questions

Which of the follow prescriptions should the nurse question?

- ✓ ☒ 1. Naproxen for an asthmatic patient
- ✓ ☒ 2. Ipratropium for a patient with glaucoma
- ☐ 3. Losartan for a patient with diabetes.
- ✓ ☒ 4. Theophylline for a patient taking cimetidine.
- ✓ ☒ 5. Atenolol for a patient with asthma

What patient teaching should be included with a new prescription of albuterol, ibuprofen, tiotropium and beclomethasone?

Select All That Apply

- ☐ 1. Tinnitus is an expected side effect.
- ✓ ☒ 2. Tachycardia is expected after albuterol.
- ✓ ☒ 3. Report dark stool to the provider.
- ✓ ☒ 4. Drink fluids to prevent dry mouth and throat.
- ☐ 5. Ipratropium is used first during an attack.

Which medication prescribed for asthma causes tachycardia & dysrhythmias?

- ☐ 1. Phenobarbital
- ✓ ☒ 2. Aminophylline
- ☐ 3. Salmeterol
- ☐ 4. Albuterol



# Anti Infectives

## - Macrolides

### How do they work? "Action"

The macrolides are bacteriostatic or bactericidal in susceptible bacteria. The drugs act by causing changes in protein function and synthesis.

### Indications

- A wide range of gram-negative and gram-positive infections
- Acne vulgaris and skin infections
- Upper respiratory infections caused by *Haemophilus influenzae* (with sulfonamides) (Ford 86)

### Adverse Reactions

- Nausea
- Vomiting
- Diarrhea
- Abdominal pain or cramping
- Visual disturbances (associated with telithromycin) may also occur.

### Education

- Take the drug at the prescribed time intervals. These intervals are important because a certain amount of the drug must be in the body at all times for the infection to be controlled.
- Do not increase or omit the dose unless advised to do so by the primary health care provider.
- Complete the entire course of treatment. Never stop the drug, except on the advice of a primary health care provider, before the course of treatment is completed even if symptoms improve or disappear. Failure to complete the prescribed course of treatment may result in a return of the infection.
- Take each dose with a full (8-ounce) glass of water. Follow the directions given by the clinical pharmacist regarding taking the drug on an empty stomach or with food (see Patient Teaching for Improved Patient Outcomes: Avoiding Drug-Food Interactions).

### Nursing management

- Before administering any antibiotic be sure to evaluate the results of the culture and sensitivity test.
- Take the drug at the prescribed time intervals. These time intervals are important because a certain amount of the drug must be in the body at all times for the infection to be controlled..
- Do not increase or omit the dose unless advised to do so by the primary health care provider.
- Complete the entire course of treatment. Do not stop the drug, except on the advice of a primary health care provider, before the course of treatment is completed, even if symptoms improve or disappear. Failure to complete the prescribed course of treatment may result in a return of the infection.

### Interactions:

- **Antacids (kaolin, aluminum salts, or magaldrate):** Decreased absorption and effectiveness of the macrolides
- **Digoxin:** Increased serum levels
- **Anticoagulants:** Increased risk of bleeding
- **Clindamycin, lincomycin, or chloramphenicol:** Decreased therapeutic activity of the macrolides
- **Theophylline:** Increased serum theophylline

### Contraindications & Caution

These drugs are contraindicated in patients with hypersensitivity to the macrolides and in patients with pre-existing liver disease. Telithromycin (Ketek) should not be ordered if a patient is taking cisapride (Propulsid) or pimozide (Orap). (Ford 86)

Generic	Trade	Use	Dose
Azithromycin	Zithromax, Zmax	Treatment of infections due to susceptible microorganism	500 mg orally first day then 250 mg/day orally
Clarithromycin	Biaxin	<i>Helicobacter pylori</i> therapy, Treatment of infections due to susceptible microorganism	250-500 mg orally q 12 hr
Erythromycin	E-Glades, Eryc, Ery-Ped, E.E.S.	Treatment of infections due to susceptible microorganism	250 mg orally q 6 hr or 333 mg q 8 hr up to 4 g/day

# Macrolides

## Azithromycin

### Drug name:

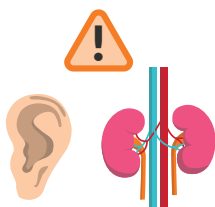
Macrolides end in "-**thromycin**"

- **Azy**thromycin
- **Ery**thromycin

YES it's TRUE, they sound a lot like our other **mysins**, but these are **THRO**mycin.

**THRO**mycin  
— "mysin" —

They are not too hard on RENALS or EARS but they are **DANGEROUS** in their own way.



### Key Words:

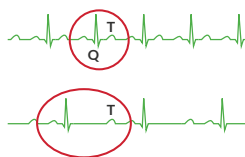
#### KEY POINT:

- Prolonged QT
- MONITOR ECG and report changes to Dr. or HCP!!!!

#### MEMORY TRICKS

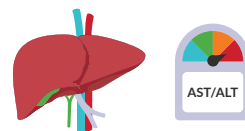
**Th**romycin

**Th**rows ECG waves  
"Prolonged **QT** intervals"



### Key NCLEX Tips:

They are also: Hepatotoxic or **LIVER TOXIC**.  
So monitor Liver Labs (ALT/AST):  
**Report** increase to HCP

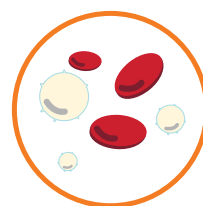


Be careful with acetaminophen for Fever during infection. Tylenol is liver **TOXIC**



### Side Effects:

Common SIDE EFFECTS - Now don't be tricked!  
Common test questions ask If you stop giving during for Nausea, vomiting, fever & decreasing WBC's



Nausea and vomiting is common since it's taken on empty stomach



Fever is expected during an infection, so keep on giving



Decreasing WBC means infection is improving so DON'T BE TRICKED!

### Notes

# Antidepressants

## - MAOI

### Drug names:

**PHENELZINE** Brand: Nardil  
**SELEGILINE**  
**ISOCARBOXAZID**  
**TRANLYCYPROMINE**



### Indication:

Very powerful antidepressants:  
 Depression, Panic disorder & Social phobia. Used for depression that is resistant to other meds



### MOA:

Increase availability of norepinephrine, serotonin, and dopamine in brain



### KEY Words

- Pt States: **"This med is not working after 2 weeks"**
- ASSESS 1<sup>st</sup>
- Further expressions of:
  - Hopelessness
  - Despair
  - Suicidal thoughts
  - Thoughts of self-harm



**M**

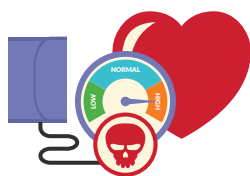
**A**

**O**

**O**

**I**

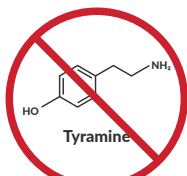
**M**assive  
HTN crisis Risk



#### NCLEX Key terms:

Headache  
Increased Agitation

**A**VOID  
TYRAMINE



- Wine & Cheese (NO wine tasting)
- Beer & Sausage, Salami (NO beer fest)
- Chocolate

**O**TC drugs  
= HTN CRISIS!!!



**C** - Calcium  
**A** - Anti acids  
**A** - Acetaminophen  
**N** - NSAIDS (Naproxen, Ibuprofen)

**O**ther  
Antidepressants



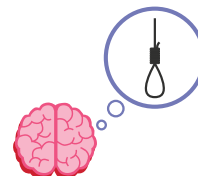
#### Serotonin Syndrome

2 week wash-out

#### KEY DRUGS:

NO! Escitalopram (SSRI)  
 NO! Imipramine (TCA)

**I**ncreased  
Suicide risk



#### NCLEX Key terms:

When starting med.  
Increasing Dose

### Notes

# Immunosuppressants

## Methotrexate

### Drug name:

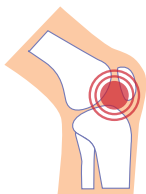
**Methotrexate**



### Indication:

Kaplan

Mainly for **Rheumatoid Arthritis** (Autoimmune disease) body is attacking it's own joints



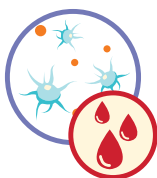
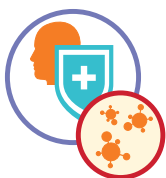
### MOA:

Stops folic acid metabolism, which stops cell reproduction



### Adverse Effects:

- Low immunity = Infections
- Low Platelets = serious bleeding
- Fetal death in pregnancy



### HESI Question

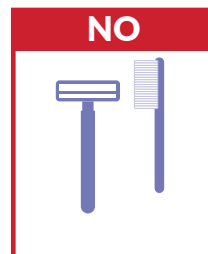
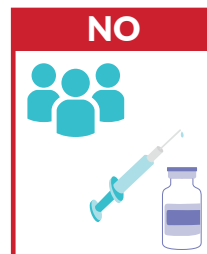
#### Methotrexate:

Suppresses B and T lymphocytes



### MEMORY TRICK

Meth **NOOO** trexate



- **NO** pregnant clients
- **NO** crowds or LIVE vaccines
- **NO** razors or brushing teeth hard

### KEY POINT

#### Infection & Bleeding

- **Infection Risk**
  - Report Fever (over **100.3° F**, 38°C)
  - Avoid crowds & sick people
  - Avoid fresh fruit & flowers
- **Thrombocytopenia** (platelets under **100,000**)
  - Report bleeding:
    - Petechiae (bleeding under **skin**)
    - Purpura (purple spots on **skin**)
    - Melena (black tarry **stool**)
    - Hematemesis (**vomiting** blood)
    - Bleeding Gums



< 100,000

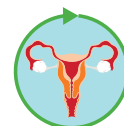


Thrombocytopenia

### KEY POINT

**NO Pregnancy** - NOT BABY SAFE  
**MUST** use Birth Control

- **"No pregnancy** until **one menstrual cycle** after treatment is resolved"
- **"No pregnancy** until **3 months** after treatment is finished"
- **"Men ... no trying for a baby** until **3 months** after treatment with methotrexate is complete"



### Notes

# Immunosuppressants

## Methotrexate

### Drug name:

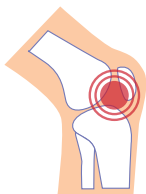
**Methotrexate**



### Indication:

Kaplan

Mainly for **Rheumatoid Arthritis** (Autoimmune disease) body is attacking it's own joints



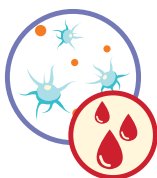
### MOA:

Stops folic acid metabolism, which stops cell reproduction



### Adverse Effects:

- Low immunity = Infections
- Low Platelets = serious bleeding
- Fetal death in pregnancy



### HESI Question

#### Methotrexate:

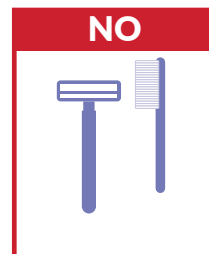
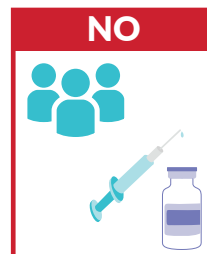
Suppresses B and T lymphocytes



B lymphocyte T lymphocyte

### MEMORY TRICK

Meth **NOOO** trexate



- **NO** pregnant clients
- **NO** crowds or LIVE vaccines
- **NO** razors or brushing teeth hard

### KEY POINT

#### Infection & Bleeding

- **Infection Risk**
  - Report Fever (over **100.3° F**, 38°C)
  - Avoid crowds & sick people
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    - Bleeding Gums



< 100,000

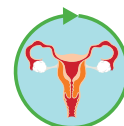


Thrombocytopenia

### KEY POINT

**NO Pregnancy** - NOT BABY SAFE  
**MUST** use Birth Control

- **"No pregnancy** until **one menstrual cycle** after treatment is resolved"
- **"No pregnancy** until **3 months** after treatment is finished"
- **"Men ... no trying for a baby** until **3 months** after treatment with methotrexate is complete"



### Notes

# Metronidazole

## Indication:

**Metronidazole**  
(brand: Flagyl)

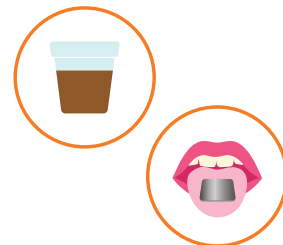
- #1 Drug to treat C-diff infection
- STI (Trichomoniasis) **HESI TIP**



## Normal Side effect

**NO need to report!**

- Dark urine "Discoloration" (brown & rusty)
- Metallic taste (Metro-Metallic Taste)



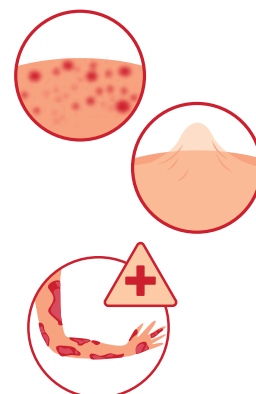
## KEY POINT:

- Avoid ETOH** (alcohol) During & 3 days after treatment
- Patients will have violent **vomiting & cramping** if alcohol is consumed during and after treatment



## DEADLY Side effect

- Report** any new rash or skin peeling!
- Stevens-Johnson Syndrome**, which is **NECROSIS** of skin and mucous membranes! Always **TEACH** patients to **REPORT** immediately



Stevens-Johnson Syndrome

## Memory Trick:

**M**

**E**

**T**

**R**

**O**

## METALLIC

Taste & Dark Urine



**NORMAL**

## ETOH

Avoid



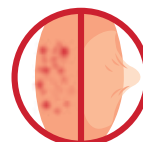
## TREATS

C Diff & STI  
(Trichomoniasis)



## RASH

or Skin Peeling



**REPORT**

## OH NOT

"Dazole"ing



## Notes

# Migraine

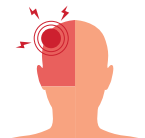
## Drug name:

**Sumatriptan**



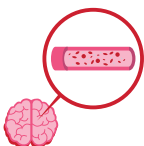
## Indication:

Given to treat migraines & cluster headaches



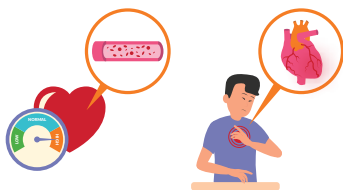
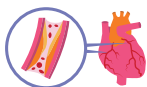
## MOA:

Vasoconstriction of brain vessels



## Contraindication:

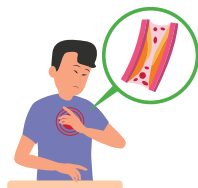
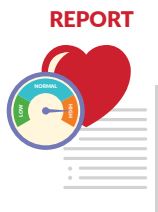
- CAD - coronary artery disease
- Uncontrolled Hypertension  
Risk for HTN crisis, angina & MI



## KEY POINT

- Screen for **history of uncontrolled HTN** & **REPORT** it!

**ATI** Teach: **Report** angina (coronary vasospasms) with **Sumatriptan**



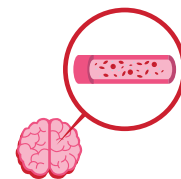
## Drug name:

**Ergotamine SL**



## MOA:

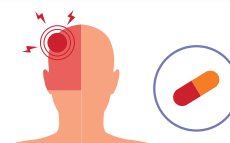
Vasoconstriction of brain vessels



## ATI Question

**Indication** = Migraine Headaches

**Teach** = Take one tablet immediately at onset of headaches



## HESI Question

**Ergotamine**

Priority finding: Pale extremities



Notes

# Mineralocorticoids

## How do they work? "Action"

Natural mineralocorticoids consist of aldosterone and desoxycorticosterone and play an important role in conserving sodium and increasing potassium excretion. Because of these activities. Mineralocorticoids are important in controlling salt and water balance. Aldosterone is the more potent of these two hormones. Deficiencies of mineralocorticoids result in a loss of sodium and water and a retention of potassium. (Ford 474)

## Indications

Mineralocorticoids are important in controlling salt and water balance. Aldosterone is the more potent of these two hormones. Deficiencies of mineralocorticoids result in a loss of sodium and water and a retention of potassium. (Ford 474)

## Adverse Reactions

Adverse reactions may occur if the dosage is too high or prolonged or if withdrawal is too rapid. Administration of fludrocortisone may cause:

- Edema
- Hypertension
- HF, enlargement of the heart
- Increased sweating, allergic skin rash
- Hypokalemia, muscle weakness, headache, hypersensitivity reactions (Ford 474)

## Contraindications

Fludrocortisone is contraindicated in patients with hypersensitivity to fludrocortisone and those with systemic fungal infections.

## Nursing management

- Take the drug as directed. Do not increase or decrease the dosage except as instructed to do so by the primary health care provider.
- Do not discontinue use of the drug abruptly.
- Inform the primary health care provider if the following adverse reactions occur: edema, muscle weakness, weight gain, anorexia, swelling of the extremities, dizziness, severe headache, or shortness of breath. (Ford 477)

## Interactions:

- Fludrocortisone decreases the effects of hydantoins and rifampin. There is a decrease in serum levels of salicylates when those agents are administered with fludrocortisone. (Ford 474)

Generic	Trade	Use	Dose
Fludrocortisone	None	Partial replacement therapy for Addison's disease, salt-losing adrenogenital syndrome	0.1 mg 3 times a week to 0.2 mg/day orally

# Mucosal Protectant

## Drug name:

**Sucralfate**  
(brand: Carafate)



## Indication:

Given to treat and prevent both stomach and duodenal ulcers (small intestines)



## MOA:

Forms thick protective layer over ulcers to provide a physical barrier against stomach acids & enzymes



## KEY Point

### AVOID

- FOOD & MEDS at least **1-2 hours** before or after taking med
- DO NOT TAKE WITH ANY OTHER MEDS!**



## MEMORY TRICK

Sucral**fATE**

- 2 hours Before **YOU ATE!!!**
- Taken **LATE**

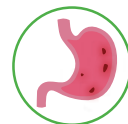


## Drug name:

**Misoprostol**

## Indication:

Protect against gastric ulcers



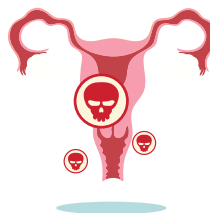
## MOA:

Synthetic prostaglandin that increases protective mucous inside the stomach



## Major Adverse Effect:

**Misoprostol**  
**Miscarriage RISK!!!**  
Due to cervical ripening



## Patient Education:

## HESI Key Term

### Cervical ripening

- Reliable birth control
- Do not take with antacids (Anti-Acids = Anti Mixing meds)



## Notes

# Skeletal Muscle Drugs

## - Skeletal Muscle Relaxants

### How do they work? "Action"

Many of these drugs do not directly relax skeletal muscles, but their ability to relieve acute painful musculoskeletal conditions may be due to their sedative action. Cyclobenzaprine appears to have an effect on muscle tone, thereby reducing muscle spasm.

### Indications

- Skeletal muscle relaxants are used in various acute painful musculoskeletal conditions, such as muscle strains and back pain.

### Adverse Reactions

- Drowsiness
- Sedation
- sleepiness, lethargy, constipation
- Diarrhea
- bradycardia or tachycardia, and rash.

### Contraindications

- Baclofen is contraindicated in skeletal muscle spasms caused by rheumatic disorders.
- Carisoprodol is contraindicated in patients with a known hypersensitivity to meprobamate.
- Cyclobenzaprine is contraindicated in patients with a recent myocardial infarction, cardiac conduction disorders, and hyperthyroidism.
- Cyclobenzaprine is contraindicated within 14 days of the administration of a monoamine oxidase inhibitor (MAOI).
- Oral dantrolene is contraindicated during lactation and in patients with active hepatic disease and muscle spasm caused by rheumatic disorders.

### Interactions

- **Central nervous system (CNS) depressants, such as alcohol, antihistamines, opiates, and sedatives:** Increased CNS depressant effect

#### Cyclobenzaprine

- **MAOIs:** Risk for high fever and convulsions

#### Orphenadrine

- **Haloperidol:** Increased psychosis

#### Tizanidine:

- **Antihypertensives:** Increased risk of hypotension

### Nursing management

- This drug may cause drowsiness. Do not drive or perform other hazardous tasks if drowsiness occurs.
- This drug is for short-term use. Do not use the drug for longer than 2 to 3 weeks.
- Avoid alcohol or other CNS depressants while taking this drug.

# Muscle Relaxers

## 3 BIG TEST TIPS

1. **Dizziness** upon changing positions is expected
2. **NO** alcohol
3. **DO NOT** Abruptly Stop

## Top 3 Missed Questions

Which teaching should the nurse provide for a patient who is prescribed **calcium carbonate** for a new diagnosis of osteoporosis? **Select all that apply.**

- ✓ 1. Always take calcium carbonate in divided doses less than 500 mg per dose.
- 2. Take calcium carbonate 2 hours before or after meals.
- 3. Stop taking calcium carbonate if constipation develops
- 4. Schedule weekly blood draws to monitor serum calcium levels.
- ✓ 5. Continue taking Vitamin D supplements while taking calcium carbonate.

What teaching should the nurse include for a patient newly prescribed **allopurinol** for the treatment of gout? **Select all that apply.**

- ✓ 1. Report the development of any new rash to your provider immediately.
- 2. Take your allopurinol at the first sign of an acute attack.
- ✓ 3. You may continue to treat pain associated with acute attacks with ibuprofen.
- 4. Report any symptoms of nausea to your provider immediately.
- ✓ 5. Allopurinol helps prevent the build up of uric acid which leads to acute attacks.

When providing education to a patient who is newly prescribed **cyclobenzaprine**, which instructions should be included? **Select all that apply.**

- 1. Notify the provider of a temperature greater than 99.5 F
- 2. Report any drowsiness to the health care provider.
- ✓ 3. Do not stop taking this medication abruptly.
- 4. Limit wine consumption to 3-4 glasses per day while taking this medication.
- 5. Avoid taking ibuprofen while taking this medication.

### Drug name:

**Dantrolene**



### MOA:

Acts directly on the muscle to **prevent the release of calcium**

### Indication:

- Spinal Cord injury
- Cerebral Palsy
- Multiple Sclerosis

### SIDE EFFECT



### KAPLAN

**Dantrolene**  
Muscle relaxant

### HESI

**Dantrolene**  
Contraindicated in client with MS and **Cirrhosis**

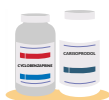
### MEMORY TRICK

Calcium Contracts muscles  
Less calcium = Less Contraction

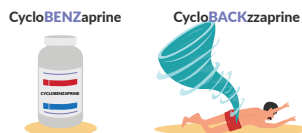


### Drug name:

**CycloBENZaprine & Carisoprodol**

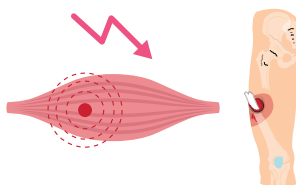


### MEMORY TRICK



### Indication:

Reduces muscle spasms after surgery on open fractures



### Side Effects

### HESI Question

**Carisoprodol**

- Risk of dependence
- Drowsiness & sedation

### Pt teaching

### ATI Question

Taper off medication -  
**DO NOT** stop abruptly!

### Drug name:

**Baclofen**



### Indication:

Decrease in flexor and extensor spasticity with spinal cord injury, MS & cerebral palsy



### MOA:

Enhances GABA to make everything low & slow



### Side Effects:

- Constipation
- Low BP & orthostatic hypotension



### KEY POINTS

- Dizziness upon changing positions
- **NOT** a contraindication to giving this med
- **NEVER** Abruptly Stop (any muscle relaxant)

### Memory Trick

- **Baclofen**
- **Back** off slowly (do not abruptly stop)

### HESI Question

Side effects of **Baclofen**:

- Ortho-hypotension, Dizziness, Nausea

**Potential Deadly Effects:**

- Rhabdomyolysis
- Multiple organ failure



# Need to know medications for NCLEX I

## ANALGESICS

- Opioids
- ↓ pain threshold by altering pain perception

Common Brand Names	Generic Names
<b>Demerol</b>	<b>Meperidine HCL</b>
<b>Dilaudid</b>	<b>Hydromorphone</b>
<b>Duragesic, Sublimaze</b>	<b>Fentanyl</b>
<b>Morphine Sulfate</b>	<b>Morphine Sulfate</b>
<b>Vicodin, Norco</b>	<b>Hydrocodone</b>

## BENZODIAZEPINES (Pam & Lam)

- Enhance/facilitate GABA, an inhibitory neurotransmitter

Common Brand Name	Generic Name
<b>Xanax</b>	<b>Alprazolam</b>
<b>Valium</b>	<b>Diazepam</b>
<b>Ativan</b>	<b>Lorazepam</b>
<b>Versed</b>	<b>Midazolam</b>

## ANXIOLYTICS

- Azaspirodecanedione derivatives
- ↓ anxiety. Action unknown, thought to act by ↓ the amount/action of serotonin in certain parts of the brain.

Common Brand Names	Generic Names
<b>Buspar</b>	<b>Buspirone Hydrochloride</b>

## ANTICONVULSANTS

↓ interval between seizures

Common Brand Name	Generic Name
<b>Dilantin</b>	<b>Neurontin</b>
<b>Tegretol</b>	<b>Depakote</b>
<b>Phenytoin Carbamazepine</b>	<b>Gabapentin Valproic Acid</b>

\*Neurontin is sometimes prescribed for chronic pain neuropathy

\*Monitor blood levels: Dilantin, Tegretol, and Depakote

## ANTIDEPRESSANTS

- SSRIs
- Act by inhibiting serotonin reuptake in CNS

Common Brand Names	Generic Names
<b>Celexa</b>	<b>Citalopram</b>
<b>Effexor</b>	<b>Venlafaxine</b>
<b>Lexapro</b>	<b>Escitalopram Oxalate</b>
<b>Paxil</b>	<b>Paroxetine</b>
<b>Prozac</b>	<b>Fluoxetine</b>
<b>Zoloft</b>	<b>Sertraline</b>

## TRICYCLICS

- Act by blocking reuptake of norepinephrine and serotonin at nerve endings

Common Brand Names	Generic Names
<b>Elavil</b>	<b>Amitriptyline</b>

# Need to know medications for NCLEX II

## SEDATIVES/HYPNOTICS

Common Brand Names	Generic Name
<b>Ambien</b>	<b>Zolpidem Tartrate</b>
<b>Lunesta</b>	<b>Eszopiclone</b>

## ANTICOAGULANTS

- Interferes with blood clotting processes. Used to prevent thrombus and embolus

Common Brand Names	Generic Name
<b>Coumadin</b>	<b>Warfarin</b>
<b>Lovenox</b>	<b>Enoxaparin</b>
<b>Heparin</b>	<b>Heparin Sodium—from beef/pork</b>

## ANTIPLATELETS

- Interferes with the 1ST step in the clotting process: platelet aggregation

Common Brand Names	Generic Name
<b>ASA - aspirin</b>	<b>Acetylsalicylic Acid</b>
<b>Plavix</b>	<b>Clopidogrel</b>

- \*Pepto-Bismol contains aspirin

## DIURETICS

- ☒ fluid volume in the body \*\*NI= monitor daily weight under standard conditions, assess BP, I&O, presence of edema

## LOOP DIURETICS

- Inhibit reabsorption of Na<sup>+</sup>, Cl<sup>-</sup>, K<sup>+</sup> and H<sub>2</sub>O (in loop of Henle), but also in proximal and distal renal tubules

Common Brand Names	Generic Name
<b>Bumex</b>	<b>Bumetanide</b>
<b>Demadex</b>	<b>Torsemide</b>
<b>Lasix</b>	<b>Furosemide</b>

## Thiazide Diuretics

- Generic Name** • ☒ excretion of Na<sup>+</sup>, Cl<sup>-</sup>, K<sup>+</sup>, H<sub>2</sub>O in distal tube and ascending loop of Henle

Common Brand Names	Generic Name
<b>Diuril</b>	<b>Chlorothiazide Sodium</b>
<b>Hydrodiuril, HCTZ</b>	<b>Hydrochlorothiazide</b>
<b>Zaroxolyn</b>	<b>Metolazone</b>

## POTASSIUM SPARING

- Contains aldosterone at receptor sites in distal tubule; excrete Na<sup>+</sup>, Cl<sup>-</sup>, H<sub>2</sub>O, not K<sup>+</sup>

Common Brand Names	Generic Name
<b>Aldactone</b>	<b>Triamterene</b>
<b>Dyrenium</b>	<b>Spironolactone</b>

# Need to know medications for NCLEX III

## ANTIHYPERTENSIVES – (PRIL)

- ACE Inhibitors
- Block the conversion of angiotensin I to angiotensin II (potent vasoconstrictor)–Causing vasodilation and PVR (peripheral vascular resistance) without ↓ cardiac output/rate/contractility–Aldosterone is also blocked, causing a ↓ in Na<sup>+</sup> and H<sub>2</sub>O retention. Side effect: Napping, nonproductive cough, angioedema

Common Brand Name	Generic Name
<b>Altace</b>	<b>Ramipril</b>
<b>Capoten</b>	<b>Captopril</b>
<b>Prinivil, Zestril</b>	<b>Lisinopril</b>
<b>Vasotec</b>	<b>Enalapril</b>

\*check potassium level

## ALPHA 2 ANTAGONISTS

- centrally-acting anti-hypes causing ↓ amounts of norepinephrine to be released, ↓ sympathetic activity

Common Brand Names	Generic Names
<b>Catapres</b>	<b>Clonidine</b>

## BETA BLOCKERS–(LOL)

- Prevent sympathetic stimulation of the heart, thus ↓ HR and contractility.
- ↓ myocardial irritability, depress automaticity of SA node, ↓ speed of AV & intraventricular conduction
- suppress release of renin from the kidneys.

Common Brand Name	Generic Name
<b>Inderal</b>	<b>Propranolol</b>
<b>Lopressor</b>	<b>Metoprolol Tartrate</b>
<b>Toprol-XL</b>	<b>Metoprolol Succinate</b>
<b>Tenormin</b>	<b>Atenolol</b>

- \*May cause bronchoconstriction.

## ALPHA 1 ADRENERGIC BLOCKERS–(ZOSYN)

- Dilate blood vessels and ↓ (PVR)

Common Brand Names	Generic Name
<b>Hytrin</b>	<b>Terazosin</b>
<b>Minipress</b>	<b>Prazosin</b>

## ALPHA & BETA ADRENERGIC BLOCKERS–(LOL)

- Alpha blockers–block alpha 1 receptors ↓ vasodilation. Beta blockers–block beta 1 & beta 2 receptors:
- ↓ reduce HR, myocardial irritability, force of contraction
- ↓ depress automaticity of SA node, ↓ speed of AV & intraventricular conduction ↓ suppress release of renin from the kidneys

Common Brand Names	Generic Name
<b>Coreg</b>	<b>Carvedilol</b>
<b>Trandate, Normodyne</b>	<b>Labetalol</b>

## CALCIUM CHANNEL BLOCKERS

- Block Na<sup>+</sup> influx into the beta-receptors
- ↓ force of myocardial contraction/conductivity
- ↓ HR, ↓ PVR.
- Produce relaxation of coronary & vascular smooth muscle; dilates coronary arteries; ↓ myocardial O<sub>2</sub> delivery, ↓ O<sub>2</sub> demand.
- Side effect: edema, dysrhythmias

Common Brand Name	Generic Name
<b>Cardizem</b>	<b>Diltiazem</b>
<b>Norvasc</b>	<b>Amlodipine</b>
<b>Procardia</b>	<b>Nifedipine</b>
<b>Verelan, Isoptin, Calan</b>	<b>Verapamil</b>

# Need to know medications for NCLEX IV

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## ARBs-(SARTAN)

- Block binding of angiotensin II at the receptor site, preventing vasoconstriction & aldosterone secretion usually caused by angiotensin II

Brand Names	Generic Name
Atacand	Candesartan
Cozaar	Losartan
Diovan	Valsartan

## CARDIAC GLYCOSIDES

- Positive inotropes (improve contractility and cardiac output)
- Negative dromotropic slow AV conduction rate.
- Negative chronotropes ↓ HR & improve cardiac output.
- Act as antiarrhythmic via tropic effect.
- \*\*NI=Monitor K+ level, S/S toxicity

Brand Name	Generic Name
Lanoxin	Digoxin

- \*Monitor Dig & K+ level, S/S toxicity

## BIGUANIDES

- ↓ hepatic glucose production & intestinal absorption of glucose
- improves insulin sensitivity (tissue response to insulin)

Brand Names	Generic Names
Glucophage	Metformin

- \*Initial drug therapy for newly DX T2DM.
- \*Most common side effect: GI.
- \*Rare side effect: Lactic acidosis

Brand Names	Generic Names
Januvia	Sitagliptin

## GLIPTINS (DPP-4 Enzyme Inhibitors)

- levels of incretins—naturally occurring substances control blood sugar by insulin release, especially after a meal.

## NITRATES

- Peripheral and coronary vasodilators.
- Treat/prevent angina, ↓ BP ↓, preload/afterload, ↓ myocardial O2 demand.
- \*\*NI=rotate transdermal patches/remove after 12-14 hours =(“patch free” interval of 10-12 hours daily)

Common Brand Names	Generic Name
Nitro BID Tridil Transderm Nitro Nitrostat	Nitroglycerin
Imdur	Isosorbide Mononitrate
Isorbid Isordil Sorbitrate	Isosorbide Dinitrate

- \*Check Potassium Level

## ANTI-DIABETICS

- Sulfonylureas
- Promotes insulin secretion by the pancreas; tissue response to insulin

Brand Names	Generic Name
Amarly	Glimepiride
Diabeta Glynase Micronase	Glyburide
Glucotrol (XL)	Glipizide

## GLITAZONES-(GLITAZONE)

- Decrease insulin resistance

Common Brand Names	Generic Name
Actos	Pioglitazone
Avandia	Rosiglitazone

- \*Edema; HF secondary to renal retention of fluid

# Need to know medications for NCLEX V

## PROTON PUMP INHIBITORS (PPI)

- Block final step of gastric acid production
- Ulcer-reducing

Brand Names	Generic Name
Nexium	Esomeprazole
Prilosec	Omeprazole
Protonix	Pantoprazole

## ANTIEMETICS

- Act by ☒ preventing nausea & vomiting

Brand Names	Generic Name
Phenergan	Promethazine
Zofran	Ondansetron

## MISCELLANEOUS ANTILIPIDEMICS

Brand Name	Generic Name
<b>Zetia</b> Selective cholesterol absorption inhibitor	<b>Ezetimibe</b> Inhibits absorption of cholesterol by small intestine
<b>TriCor</b> Fibric Acid Derivative	<b>Fenofibrate</b> <input checked="" type="checkbox"/> triglyceride synthesis in liver
<b>Lopid</b> Fibric Acid Derivative	<b>Gemfibrozil</b> triglyceride synthesis in liver
<b>Questran</b> Bile acid sequestrant (food additive improving quality)	<b>Cholestyramine</b> Binds bile acids, impeding absorption (elimination in feces)

## H2-HISTAMINE RECEPTOR ANTAGONISTS

- Inhibit histamine at histamine H2-receptor sites, gastric acid secretion

Brand Names	Generic Name
<b>Pepcid</b>	<b>Famotidine</b>
<b>Zantac</b>	<b>Ranitidine</b>

## ANTILIPIDEMICS

- STATINS (HMG-COA REDUCTASE INHIBITORS)
- Inhibits HMG-CoA reductase, an early step in cholesterol production

Brand Names	Generic Name
<b>Crestor</b>	<b>Rosuvastatin</b>
<b>Lipitor</b>	<b>Atorvastatin</b>
<b>Zocor</b>	<b>Simvastatin</b>

- \*Rhabdomyolysis, Hepatotoxicity

## GI MEDS

- Non-absorbable medications used prophylactically to treat/prevent ulcers and GERD
- GI Protectant
- Mixes with gastric acid to form a protective coating of gastric mucosa

Brand Names	Generic Names
<b>Carafate</b>	<b>Sucralfate</b>

## GI STIMULANT

- Act b resting tone of esophageal sphincter Promotes gastric emptying/intestinal transit

Brand Names	Generic Names
<b>Reglan</b>	<b>Metoclopramide</b>

- \*Sometimes used with diabetic gastroparesis

# Need to know medications for NCLEX VI

## STOOL SOFTENERS

- surface tension of interfacing liquid contents of the bowel-promoting additional liquid into stools=softer mass.

Brand Names	Generic Name
<b>Colace</b>	<b>Docusate Sodium</b>
<b>Surfak</b>	<b>Docusate Calcium</b>

## ANTI-INFECTIVES

- Aminoglycosides

Brand Names	Generic Name
<b>Gentamicin</b>	<b>Gentamicin Sulfate</b>
<b>Streptomycin</b>	<b>Streptomycin Sulfate</b>
<b>Tobramycin</b>	<b>Tobramycin Sulfate</b>

## RESPIRATORY MEDICATIONS

- Bronchodilators
- Relax bronchial smooth muscle

Brand Names	Generic Names
<b>Proventil, Ventolin</b>	<b>Albuterol Sulfate</b>
<b>Brovana</b>	<b>Arformoterol Tartrate</b>
<b>Foradil</b>	<b>Formoterol Fumarate</b>
<b>Xopenex</b>	<b>Levalbuterol</b>
<b>Spiriva</b>	<b>Tiotropium</b>
<b>Advair</b> <b>Advair Diskus</b>	<b>Fluticasone/Salmeterol</b> • *combo drug (flut-potent anti-inflam effects/Salm-bronchodilator)

## CORTICOSTEROIDS

- inflammation, produce intentional immunosuppression, and treat adrenocortical insufficiency

Brand Names	Generic Names
<b>Celestone</b>	<b>Betamethasone</b>
<b>Decadron</b>	<b>Dexamethasone</b>
<b>Deltasone</b>	<b>Prednisone</b>
<b>Solu-Cortef</b>	<b>Hydrocortisone</b>
<b>Solu-Medrol</b>	<b>Methylprednisolone</b>

- \*Monitor WBC and Blood Glucose levels

## ANTIPROTOZOAL

Brand Names	Generic Names
<b>Flagyl</b>	<b>Metronidazole</b>

- \*No alcohol products, including mouthwash, aftershave, deodorant, bath splashes.
- Disulfiram- type reaction may occur (flushing, nausea, vomiting, palpitations).
  - $\beta$ -LACTAMS
  - $\beta$ -Lactam antibiotics include: PCNs, cephalosporins, monobactams, carbapenems
- \*Assess for allergies to any  $\beta$ -Lactam antibiotic

## CEPHALOSPORINS

Brand Name	Generic Name
<b>Rocephin</b>	<b>Ceftriaxone</b>
<b>Maxipime</b>	<b>Cefepime</b>
<b>Mefoxin</b>	<b>Cefoxitin</b>
<b>Ancef</b>	<b>Cefazolin</b>

# Need to know medications for NCLEX VII

## PENICILLINS

Brand Names	Generic Names
<b>Amoxil</b>	<b>Amoxicillin</b>
<b>Omnipen</b>	<b>Ampicillin</b>
<b>Unipen</b>	<b>Nafcillin</b>
<b>Pipracil</b>	<b>Piperacillin</b>
<b>Zosyn</b>	<b>Piperacillin/Tazobactam</b>

## SULFONAMIDES

Brand Names	Generic Names
<b>Bactrim</b> <b>Bactrim DS</b> <b>Septra</b>	<b>SMZ-TMP</b> <b>Trimethoprim-Sulfa</b> <b>methoxazole</b>

\*Avoid or use with extreme caution if allergic to sulfa: Erythromycin-Sulfisoxazole, Sulfasalazine, Dapsone, Sulfonamides, Celebrex, Imitrex, Lasix, Hydrochlorothiazide HCTZ

## VANCOMYCIN

Brand Names	Generic Names
<b>Vancocin</b>	<b>Vancomycin</b> <b>Hydrochloride</b>

- \*Nephrotoxicity, Ototoxicity, Red-Man Syndrome
- \*Peak: 30 minutes to 1 hour after administration.
- \*Trough: 30 minutes before the next dose.

## CARBAPENEMS

Brand Names	Generic Name
<b>Invanz</b>	<b>ErtapenemSulfate</b>
<b>Merrem</b>	<b>MeropenemSulfate</b>
<b>Primaxin</b>	<b>ImipenemSulfate</b>

## FLUOROQUINOLONES (oxacin)

Brand Names	Generic Name
<b>Cipro</b>	<b>Ciprofloxacin</b>
<b>Levaquin</b>	<b>Levofloxacin</b>

- \*Tendon rupture.
- \*Adjust dosage for renal patients.

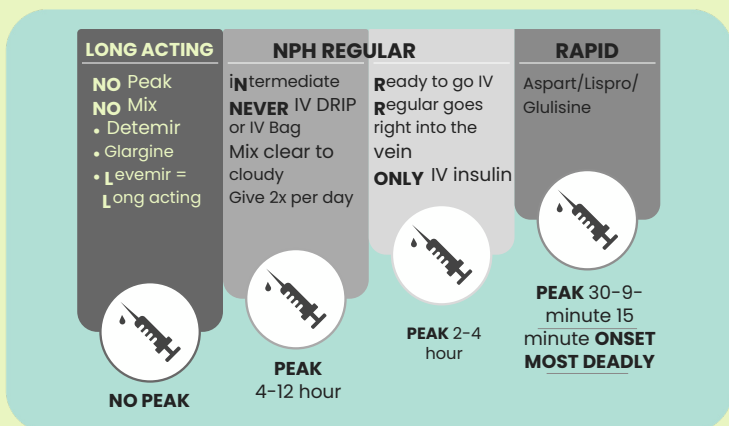
## TETRACYCLINES

Brand Names	Generic Name
<b>Tetracycline</b>	<b>Tetracycline</b>
<b>Vibramycin</b>	<b>Doxycycline</b>

# Need to know medications for NCLEX VIII

## INSULINS

Controls blood glucose by transporting glucose into cells promoting conversion of glucose to glycogen inhibiting the liver from changing glycogen to glucose



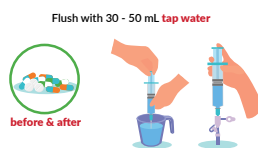
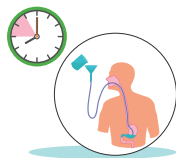
Rapid Acting	Insulin Lispro-Humalog
Short Acting	Regular Insulin-Humulin R • Regular insulin is the only one given IV • Concentrated insulin-Insulin U-500
Intermediate-Acting	NPH-Humulin N, Novolin R
Long-Acting	Insulin Glargine-Lantus • Cannot mix with others Insulin Detemir-Levemir
Premixed	NPH/REG• Humulin 50/50• Humulin 70/30• Novolin 70/30 Aspart protamine/aspart• Novolog Mix 70/30 Lispro protamine/lispro• Humalog Mix 75/25

Names	Onset	Peak	Duration
Lispro (Humalog)	5m	60-90min	4-6h
Aspart (Novolog)	10-20m	1-3h	3-5h
Regular (Humulin R)	SQ: 30-60m IV: 10-30m	SQ: 2-4h IV: 15-30m	SQ: 5-7h IV: 30-60m
U-500	2-3h	5-7h	
NPH (Humulin N, Novolin R)	1-2h	18-24h	
Glargine (Lantus)	None	24h	
Detemir (Levemir)	3-14h	24h	
NPH (Humulin 50/50, Humulin 70/30, Novolin 70/30)	4-8h	24h	
Aspart Protamine/aspart (Novolog mix 70/30)	1-4h	24h	
Lispro Protamine/lispro (Humalog mix 75/25)	2.8h	24h	

# Neurological Top Missed Questions

Which nursing action(s) are appropriate for a nurse preparing to administer **phenytoin** via a nasogastric (NG) tube? **Select all that apply.**

- ☒ 1. Hold tube feedings for at least one hour prior to administration.
- ☒ 2. Flush the nasogastric tube with 30 mL tap water before and after administration.
- ☐ 3. Monitor blood pressure and heart rate every 15 minutes for two hours after administration.
- ☒ 4. Monitor liver function tests on a regular basis for patients taking phenytoin.
- ☐ 5. Administer phenytoin at the onset of new seizure activity.



#### KEY POINTS

- 10-20 mcg/dl Therapeutic Range
- Below 10 - Seizure Risk - REPORT TO HCP!
  - OVER 20 - Toxic Risk - HOLD MED & notify HCP!
  - Routine Blood Tests "blood levels monitored routinely"

Which adverse effects of **phenytoin** should the nurse immediately report to the provider? **Select all that apply**

- ☒ 1. New reports of feeling "unsteady" when ambulating.
- ☒ 2. The appearance of a new rash on the patient's chest.
- ☒ 3. Reports of feeling hopeless and apathetic.
- ☒ 4. A morning phenytoin level of 26 mg/ dL.
- ☒ 5. Difficulty forming words and sentences.



The health care provider has prescribed 4 mg **succinylcholine** to be administered IV push during a rapid sequence intubation. Which is the nurse's **priority action** when preparing to administer this medication?

- ☐ 1. Check the patient's core body temperature.
- ☒ 2. Ask the patient about a history of alcohol abuse.
- ☐ 3. Prepare a dose of midazolam as prescribed for sedation.
- ☐ 4. Ensure that a non-rebreather mask is at the bedside prior to administration.



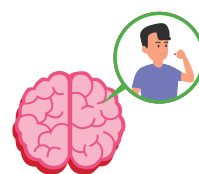
#### KEY POINT

- Screen for **HIGH RISK - MH**
1. Prior reaction to general anesthesia **MOST CRITICAL**
  2. Blood relatives with significant reaction to general anesthesia
  3. Alcoholics **HESI**

Which instruction(s) should the nurse include in the plan of care for a patient newly prescribed **carbidopa-levodopa** for the treatment of Parkinson Disease? **Select all that apply.**

- ☐ 1. "If you don't notice improvement in your symptoms within one week, notify your provider."
- ☒ 2. "When going from a sitting to a standing position, be sure to change your position slowly."
- ☒ 3. "It is a good idea to remove any extra clutter from your home that could cause you to trip and fall."
- ☐ 4. "Call your provider if you notice that your urine changes to a slightly reddish color."
- ☒ 5. "Avoid eating meals that contain large amounts of protein while taking this medication."

**LEAVE**odopa



# Immunosuppressants NCLEX Questions

## Indication:

Given to help the body **STOP** attacking itself - like in clients with **autoimmune diseases**

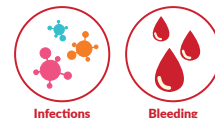


## Bad News:

Bone marrow suppression =

1. Low WBC = **Infection** Risk
2. Low Plt = **Bleed** Risk

## NCLEX TIPS



## Common NCLEX Question

A patient is prescribed **methotrexate** for treatment of an autoimmune disorder. Which patient report requires immediate assessment and intervention by the nurse?

- ☐ A. "I will consult with my provider before discontinuing birth control."
- ✓ ☒ B. "I noticed that I have developed tiny reddish-purple lesions all over my arms."
- ☐ C. "I have not had a normal bowel movement in two days."
- ☐ D. "I seem to be losing an excessive amount of hair since starting this medication."

What should the nurse include in teaching for a patient newly prescribed **hydroxychloroquine** for the treatment of systemic lupus erythematosus? **Select all that apply.**

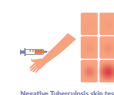
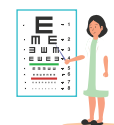
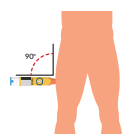
- ☐ 1. Ensure to see your optometrist at least every 2 years.
- ✓ ☒ 2. Report any new visual changes to your provider.
- ☐ 3. This medication is likely to increase feelings of fatigue associated with lupus.
- ☐ 4. Notify your provider if no improvement in symptoms is noticed within one week of beginning this medication.

The nurse is instructing a patient with a severe allergy to wasp stings on the proper use of the **epinephrine auto-injector**. Which patient statement **best** demonstrates that teaching has been effective?

- ☐ 1. "I will keep my epi-pen stored in my refrigerator at all times."
- ✓ ☒ 2. "I will inject the medication into my outer thigh at the first sign of an allergic reaction."
- ☐ 3. "I will seek follow-up treatment within 24 hours of injecting the medication."
- ☐ 4. "I will hold the epi-pen firmly in place for at least 5 seconds to ensure full delivery of the medication."

Which lab results should the nurse review prior to administration of **etanercept** to a patient with psoriatic arthritis? **Select all that apply**

- ✓ ☒ 1. Tuberculin skin test (TB skin test)
- ☐ 2. aPTT (partial thromboplastin time)
- ✓ ☒ 3. White blood cell count
- ☐ 4. Total cholesterol panel
- ✓ ☒ 5. Red blood cell count



## Notes

# Neuromuscular Blocking Agent

## Drug names:

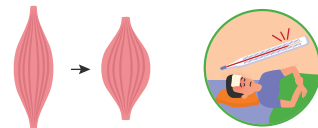
Succinylcholine  
Pancuronium  
Cisatracurium



## DEADLY Adverse Effect

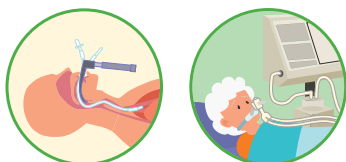
Malignant hyperthermia (MH)

- M - Muscle rigidity
- H - HOT



## Indication:

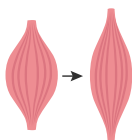
Given before intubation & mechanical ventilation.  
Like before surgery & in emergency settings



1. Notify HCP 2. IV dantrolene 3. Oxygen

## HESI

- Used to facilitate **mechanical ventilation**
- Produces **deep muscle relaxation** **NCLEX**



## HESI

- After admin succinylcholine ...  
high fever and muscle rigidity
- Prepare to give  
**IV DANTROLENE**



## HESI

- **MUST** give sedation!
- Primary result is flaccid paralysis - NOT loss of consciousness



## KEY POINT

Screen for **HIGH RISK - MH**

1. Prior reaction to general anesthesia **MOST CRITICAL**
2. Blood relatives with significant reaction to general anesthesia
3. Alcoholics **HESI**



## Notes

# Nitrates

## How it works? "Action"

The nitrates act by relaxing the smooth muscle layer of blood vessels, increasing the lumen of the artery or arteriole, and increasing the amount of blood flowing through the vessels. (Ford 382)

## Why do we give it? "Reason"

- Relieve pain of acute anginal attacks
- Prevent angina attacks (prophylaxis)
- Treat chronic stable angina pectoris (Ford 382)

## Adverse effects

- Central nervous system (CNS) reactions, such as headache (may be severe and persistent), dizziness, weakness, and restlessness
- Other body system reactions, such as hypotension, flushing (caused by dilation of small capillaries near the surface of the skin), and rash (Ford 382)

## Contraindications

- Hypersensitivity to the drugs, severe anemia, closed-angle glaucoma, postural hypertension, early myocardial infarction (sublingual form), head trauma, cerebral hemorrhage (may increase intracranial hemorrhage), allergy to adhesive (transdermal system), or constrictive pericarditis. Patients taking phosphodiesterase inhibitors (drugs for erectile dysfunction) should not use nitrates. (Ford 382)

## Nursing management

- The dose of sublingual nitroglycerin may be repeated every 5 minutes until pain is relieved or until the patient has received three doses in a 15-minute period. One to two sprays of translingual nitroglycerin may be used to relieve angina, but no more than three metered doses are recommended within a 15-minute period.
- Do not rub the nitroglycerin ointment into the patient's skin, because this will immediately deliver a large amount of the drug through the skin. Exercise care in applying topical nitroglycerin and do not allow the ointment to come in contact with your fingers or hands while measuring or applying the ointment, because the drug will be absorbed through your skin, causing a severe headache.
- The primary health care provider is notified if any of the following occur:
  - Heart rate of 20 bpm or more above the normal rate
  - Rapid weight gain of 5 lb or more
  - Unusual swelling of the extremities, face, or abdomen
  - Dyspnea, angina, severe indigestion, or fainting
- Avoid the use of alcohol unless use has been permitted by the primary health care provider.
- Notify your emergency response providers if the drug does not relieve pain or if pain becomes more intense despite use of this drug.
- Follow the recommendations of the primary health care provider regarding frequency of use.
- Keep an adequate supply of the drug on hand for events, such as vacations, bad weather conditions, and holidays.
- Keep a record of the frequency of acute anginal attacks (date, time of the attack, drug, and dose used to relieve the acute pain), and bring this record to each primary health care provider or clinic visit.

## Interactions:

- **Aspirin:** Increased nitrate plasma concentrations and action may occur
- **Calcium channel blockers:** Increased symptomatic orthostatic hypotension
- **Dihydroergotamine:** Increased risk of hypertension and decreased antianginal effect
- **Heparin:** Decreased effect of heparin
- **Phosphodiesterase inhibitors:** Severe hypotension and cardiovascular collapse may occur
- **Alcohol:** Severe hypotension and cardiovascular collapse may occur

Generic	Trade	Use	Route
Isosorbide	Isordil, Dilatate SR, Monoket	Treatment and prevention of angina	Initial dose 5–20 mg orally; maintenance dose 10–40 mg BID, TID orally Sublingually: 2.5–5 mg Prevention: 5–10 mg sublingually, 5 mg chewable

# NSAIDS

## Drug name:

<b>N</b>	Naproxen <b>NCLEX TIP</b>
<b>S</b>	Salicylate acid (Aspirin)
<b>A</b>	Acetylsalicylic acid (Aspirin)
<b>I</b>	Ibuprofen & Indomethacin
<b>K</b>	Ketorolac (brand: Toradol) <b>NCLEX TIP</b>

## Indication:

Anti-inflammatory & Antipyretic (Fever reducer)

## MOA:

Decrease prostaglandin response to decrease pain & inflammation

## HESI Question

Gout teaching effective  
"I can use **ibuprofen** or **naproxen** for pain"

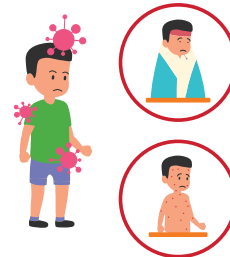
## ATI Question

Patient with rheumatoid **arthritis**, **NSAIDS** relieve the symptoms



## Aspirin Pt Education:

- **A - Aspirin**
- **A - Avoid Kids** **NCLEX TIPS**  
= possible Reye's Syndrome
- Early sign of toxicity is Tinnitus  
- report to HCP



## NCLEX Question

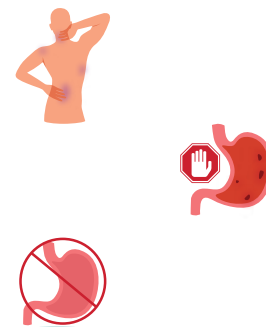
- Pt. with **asthma** or nasal polyps
- Use **acetaminophen** instead of an NSAID



## NOTIFY HCP

### KEY Words

- Easy bruising
- Tarry Stool & coffee-ground emesis = GI bleed
- AVOID - "Peptic Ulcer" (GI bleeding)
- Take medicine with food
- NEVER EMPTY STOMACH



## Kaplan Question

"increased bleed risk"



## HESI Question

- Ibuprofen
- Do **NOT** take on an **empty stomach**. - **YES**
  - Patient with Acid reflux on Ranitidine (PPI) & NSAID - **YES** ok
  - "I take occasional ibuprofen for my knees" - **YES**



## HESI Question

Patient with HTN or CHF

"I will **call my HCP** before taking ibuprofen"



<b>N</b>	<b>NOT GOOD FOR BODY</b> (Kidneys, Heart Failure, Asthma, GI, clots ect)
<b>S</b>	<b>STICKY BLOOD "CLOTS"</b> Increased risk for thrombosis
<b>A</b>	<b>ASTHMA WORSENING</b>
<b>I</b>	<b>INCREASED BLEED RISK!</b>
<b>D</b>	<b>DYSFUNCTIONAL KIDNEYS</b> Renal Injury (long term use) Creatinine over 1.3, Urine output 30ml/hr or Less
<b>S</b>	<b>SWELLING HEART</b> CHF (heart failure) & HTN worsening

## Notes

# Opioids

## Drug name:

### Opioids – O's

- mOrphine Sulfate
- HydrOmOrphOne
- cOdeine
- Oxycontin
- OxycOdOne
- Fentanyl

### Memory Trick

**Opioids**  
**LOW & SLOW**

## OXycodone

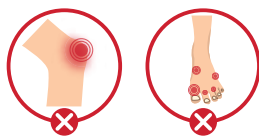
### KEY WORDS

- "As Scheduled"  
"Around the clock"
- "Not reporting pain"
- Together with other pain meds



## Indication:

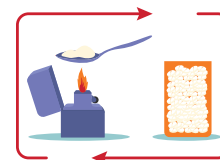
Severe pain (not anti inflammatory/antipyretic)



## Antidote:

### Naloxone (brand: Narcan)

Reversal agent for opioid & heroin overdose



### Killer Adverse Effects

- **Low RR - respiratory depression**

#### KEY Number:

Hold dose for RR **below 12**

- **Low BP – Hypotension**  
"orthostatic Hypotension"

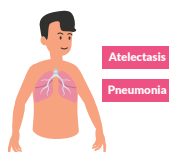
#### KEY Terms:

- If client becomes dizzy/ light headed  
**Assist to a seated position!**
- **DO NOT** get up unassisted

- **Low Brain - CNS sedation**

#### KEY Terms:

- Easily falls asleep when talking
- Unarousable



### KEY POINT

- **1-2 hours** Half Life
- Reassess **Every 60 minutes**



### Key terms

- RR below 12
- Unarousable
- Falling asleep while talking to you
- **Prepare for second dose of Narcan!**
- **Notify HCP**

## Long term Side Effects

### CONSTIPATION

#### KEY TERM

- PRN stool softeners
- **TEACH** preventative measures!



**A**

Assess ABCs  
**1st**

**ABC**

**I**

Intervention: Oxygen  
**2nd**

**Oxygen**

**M**

Make HCP aware  
**3rd**

**HPC**

**S**

Second dose of naloxone  
**4th**

**NARCAN**

## Greatest Risk DEATH

- "Advanced Age"  
(70 and older)
- Underlying pulmonary disease (**COPD, Asthma**)
- **Post Surgery (24 hours)**



## IV ADMINISTRATION

- 2 - 3 Minutes IV Push
- **NOT** over 5 - 10 seconds!!
- Reassess after 15 - 30 minutes
- **NOT** after 1 hour

## Notes

# Osmotic Diuretic Mannitol

## Drug name:

**Mannitol**



## Indication:

Decreases cerebral edema resulting in increased ICP: head injury, brain swelling, etc.

Decreases intraocular pressure - glaucoma emergencies



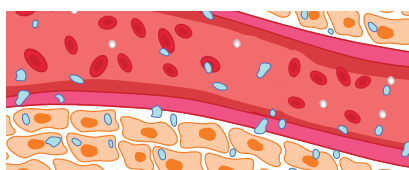
## Memory Trick:

- Mannitol
- Man ICP hurts or Man Eyes hurt



## MOA:

Drains fluid out of brain cells & into vascular space = HIGH RISK for fluid volume overload (too much fluid in the body)



## ATI

- Give **Mannitol** for increased ICP
- Assess LOC every hour



## HESI

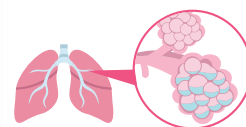
- **Mannitol**: Used to decrease ICP
- IV admin - cannot be given PO
- **Side effect** - Edema
- Begins 30 - 60 minutes after administration.



## ATI

### Mannitol

- Monitor for s/s heart failure:  
Bibasilar crackles,  
pulmonary edema



## Side Effect:



Heart Failure



Heavy Fluid

**HF =**

Heart failure

Heavy Fluid all over the body

## Notes

# Anticonvulsants

## - Oxazolidinedione

### How do they work? "Action"

**Oxazolidinones** decrease repetitive synaptic transmissions of nerve impulses.

### Indications

- Seizures of all types
- Neuropathic pain
- Bipolar disorders
- Anxiety disorders

### Adverse Reactions

- Nystagmus (constant, involuntary movement of the eyeball)
- Ataxia (loss of control of voluntary movements, especially gait)
- Slurred speech
- Gingival hyperplasia (overgrowth of gum tissue)

### Contraindications

Oxazolidinones have been associated with serious adverse reactions and fetal malformations. They should be used only when other, less toxic drugs are not effective in controlling seizures.

### Interactions

- **Antibiotics/antifungals:** Increased effect of the anticonvulsant
- **Tricyclic antidepressants:** Increased effect of the anticonvulsant
- **Salicylates:** Increased effect of the anticonvulsant
- **Cimetidine:** Increased effect of the anticonvulsant
- **Theophylline:** Decreased serum levels of the anticonvulsant
- **Antiseizure medications:** May increase seizure activity
- **Protease inhibitors:** Increased carbamazepine levels, resulting in toxicity
- **Oral contraceptives:** Decreased effectiveness of birth control, resulting in breakthrough bleeding or pregnancy
- **Analgesics or alcohol:** Increased depressant effect
- **Antidiabetic medications:** Increased blood glucose levels

### Fun Fact

- Research suggests an association between the use of anticonvulsants by pregnant women with epilepsy and an increased incidence of birth defects. The use of anticonvulsants is not discontinued in pregnant women with a history of major seizures because of the danger of precipitating status epilepticus. However, when seizure activity poses no serious threat to the pregnant woman, the primary health care provider may consider discontinuing use of the drug during pregnancy.
- Recurrence of seizure activity may result from abrupt discontinuation of the drug, even when the anticonvulsant is being administered in small daily doses
- Hematologic changes (e.g., aplastic anemia, leukopenia, and thrombocytopenia) need to be reported immediately. Teach the patient how to identify signs of thrombocytopenia (bleeding gums, easy bruising, increased menstrual bleeding, tarry stools) or leukopenia (sore throat, chills, swollen glands, excessive fatigue, or shortness of breath) and to contact the primary health care provider..

### Nursing management

- This drug may cause photosensitivity. Take protective measures (e.g., wear sunscreens and protective clothing) when exposed to ultraviolet light or sunlight until tolerance is determined.
- Notify the primary health care provider if the following reactions occur: visual disturbances, excessive drowsiness or dizziness, sore throat, fever, skin rash, pregnancy, malaise, easy bruising, epistaxis, or bleeding tendencies.
- Avoid pregnancy while taking trimethadione; the drug has caused serious birth defects.

#### Generic

Trimethadione

#### Trade

Tridione

#### Dose

Epilepsy

#### Use

900 mg–2.4 g/day orally in equally divided doses

# Uterine Drugs

## - Oxytocics

### How do they work? "Action"

Uterine stimulants increase the strength, duration, and frequency of uterine contractions and decrease the incidence of uterine bleeding. They are given after the delivery of the placenta and are used to prevent postpartum and postabortal hemorrhage caused by uterine atony (marked relaxation of the uterine muscle). These drugs include carboprost, methylergonovine, and misoprostol. (Ford 506)

Oxytocin is an endogenous hormone produced by the posterior pituitary gland. This hormone has uterus-stimulating properties, acting on the smooth muscle of the uterus, especially on the pregnant uterus.

### Adverse Reactions

**Administration of oxytocin may result in the following:**

- Fetal bradycardia, uterine rupture, uterine hypertonicity
- Nausea, vomiting, cardiac arrhythmias, anaphylactic reactions
- Oxytocin is similar to the hormone vasopressin and because of its antidiuretic effect, serious water intoxication (fluid overload, fluid volume excess) may occur.

**Adverse reactions associated with other uterine stimulants include the following:**

- Nausea, vomiting, diarrhea
- Elevated blood pressure, temporary chest pain
- Dizziness, water intoxication, headache
- Allergic reactions may also occur. In some instances hypertension associated with seizure or headache may occur. (Ford 506)

### Contraindications

**Oxytocin**

- Cephalopelvic disproportion
- Unfavorable fetal position or presentation.
- Also contraindicated in obstetric emergencies, situations of fetal distress when delivery is not imminent
- Severe preeclampsia, eclampsia, and hypertonic uterus,
- During pregnancy when there is total placenta previa.
- It is contraindicated as an agent to induce labor when vaginal delivery is contraindicated

**Other uterine stimulants**

- Methylergonovine is not used before delivery of the placenta.
- It is contraindicated in those with known hypersensitivity to the drug or hypertension. (Ford 506)

### Indications

- Prevent postpartum and postabortal hemorrhage caused by uterine atony
- Induce an early vaginal delivery when there are fetal or maternal problems, such as a woman with diabetes and a large fetus, Rh problems, premature rupture of the membranes, uterine inertia, and preeclampsia
- Managing inevitable or incomplete abortion

### Nursing management

When **oxytocin** is administered with vasopressors, however, severe maternal hypertension may occur.

- Obtain an obstetric history (e.g., parity, gravidity, previous obstetric problems, type of labor, stillbirths, abortions, live-birth infant abnormalities) and a general health history.
- Keep a record of the activity of the uterus (strength, duration, and frequency of contractions, if any).
- All patients receiving IV oxytocin must be under constant observation to identify complications. In addition, the health care provider attending the delivery should be immediately available at all times.

**When monitoring uterine contractions, immediately stop the oxytocin infusion and notify the health care provider attending the delivery immediately if any of the following occurs:**

- A significant change in the FHR or rhythm
- A marked change in the frequency, rate, or rhythm of uterine contractions; uterine contractions lasting more than 60 seconds; or contractions occurring more frequently than every 2 to 3 minutes, or no palpable relaxation of the uterus
- A marked increase or decrease in the patient's blood pressure or pulse or any significant change in the patient's general condition (vital signs are typically obtained every 15 to 30 minutes in active labor)

**Other uterine stimulants**

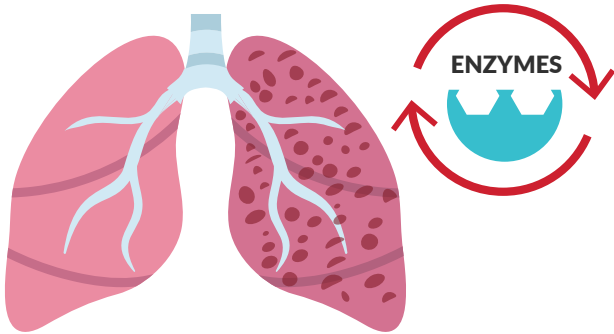
- When the patient is to receive any of these drugs after delivery, it is important to take the blood pressure, pulse, and respiratory rate before administration. (Ford 507)
- Methylergonovine is administered for uterine atony and hemorrhage, abdominal cramping can occur and is usually an indication of drug effectiveness. The uterus is palpated in the lower abdomen as small, firm, and round. However, report persistent or severe cramping to the primary health care provider. (Ford 508)

Generic	Trade	Dose	Use
<b>Methylergonovine</b>	Methergine	Control of postpartum bleeding and hemorrhage, uterine atony	0.2 mg IM, IV after delivery of the placenta; 0.2 mg orally TID, QID
<b>Misoprostol</b>	Cytotec	Postpartum hemorrhage, cervical ripening	100-mcg tablet vaginally administered
<b>Oxytocin</b>	Pitocin	Antepartum: to initiate or improve uterine contractions Postpartum: control of postpartum bleeding and hemorrhage	Induction of labor: individualize dose not to exceed 10 units/min Postpartum bleeding: IV infusion of 10–40 units in 1000-mL IV solution or 10 units IM after placenta delivery

# Pancrelipase Enzymes

## Indication:

Given to replace digestive enzymes in patients with cystic fibrosis

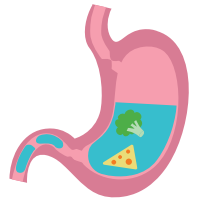


## MOA:

- Enzymes help break down food
- end in "-ase"

## Helps break down food

- Lipase → Fat
- Protease → Protein
- Amylase → Carb



## KEY POINTS

**MUST** be eaten  
**WITH every Meal & Snack**  
or med is not effective

- NOT before
- NOT After

## Kaplan Question

### Pancrelipase Admin:

Open capule &  
sprinkle contents on  
food without chewing



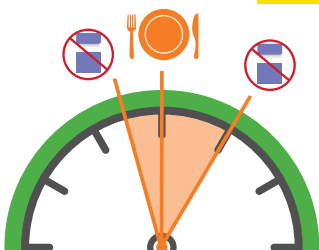
## HESI Question

### Pancrelipase Admin:

Reduction in fatty  
stools is an expected  
outcome



## KEY TERM



## Notes

# Patient Teaching

## Bleeding

### Key Numbers:

#### Heparin



**H** Therapeutic Range  
**46 – 70 PTT**

Memory Trick:  
“HePTT” the FROG

**H** – Heparin  
**P** – Protamine Sulfate (Antidote)  
**PTT** – 46 – 70 Max range

\*FAST onset = Frogs are FAST

#### Warfarin



**WAR** Therapeutic Range  
**2 – 3 INR**

Memory Trick:  
“War-K-IN”

**W** – Warfarin  
**K** – Vitamin K (Antidote)  
**IN** – INR 2-3 range

\*Slow onset = “Is it even WARkin?”

### Nursing Care:

#### BLEEDING PRECAUTIONS

- **NO** Active Bleed
- “peptic ulcer” **NCLEX TIP**

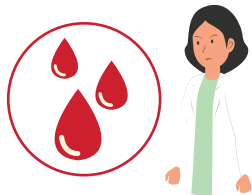
#### CHANT

**C** - Cirrhosis  
**H** - Hepatitis  
**A** - Alcohol **HESI EXAM**  
**N** - NSAIDS **ATI EXAM**  
**T** - Tylenol overdose -  
Liver damage

#### NO EGGGOS

**E** - Vitamin E  
**G** - Ginseng  
**G** - Ginkgo Biloba  
**G** - Garlic  
**O** - Omega 3  
**S** - St Johns Wort

**SIGNS OF BLEEDING**  
**NOTIFY the HCP ASAP!!**



#### KEY WORDS

- Black Tarry Stools - GI bleed
- Hematuria (blood tinged urine)
- Epistaxis - nose bleed
- Petechiae on chest
- Easy Bruising

**P**

AsPirin



**P**

CloPidogrel



**P**

EnoxaParin



#### Platelets

- “Less than **50k** = Risky”
- Thrombocytopenia  
**HOLD** All heParin
- **50,000**



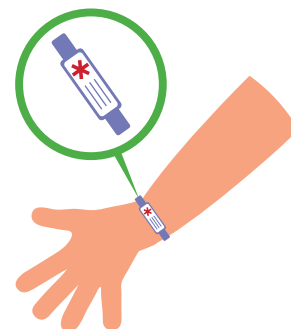
< 50,000



#### AVOID Trauma: **HESI KEY TERMS**

- NO** small rugs or dim halls  
= Well Light Halls
- NO** hard brushing  
= soft bristle tooth brush
- NO** flossing
- NO** alcohol based mouth wash
- NO** razors = electric shaver
- NO** constipation = Fiber + Fluids **NCLEX TIP**
- NO** contact sport

**Medic Alert Braclet**



### Notes

# PCA Pump vs. Fentanyl

## Drug name:

**Patient Controlled Analgesia Pump**



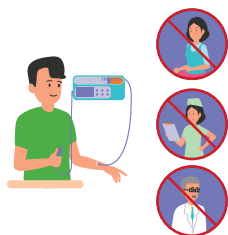
## Indication:

Used for pain control after surgery or long term recovery



## Key Points

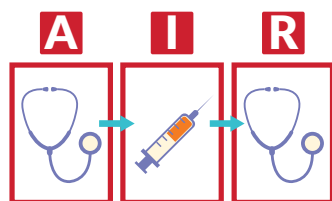
- Client **ONLY**
- **NOT** family
- **NOT** nurse
- **NOT** Dr.



## NCLEX TIPS

### Nursing Care

- Twice the dose of Meds given
- If patient still reports pain
- **1 st action = pain ASSESSMENT**



## AIR

- **A** - Assessment before **1st!**
- **I** - Intervention
- **R** - Re-assessment

## Drug name:

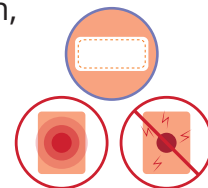
**Fentanyl**



## Indication:

Given for chronic "persistent" pain, **NOT** used for acute pain

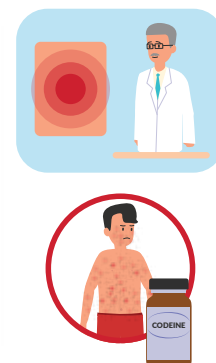
- **P** - Patches
- **P** - Persistent Pain



Can take up to 17 hours for full effect

## KEY Words

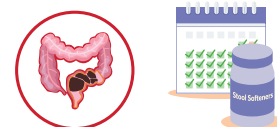
- Not "Acute" Pain:
  - **NOT** Post-op pain **NCLEX TIP**
  - **NOT** Intermittent pain **NCLEX TIP**
 Clarify order with HCP!
- **Appropriate for allergy to codeine**



## Kaplan Question

### Fentanyl Patch

"**constipation**  
= use stool softeners"



## ATI Question

### Fentanyl Patch

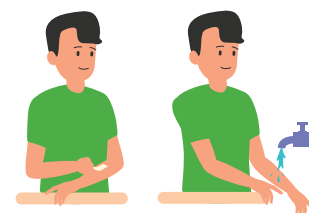
"**Tolerance**  
= need increase doses  
for pain relief"



## HESI Question

### Fentanyl Patch

- **"REMOVE** old patch **BEFORE** new one"
- Clean area
- Dry skin



## Notes

# Penicillin & Cephalosporins

**Penicillin**  
Amoxicillin  
Ampicillin  
Piperacillin Tazobactam

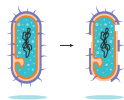
**Cephalosporins**  
▪ **Ceph**alexin (brand: Keflex) **NCLEX TIP**  
▪ **Cef**azolin  
▪ **Cef**triaxone (brand: Rocephin)

Penicillin end in **CILLIN**

Cephalosporins start with **CEPH**

## MOA:

Weakens bacteria cell wall



## Patient teaching:

### Key Words

- Oral contraceptives are ineffective
- Use additional contraception

Penicillin cause accidental pregnancy since it BUMPS the PILL



Both are **PREGNANCY SAFE** and **BREASTFEEDING SAFE**

### Administration

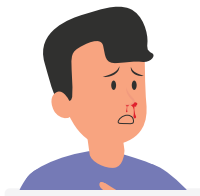
- "-Cillin"
- KEY Terms:**
  - Take with food** if GI upset (nausea/ vomiting/diarrhea)
  - Shake well** before use

## COMMON SIDE EFFECTS

**-Ceph = Diarrhea**



**-Cillins = Bleeding**  
(monitor platelet count)



## KEY POINT & MEMORY TRICK

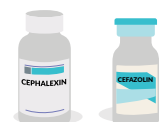
**C**

**CROSS SENSITIVITY**  
(ALLERGY)



**C**

**CEPH / CEF**  
(CEPHALEXIN, CEFZOLIN)



**C**

**CILLIN**  
(AMOXACILLIN)

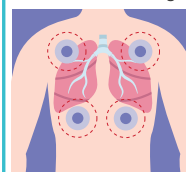


## DURING A REACTION

**STOP**  
("HOLD") MEDICATION



**ASSESS**  
the type of reaction  
• Auscultate Lungs



**EPINEPHRINE**  
(prepare to admin)



**Anaphylaxis allergy:**  
"-Cillins" & "Ceph"  
Nurse should  
**CLARIFY PRESCRIPTION**



## Common NCLEX Question

What is the best action for the nurse to take before administering amoxicillin to a patient with allergies to levofloxacin & ceftriaxone.

- ☐ 1. Clarify the order with pharmacy
- ☒ 2. Ask the patient about the type of reaction they have to ceftriaxone.
- ☐ 3. Notify the HCP of the allergy to ceftriaxone.
- ☐ 4. Administer meds separately with normal saline in between.

## Notes

# Drugs that disrupt the cell wall: Penicillins

## How do they work? "Action"

Penicillin is a widely used antibiotic prescribed to treat staphylococci and streptococci bacterial infections. Penicillin belongs to the beta-lactam family of antibiotics, the members of which use a similar mechanism of action to inhibit bacterial cell growth that eventually kills the bacteria

## Indications

- Urinary tract infections (UTIs)
- Septicemia
- Meningitis
- Intra-abdominal infections
- Sexually transmitted infections (syphilis)
- Pneumonia and other respiratory infections
- Prophylaxis for anticipated bacterial infections

## Adverse Reactions

- Glossitis (inflammation of the tongue) when given orally
- Stomatitis (inflammation of the mouth), dry mouth
- Gastritis
- Nausea, vomiting
- Diarrhea, abdominal pain
- An anaphylactic reaction
- Anemia (low red blood cell count)
- Thrombocytopenia (low platelet count)
- Leukopenia (low white blood cell count)
- Bone marrow depression

## Contraindications & Caution

- Hypersensitivity to penicillin or cephalosporins

## Interactions:

- Oral contraceptives (with estrogen): Decreased effectiveness of contraceptive agent (with ampicillin, penicillin V).
- Tetracyclines: Decreased effectiveness of penicillins
- Anticoagulants: Increased bleeding risks (with large doses of penicillins)
- $\beta$ -adrenergic blocking drugs: May increase the risk for an anaphylactic reaction

## Contraindications & Caution

- **Augmentin** - combination of amoxicillin and clavulanic acid
- **Timentin** - combination of ticarcillin and clavulanic acid
- **Unasyn** - combination of ampicillin and sulbactam
- **Zosyn** - combination of piperacillin and tazobactam (Ford 71)

## Nursing management

- View the culture and sensitivity results
- Monitor symptoms of hypersensitivity or anaphylaxis
- Prophylaxis—Take the drug as prescribed until the primary health care provider discontinues therapy.
- Infection—Complete the full course of therapy. Do not stop taking the drug, even if the symptoms have disappeared.
- Take the drug at the prescribed times of day because it is important to keep an adequate amount of drug in the body throughout the entire 24 hours of each day.
- Penicillin (oral)—Take the drug on an empty stomach either 1 hour before or 2 hours after meals (exceptions: penicillin V and amoxicillin).
- Take each dose with a full 8-ounce glass of water.
- Avoid drinking alcoholic beverages when taking the cephalosporins and for 3 days after completing the course of therapy, because severe reactions may occur.
- To reduce the risk of superinfection during antibiotic therapy, take yogurt, buttermilk, or Acidophilus capsules.
- If you are a woman who has been prescribed ampicillin and penicillin V and who takes birth control pills containing estrogen, use additional contraception measures.
- Notify the primary health care provider immediately should one or more of the following occur: skin rash; hives (urticaria); severe diarrhea; vaginal or anal itching; black, furry tongue; sores in the mouth; swelling around the mouth or eyes; breathing difficulty; or GI disturbances such as nausea, vomiting, and diarrhea. Do not take the next dose of the drug until the problem has been discussed with the primary health care provider.
- Never give this drug to another individual even though his or her symptoms appear to be the same as yours.
- Never skip doses or stop therapy unless told to do so by the primary health care provider (see Patient Teaching for Improved Patient Outcomes: Preventing Anti-Infective Resistance). When a penicillin is to be taken for a long time for prophylaxis, you may feel well despite the need for long-term antibiotic therapy. There may be a tendency to omit one or more doses or even neglect to take the drug for an extended time. (Ford 77)

## Herbal Considerations

Goldenseal (*Hydrastis canadensis*) is an herb found growing in certain areas of the northeastern United States, particularly the Ohio River valley. Goldenseal has been used to wash inflamed or infected eyes and in making yellow dye. There are many more traditional uses of the herb, including as an antiseptic for the skin, as a mouthwash for canker sores, and in the treatment of sinus infections and digestive problems such as peptic ulcers and gastritis. In the 19th century, goldenseal was touted as an "herbal antibiotic" for treating gonorrhea and UTIs. Though used over time by American Indian tribes as an insect repellent, stimulant, and diuretic, there is no scientific evidence to support its benefit for these purposes. Another myth surrounding goldenseal use is that taking the herb masks the presence of illicit drugs in the urine. Evidence does support the use of goldenseal to treat diarrhea caused by bacteria or intestinal parasites, such as *Giardia*. The herb is contraindicated during pregnancy and in patients with hypertension. Adverse reactions are rare when the herb is used as directed. However, this herb Anaphylaxis should not be taken for more than 1 week. (Ford 72)

Generic	Trade	Use	Dose
penicillin G (aqueous)	Pfizerpen	Infections due to susceptible microorganisms; meningococcal meningitis, septicemia	Up to 20–30 million Units/day IV or IM; dosage may also be based on weight
penicillin V	Veetids	Infections due to susceptible organisms	125–500 mg orally q 6 hr or q 8 hr

# PNS Drugs

## - Peripherally Acting Antiadrenergics

### How do they work? "Action"

Inhibits the release of norepinephrine from certain adrenergic nerve endings in the peripheral nervous system. (Ford 256)

### Indications

- Hypertension
- BPH

### Adverse Reactions

- Dry mouth, drowsiness, sedation, anorexia, rash, malaise, and weakness are generalized reactions to antiadrenergic drugs that work on the CNS.
- Hypotension, weakness, lightheadedness, and bradycardia are adverse reactions associated with the administration of peripherally acting antiadrenergic drugs. (Ford 257)

### Contraindications

The peripherally acting antiadrenergic drugs are contraindicated in patients with a hypersensitivity to any of the drugs. Reserpine (Serpasil) is contraindicated in patients who have an active peptic ulcer or ulcerative colitis and in patients who are mentally depressed.

### Interactions

- **Adrenergic drugs:** Increased risk of hypertension
- **Levodopa:** Decreased effect of the levodopa, hypotension
- **Anesthetic agents:** Increased effect of the anesthetic
- **$\beta$  blockers:** Increased risk of hypertension
- **Lithium:** Increased risk of lithium toxicity
- **Haloperidol:** Increased risk of psychotic behavior

### Education

Instruct patients to rise slowly from a sitting or lying position. Provide assistance for the patient getting out of bed or a chair if symptoms of postural hypotension are severe. Place the call light nearby and instruct patients to ask for assistance each time they get in and out of bed or a chair. Assist the patient in bed to a sitting position and have the patient sit on the edge of the bed for about 1 minute before ambulating. Help seated patients to a standing position and instruct them to stand in one place for about 1 minute before ambulating. Remain with the patient while he or she is standing in one place, as well as during ambulation. Instruct the patient to avoid standing in one place for prolonged periods. This is rarely a problem in the hospital but should be included in the patient and family discharge teaching plan. Teach the patient to avoid taking hot showers or baths, which tend to increase vasodilation. (Ford 259)

### Nursing management

- Do not stop taking the drug abruptly, except on the advice of the primary health care provider. Most of these drugs require that the dosage be gradually decreased to prevent precipitation or worsening of adverse effects.
- Notify the primary health care provider promptly if adverse drug reactions occur.
- Observe caution while driving or performing other hazardous tasks because these drugs ( $\beta$ -adrenergic blockers) may cause drowsiness, dizziness, or lightheadedness.
- Immediately report any signs of HF (weight gain, difficulty breathing, or edema of the extremities).
- Do not use any nonprescription drug (e.g., cold or flu preparations or nasal decongestants) unless you have discussed use of a specific drug with the primary health care provider.
- Inform dentists and other primary health care providers of therapy with this drug.
- Keep all primary health care provider appointments because close monitoring of therapy is essential.
- Check with a primary health care provider or clinical pharmacist to determine if the drug is to be taken with food or on an empty stomach. (Ford 259-260)

Generic	Trade	Use	Dose
Doxazosin	Cardura	Hypertension, BPH	Hypertension: 1–8 mg orally daily BPH: 1–16 mg orally daily
Prazosin	Minipress	Hypertension	1–20 mg orally daily in divided doses

# Anticonvulsants

## - Hydantoins

### How do they work? "Action"

**Hydantoins** stabilize the hyperexcitability postsynaptically in the motor cortex of the brain.

### Indications

- Seizures of all types
- Neuropathic pain
- Bipolar disorders
- Anxiety disorders

### Adverse Reactions

- Nystagmus (constant, involuntary movement of the eyeball)
- Ataxia (loss of control of voluntary movements, especially gait)
- Slurred speech
- Gingival hyperplasia (overgrowth of gum tissue)

### Contraindications

Phenytoin is contraindicated in patients with sinus bradycardia, sinoatrial block, Adams-Stokes syndrome, and second- and third-degree atrioventricular (AV) block; it also is contraindicated during pregnancy and lactation (ethotoin and phenytoin are pregnancy category D drugs).

### Interactions

- **Antibiotics/antifungals:** Increased effect of the anticonvulsant
- **Tricyclic antidepressants:** Increased effect of the anticonvulsant
- **Salicylates:** Increased effect of the anticonvulsant
- **Cimetidine:** Increased effect of the anticonvulsant
- **Theophylline:** Decreased serum levels of the anticonvulsant
- **Antiseizure medications:** May increase seizure activity
- **Protease inhibitors:** Increased carbamazepine levels, resulting in toxicity
- **Oral contraceptives:** Decreased effectiveness of birth control, resulting in breakthrough bleeding or pregnancy
- **Analgesics or alcohol:** Increased depressant effect
- **Antidiabetic medications:** Increased blood glucose levels

### Fun Fact

- Research suggests an association between the use of anticonvulsants by pregnant women with epilepsy and an increased incidence of birth defects. The use of anticonvulsants is not discontinued in pregnant women with a history of major seizures because of the danger of precipitating status epilepticus. However, when seizure activity poses no serious threat to the pregnant woman, the primary health care provider may consider discontinuing use of the drug during pregnancy.
- Recurrence of seizure activity may result from abrupt discontinuation of the drug, even when the anticonvulsant is being administered in small daily doses
- Hematologic changes (e.g., aplastic anemia, leukopenia, and thrombocytopenia) need to be reported immediately. Teach the patient how to identify signs of thrombocytopenia (bleeding gums, easy bruising, increased menstrual bleeding, tarry stools) or leukopenia (sore throat, chills, swollen glands, excessive fatigue, or shortness of breath) and to contact the primary health care provider..

### Nursing management

- Inform the dentist and other primary health care providers of use of this drug.
- Brush and floss the teeth after each meal and make periodic dental appointments for oral examination and care.
- Take the medication with food to reduce GI upset.
- Thoroughly shake a phenytoin suspension immediately before use.
- Do not take capsules that are discolored.
- Notify the primary health care provider if any of the following occurs: skin rash, bleeding, swollen or tender gums, yellowish discoloration of the skin or eyes, unexplained fever, sore throat, unusual bleeding or bruising, persistent headache, malaise, or pregnancy

Generic	Trade	Use	Dose
<b>Fosphenytoin</b>	N/A	Status epilepticus	Loading dose: 15–20 mg/kg IV Maintenance dose: 4–6 mg/kg/day IV
<b>Phenytoin</b>	Dilantin	Tonic-clonic seizures, status epilepticus, prophylactic seizure prevention	Oral: loading dose: 1 g divided into three doses prevention (400 mg, 300 mg, 300 mg) orally q 2 hr Maintenance dose: started 24 hr after loading dose, 300–400 mg/day Parenteral: 10–15 mg/kg IV

# Posterior Pituitary Hormones

## How do they work? "Action"

Vasopressin and its derivative, desmopressin (DDAVP), regulate the reabsorption of water by the kidneys. Vasopressin is secreted by the pituitary when body fluids must be conserved.

## Patho

This mechanism may be activated when, for example, an individual has severe vomiting and diarrhea with little or no fluid intake. When this and similar conditions are present, the posterior pituitary releases the hormone vasopressin, water in the kidneys is reabsorbed into the blood (i.e., conserved), and the urine becomes concentrated. Vasopressin exhibits its greatest activity on the renal tubular epithelium, where it promotes water reabsorption and smooth muscle contraction throughout the vascular bed. Vasopressin also has some vasopressor activity. (Ford 466)

## Indications

- Diabetes insipidus
- **Unlabeled Use:** Management of pulseless VT/VF unresponsive to initial shocks, asystole, or pulseless electrical activity (PEA) (ACLS guidelines). Vasodilatory shock. Gastrointestinal hemorrhage (Davis 1)

## Contraindications

Vasopressin is used cautiously in patients with a history of seizures, migraine headaches, asthma, congestive heart failure (HF), or vascular disease (because the substance may precipitate angina or myocardial infarction) and in those with preoperative polyuria. (Ford 467)

## Interactions:

- **Norepinephrine:** Decreased antidiuretic effect
- **Lithium:** Decreased antidiuretic effect
- **Oral anticoagulants:** Decreased antidiuretic effect
- **Carbamazepine:** Increased antidiuretic effect
- **Chlorpropamide:** Increased antidiuretic effect

## Adverse Reactions

- Tremor, sweating, vertigo
- Nasal congestion
- Nausea, vomiting, abdominal cramps
- Water intoxication

## Nursing management

- Before administering vasopressin to relieve abdominal distention, document the patient's blood pressure, pulse, and respiratory rate. Auscultate the abdomen and record the findings. Additionally, measure and document the patient's abdominal girth. (Ford 467)
- Excessive dosage is manifested as water intoxication (fluid overload). Symptoms of water intoxication include drowsiness, listlessness, confusion, and headache (which may precede convulsions and coma). If signs of excessive dosage occur, notify the primary health care provider before the next dose of the drug is due; a change in the dosage, the restriction of oral or IV fluids, and the administration of a diuretic may be necessary.
- Monitor fluid volume status
- Monitor vitals
- Monitor intake and output closely
- Monitor weight

Generic	Trade	Use	Dose
<b>Vasopressin</b>	None	Diabetes insipidus, hemophilia A, Von Willebrand's disease, nocturnal enuresis	Diabetes insipidus: 5–10 units IM, subcut q 3–4 hr, parenteral solution may be used intranasally
<b>Desmopressin</b>	DDAVP	Diabetes insipidus, hemophilia A, Von Willebrand's disease, nocturnal enuresis	Doses are individualized, administered orally, intranasally, or subcut

# Prenatal Folic Acid & Betamethasone

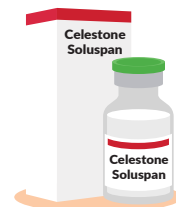
## Vitamin name:

**Folic Acid**



## Drug name:

**Betamethasone**



## Indication:

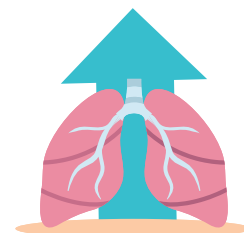


Given to prevent spina bifida:

- Prevention of **neural tube defects**
- Begin taking before pregnancy

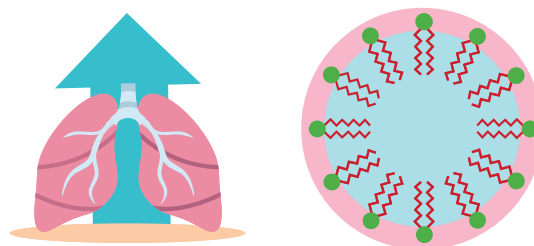
## Indication:

Helps lung development with preterm babies



## MOA:

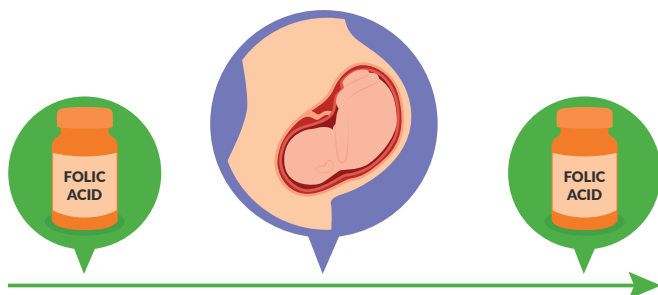
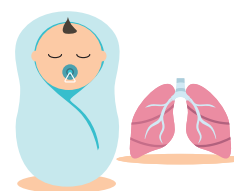
Increases **surfactant** production which helps lungs to expand



## ATI Question

### Evaluation of effectiveness

- Normal respiratory pattern in newborn



## Notes

# Progestins

## How do they work? "Action"

Progesterone is secreted by the corpus luteum, placenta, and (in small amounts) adrenal cortex. They transform the proliferative endometrium into a secretory endometrium. Progestins are necessary for the development of the placenta and inhibit the secretion of pituitary gonadotropins, which in turn prevents maturation of the ovarian follicle and ovulation. (Ford 494)

## Indications

- Treatment of amenorrhea,
- Endometriosis
- Functional uterine bleeding
- Progestins are also used as oral contraceptives, either alone or in combination with an estrogen (Ford 494)

## Adverse Reactions

- Breakthrough bleeding, spotting, change in menstrual flow, amenorrhea
- Breast tenderness, edema, weight increase or decrease
- Acne, chloasma or melasma, insomnia, mental depression (Ford 496)

## Contraindications

Estrogen and progestin therapy is contraindicated in patients with known hypersensitivity to the drugs, breast cancer (except for metastatic disease), estrogen-dependent neoplasms, undiagnosed abnormal genital bleeding, and thromboembolic disorders. The progestins also are contraindicated in patients with cerebral hemorrhage or impaired liver function. Both the estrogens and progestins are classified as pregnancy category X drugs and are contraindicated during pregnancy. (Ford 497)

## Interactions

- **Anticonvulsants or rifampin:**  
Decreased effectiveness of progestin
- **Penicillins or tetracyclines:**  
Decreased effectiveness of oral contraceptive

## Nursing management

- Monitor blood pressure, pulse, respiratory rate, and weight
- Estrogens may be administered orally, IM, intravenously (IV), transdermally, or intravaginally.
- Monitor for excess fluid volume and sodium retention
- Teach the patient how to monitor for signs of thromboembolic effects, such as pain, swelling, and tenderness in the extremities, headache, chest pain, and blurred vision. These adverse effects are reported immediately to the primary health care provider
- Carefully read the patient package insert available with the drug. If there are any questions about this information, discuss them with the primary health care provider.
- If GI upset occurs, take the drug with food.
- Notify the primary health care provider if any of the following occurs: pain in the legs or groin area; sharp chest pain or sudden shortness of breath; lumps in the breast; sudden severe headache; dizziness or fainting; vision or speech disturbances; weakness or numbness in the arms, face, or legs; severe abdominal pain; depression; or yellowing of the skin or eyes.
- If pregnancy is suspected or abnormal vaginal bleeding occurs, stop taking the drug and contact the primary health care provider immediately.
- Patient with diabetes: Check the blood glucose daily, or more often. Contact the primary health care provider if the blood glucose is elevated. An elevated blood glucose level may require a change in diabetic therapy (insulin, oral antidiabetic drug) or diet; these changes must be made by the primary health care provider. (Ford 500)

Generic	Trade	Use	Dose
<b>Progesterone</b>	prometrium	Endometrial hyperplasia (oral), amenorrhea, abnormal uterine bleeding (injection), infertility (gel)	Orally: 200 mg for 12 days of cycle IM: 5–10 mg/day for 6–8 days Gel: 90 mg/day
<b>Medroxyprogesterone</b>	Provera	Amenorrhea, abnormal uterine bleeding, endometrial hyperplasia	5–10 mg/day orally
<b>Norethindrone</b>	aygestin	Amenorrhea, abnormal uterine bleeding, endometriosis	2.5–10 mg/day for 5–10 days of cycle

# Urinary System Drugs

## - BPH Drugs

### How do they work? "Action"

**Peripherally acting,**  $\alpha$ 1a-adrenergic blockers that exert their action primarily on the smooth muscle of the prostate and the bladder neck. By blocking norepinephrine, the muscles relax and this allows urine to flow from the bladder. Adrenergic blockers can be uroselective ; therefore, the  $\alpha$ 1a-adrenergic blockers exert their action on the bladder with minimal action on the vascular system.

**Androgen hormone inhibitors** prevent the conversion of testosterone into the androgen 5- $\alpha$ -dihydrotestosterone (DHT). The growth of the prostate gland depends on DHT. The lowering of serum levels of DHT reduces the effect of this hormone on the prostate gland, resulting in a decrease in the size of the gland and the symptoms associated with prostatic gland enlargement. (Ford 519)

### Indications

Treatment and symptom control of BPH

### Adverse Reactions

#### A- adrenergic blockers:

- weight gain, fatigue, dizziness, and transient orthostatic hypotension.

#### Androgen hormone inhibitors

- impotence, decreased libido,
- decreased volume of ejaculate. Changes to breast tissue ,pain or tenderness, nipple discharge, or enlargement (Ford 520)

### Interactions

- **Antibiotics/antifungals:**  
Decreased effectiveness of anti-infective drug
- **$\beta$  blockers:** Increased hypotension
- **Phosphodiesterase type 5 inhibitors:**  
Increased hypotension

### Contraindications

- Uncontrolled angle-closure glaucoma
- Intestinal obstruction or atony
- Urinary retention.
- Both  $\alpha$ -adrenergic blockers and AHI drugs should be used with caution in patients with hepatic or renal disease. Caution the patient with hypertension when using both beta ( $\beta$ ) and  $\alpha$  blockers that hypotensive symptoms may be increased. (Ford 520)

### Nursing management

- Monitor voiding pattern and intake and output ratios
- Assess abdomen for bladder distention prior to and periodically during therapy.
- Catheterization may be used to assess postvoid residual.
- Cystometry is usually performed to diagnose type of bladder dysfunction prior to prescription of oxybutynin.
- **Geri:** Assess geriatric patients for anticholinergic effects (sedation and weakness).

### Herbal Consideration

Saw palmetto is used to relieve the symptoms of BPH (urinary frequency, decreased flow of urine, and nocturia). The herb is believed to reduce inflammation and the hormone DHT (responsible for prostate enlargement). Saw palmetto does not cause impotence, yet it can aggravate GI disorders such as peptic ulcer disease. Men report reduction in urinary symptoms in 1 to 3 months when 160 mg twice daily is taken. It is not recommended as a tea, because the active constituents are not water soluble. It is usually recommended that the herb be taken for 6 months, followed by evaluation by a primary health care provider (Bent, 2006). (Ford 520)

Generic	Trade	Use	Dose
<b>Finasteride</b> • <b>Androgen hormone inhibitor</b>	Propecia, Proscar	Male-pattern baldness, BPH	1–5 mg/day orally
<b>Doxazosin</b> • <b>Peripheral adrenergic</b>	Cardura	Hypertension, BPH	Hypertension: 1–8 mg orally daily; BPH: 1–16 mg orally daily
<b>Tamsulosin</b> • <b>Peripheral adrenergic</b>	Flomax	BPH	0.4 mg orally daily

# TB Drugs:

## Pyrazinamide

### How do they work? "Action"

Many antitubercular drugs are bacteriostatic against the *M. tuberculosis* bacillus. These drugs usually act to inhibit bacterial cell wall synthesis, which slows the multiplication rate of the bacteria. Isoniazid is bactericidal, with rifampin and streptomycin having some bactericidal activity.

### Indications

- Treatment of TB in a protocol

### Adverse reactions

- Hepatotoxicity
- Nausea
- Vomiting
- Diarrhea
- Myalgia
- Rash

### Contraindications & Caution

- Hypersensitivity
- Gout
- Severe hepatic damage

### Nursing alert

- Pyrazinamide should be used cautiously in patients during pregnancy (category C) and lactation and in patients with hepatic and renal impairment, HIV infection, and diabetes mellitus. (Ford 106)

### Nursing management

- Ask the patient what he or she thinks causes the symptoms; promote health literacy by integrating the patient's beliefs and fears into how the bacteria invades the body and how the drugs work to kill it.
- Discuss tuberculosis, its causes and communicability, and the need for long-term therapy for disease control using simple, non medical terms.
- Review the drug therapy regimen, including the prescribed drugs, doses, and frequency of administration.
- Reassure the patient that various combinations of drugs are effective in treating tuberculosis.
- Urge the patient to take the drugs exactly as prescribed and not to omit, increase, or decrease the dosage unless directed to do so by the health care provider.
- Instruct the patient about possible adverse reactions and the need to notify the prescriber should any occur.
- Arrange for direct observation therapy with the patient and family.
- Instruct the patient in measures to minimize gastrointestinal upset.
- Advise the patient to avoid alcohol and the use of nonprescription drugs, especially those containing aspirin, unless use is approved by the health care provider.
- Reassure the patient and family that the results of therapy will be monitored by periodic laboratory and diagnostic tests and follow-up visits with the health care provider

### Interactions

- When pyrazinamide is administered with the anti gout medications allopurinol (Zyloprim), colchicine, or probenecid, its effectiveness decreases.

#### Generic

Pyrazinamide  
Primary treatment

#### Trade

n/a

#### Use

Active TB

#### Dose

15–30 mg/kg/day orally,  
maximum 3 g/day orally; 50–70  
mg/kg twice weekly orally

# Drug Activity in the body

## Pharmaceutic Phase

During this phase the drug is dissolved in the body. Liquid medications and IV medications are already dissolved therefore they absorb much faster in the body. A tablet or capsule must pass through the GI tract to become dissolved. Enteric coated medications are time released capsules or tablets that must meet the alkaline environment of the small intestine before it dissolves.

## Pharmacokinetic Phase

This phase refers to how the drug is transported and distributed. The drug can be distributed or transported via absorption, distribution, metabolism, and excretion.

- **Absorption:** moves the drug from the point of administration to the body fluids via active transport, passive transport, pinocytosis.
- **Distribution:** The systemic circulation distributes drugs to various body tissues. Distribution depends on protein binding, blood flow, and solubility. The drug comes into contact with albumin or remain free, only free circulating particles can produce a therapeutic effect.
- **Metabolism:** Or biotransformation, the body changes the drug to be more or less active and excretable. Most are metabolized by the liver or kidneys, lungs, plasma, and intestinal mucosa.
- **Excretion:** Elimination of the drug from the body after the liver renders it inactive it is then excreted by the kidneys via urine.

## Pharmacodynamic Phase

Deals with the drug's action and effect on the body.

- **Primary effect:** The desired therapeutic effect.
- **Secondary effect:** Any other effect the drug has on the body. For example, sildenafil was made for treatment of hypertension. It was also found to help with Erectile dysfunction which is its secondary effect. A drug exerts its action by two main mechanisms.
- **Alteration in cellular function**
- **Alteration in cellular environment**

## Phases Of Activity

- Pharmaceutic phase
- Pharmacokinetic phase
- Pharmacodynamic phase.

## Influences On Absorption

- Route: IV/IM are the fastest to be absorbed.
- Solubility
- Condition of body tissues

## Influence On Metabolism

- Age
- Weight
- Sex
- Disease
- Route

## Interactions

- **Additive drug interaction:** The combined effect of two drugs has an equal effect if the drug was given alone.
- **Synergistic interaction:** When drugs interact and create an increased effect example: Hypnotics and alcohol when taken together will cause increased CNS depression.
- **Antagonistic interaction:** One drug interferes with the action of another for example: Naloxone reverses the effects of opioids.
- **Food interaction:** Some food can decrease or increase the metabolism of a drug.

## Effects On The Nervous System

- **Sympathomimetic:** physiological effects characteristic of the sympathetic nervous system by promoting the stimulation of sympathetic nerves.
- **Sympatholytic:** antagonistic to or inhibiting the transmission of nerve impulses in the sympathetic nervous system.
- **Parasympathomimetic:** stimulates the parasympathetic nervous system (PSNS). These chemicals are also called cholinergic drugs because acetylcholine (ACh) is the neurotransmitter used by the PSNS.
- **Parasympatholytic:** reduces the activity of the parasympathetic nervous system.

## Key Terms

- **First pass effect:** The concentration of a drug is greatly reduced before it reaches the systemic circulation
- **Half life:** Time it takes for the body to eliminate 50% of the drug.
- **Onset of action:** Time it takes for the drug to reach therapeutic effect after administration.
- **Peak concentration:** When the absorption rate equals the elimination rate.
- **Duration:** How long the drug produces a therapeutic effect.
- **Pharmacogenomics:** People's response to medication is variable. Genetic makeup can alter how a drug works.
- **Teratogen:** Any substance that causes abnormal development of a fetus.
- **Idiosyncrasy:** unusual or abnormal reaction to a drug.
- **Drug tolerance:** Decreased response to a drug that requires an increase in dosage.
- **Cumulative drug effect:** Seen in people with liver or kidney disease, the body is unable to excrete one dose of the drug before the next dose is given causing an accumulation of the drug in the system.

## Reactions

- **Adverse drug reactions:** Undesirable drug effects. They may be mild, severe or life threatening. May occur at the first dose or after subsequent doses.
- **Allergic drug reactions:** Immediate hypersensitivity reaction. Occurs because the individual's immune system responds to the drug as a foreign substance. Some reactions occur immediately or they can take time. They can be mild, severe or life threatening.
- **Anaphylactic shock:** Extremely serious reaction that usually occurs immediately after drug administration. This requires immediate medical intervention to raise the BP and improve breathing. Can be fatal if not treated immediately.
- **Angioedema:** Allergic reaction manifested by collection of fluid in the subcutaneous tissue. Most commonly affects the eyes, lips, mouth and throat.
- **Toxic reaction:** Toxic levels build up in the body when the body cannot excrete the drug.

# Pharm Quick Glance

## Medication Classifications

- **Antacids** - reduces hydrochloric acid in the stomach.
- **Antianemics** - increases blood cell production.
- **Anticholinergics** - decreases oral secretions.
- **Anticoagulants** - prevents clot formation,
- **Anticonvulsants** - used for management of seizures and/or bipolar disorders.
- **Antidiarrheals** - decreases gastric motility and reduce water in bowel.
- **Antihistamines** - block the release of histamine.
- **Antihypertensives** - lower blood pressure and increases blood flow.
- **Anti-infectives** - used for the treatment of infections
- **Bronchodilators** - dilates large air passages in asthma or lung diseases (e.g., COPD).
- **Diuretics** - decreases water/sodium from the Loop of Henle.
- **Laxatives** - promotes the passage of stool.
- **Miotics** - constricts the pupils.
- **Mydriatics** - dilates the pupils.
- **Narcotics/analgesics** - relieves moderate to severe pain.

## Drug Schedules

### Drug Schedules

- **Schedule I** - no currently accepted medical use and for research use only (e.g., heroin, LSD, MDMA).
- **Schedule II** - drugs with high potential for abuse and requires written prescription (e.g., Ritalin, hydromorphone (Dilaudid), meperidine (Demerol), and fentanyl).
- **Schedule III** - requires new prescription after six months or five refills (e.g., codeine, testosterone, ketamine).
- **Schedule IV** - requires new prescription after six months (e.g., Darvon, Xanax, Soma, and Valium).
- **Schedule V** - dispensed as any other prescription or without prescription (e.g., cough preparations, Lomotil, Motofen)

## Pregnancy Categories

- Category A—No risk in controlled human studies
- Category B—No risk in other studies.  
Examples: Amoxicillin, Cefotaxime.
- Category C—Risk not ruled out.  
Examples: Rifampicin (Rifampin), Theophylline (Theolair).
- Category D—Positive evidence of risk.  
Examples: Phenytoin, Tetracycline.
- Category X—Contraindicated in Pregnancy.  
Examples: Isotretinoin (Accutane), Thalidomide (Immunoprin), etc.
- Pregnancy Category N—Not yet classified

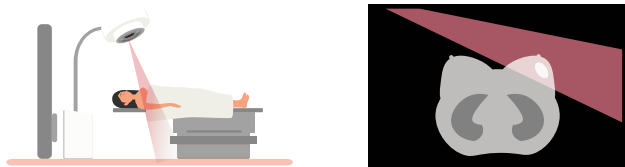
## Nursing Considerations

- **Digoxin (Lanoxin)** - Assess pulses for a full minute, if less than 60 bpm hold dose. Check digitalis and potassium levels.
- **Aluminum Hydroxide (Amphojel)** - Treatment of GERD and kidney stones. Monitor constipation.
- **Hydroxyzine (Vistaril)** - Treatment of anxiety and itching. WOF dry mouth.
- **Midazolam (Versed)** - given for conscious sedation. Watch out for respiratory depression and hypotension.
- **Amiodarone (Cordarone)** - diaphoresis, dyspnea, lethargy. Take missed dose any time in the day or to skip it entirely. Do not take double dose.
- **Warfarin (Coumadin)** - Watch for signs of bleeding, diarrhea, fever, or rash. Stress importance of complying with prescribed dosage and follow-up appointments.
- **Methylphenidate (Ritalin)** - Treatment of ADHD. Assess for heart related side-effects and reported immediately. Child may need a drug holiday because the drug stunts growth.
- **Dopamine** - Treatment of hypotension, shock, and low cardiac output. Monitor ECG for arrhythmias and blood pressure.
- **Rifampicin** - causes red-orange tears and urine.
- **Ethambutol** - causes problems with vision, liver problem.
- **Isoniazid** - can cause peripheral neuritis, take vitamin B6 to counter.

# Cancer Treatment Radiation & Brachytherapy

## Name:

Radiation (outside of the body)



## Indication:

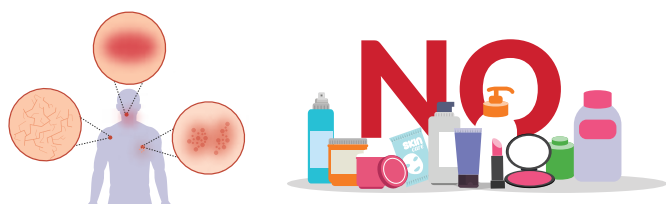
Typical radiation outside of the body is used in combo with chemotherapy to help shrink cancerous tumors before surgery



## Side Effects:

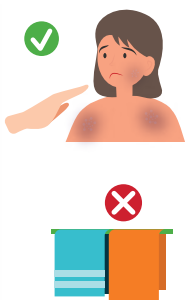
Very hard on the skin: red, dry & itchy

- **NO** hard scrubbing of skin
- **NO** tape or deodorants
- **NO** shaving
- **NO** lotions, creams, perfumes, powders, makeup cosmetics



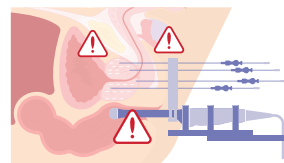
## ATI

Client with cancer undergoing **radiation therapy**  
I will **use my hands** rather than a washcloth to clean the **radiation area**



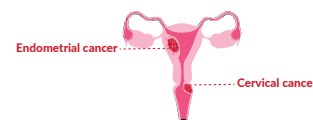
## Name:

Brachytherapy (radiation inside the body)



## Indication:

- Endometrial cancer
- Cervical cancer



NCLEX #1 goal is safety  
A radioactive implant is placed directly inside the tumor for **24-72 hours - making this patient like a radioactive hazard!**



## KEY POINTS

### 1. Time:

- Cluster care **30 minutes** per shift!
- Staff is to wear radiation **film badge** (dosimeter)

### 2. Distance:

- **TEACH all visitors** distance of at **least 6 feet**
- NO Pregnant Company
- NO one less than 18 years old
- **Private** room + toilet
- **Close door** to room at all times
- Sign on door "caution radioactive"

### 3. Shielding:

Use **Lead Apron** when in **DIRECT CONTACT** with patient



## Notes

# TB Drugs:

## Rifampin

### How do they work? "Action"

Many antitubercular drugs are bacteriostatic against the *M. tuberculosis bacillus*. These drugs usually act to inhibit bacterial cell wall synthesis, which slows the multiplication rate of the bacteria. Isoniazid is bactericidal, with rifampin and streptomycin having some bactericidal activity.

### Indications

- Treatment of TB in a protocol

### Adverse reactions

- Nausea and vomiting
- Epigastric distress, heartburn, fatigue
- Vertigo (dizziness)
- Rash
- Reddish-orange discoloration of body fluids (urine, tears, saliva, sweat, and sputum)
- Hematologic changes, renal insufficiency (Ford 106)

### Contraindications & Caution

Rifampin is contraindicated in patients with a history of hypersensitivity to the drug. The drug is used with caution during pregnancy (category C) and lactation and in patients with hepatic or renal impairment. (Ford 106)

### Nursing alert

- Leprosy, also referred to as Hansen's disease, is caused by the bacterium *Mycobacterium leprae*. Leprosy is a chronic, communicable disease that is not easily spread and has a long incubation period. Since 1985, the prevalence of leprosy has dropped by 90%. About 100 new cases are diagnosed yearly in the United States (primarily the southern states, Hawaii, and U.S. possessions).
- Peripheral nerves are affected, causing sensory loss and muscle weakness. The traditional fear of leprosy relates to skin involvement, which may present with lesions confined to a few isolated areas or may be fairly widespread over the entire body. Dapsone, clofazimine (Lamprene), rifampin (Rifadin), and ethionamide (Trecator) are drugs currently used to treat leprosy (Ford 106)

### Nursing management

- Ask the patient what he or she thinks causes the symptoms; promote health literacy by integrating the patient's beliefs and fears into how the bacteria invades the body and how the drugs work to kill it.
- Discuss tuberculosis, its causes and communicability, and the need for long-term therapy for disease control using simple, non medical terms.
- Review the drug therapy regimen, including the prescribed drugs, doses, and frequency of administration.
- Reassure the patient that various combinations of drugs are effective in treating tuberculosis.
- Urge the patient to take the drugs exactly as prescribed and not to omit, increase, or decrease the dosage unless directed to do so by the health care provider.
- Instruct the patient about possible adverse reactions and the need to notify the prescriber should any occur.
- Arrange for direct observation therapy with the patient and family.
- Instruct the patient in measures to minimize gastrointestinal upset.
- Advise the patient to avoid alcohol and the use of nonprescription drugs, especially those containing aspirin, unless use is approved by the health care provider.
- Reassure the patient and family that the results of therapy will be monitored by periodic laboratory and diagnostic tests and follow-up visits with the health care provider.

### Interactions

- **Antiretrovirals (efavirenz, nevirapine):** Decreased serum levels of antiretrovirals
- **Digoxin:** Decreased serum levels digoxin
- **Oral contraceptives:** Decreased contraceptive effectiveness
- **Isoniazid:** Higher risk of hepatotoxicity
- **Oral anticoagulants:** Increased risk for bleeding
- **Oral hypoglycemics:** Decreased effectiveness of oral hypoglycemic agent
- **Chloramphenicol:** Increased risk for seizures
- **Phenytoin:** Decreased effectiveness of phenytoin
- **Verapamil:** Decreased effects of verapamil

### Generic

Rifampin

### Trade

Rifadin, Rimactane

### Use

Active TB, Hansen's disease (Ford 109)

### Dose

10 mg/kg (up to 600 mg/day) orally, IV (Ford 109)

# Skin Isotretinoin

## Vitamin A derivative

### Drug name:

Vitamin A  
derivative



### Indication:

Severe acne



### Major Adverse Effect:

Birth defects

Suicide risk



### Patient teaching:

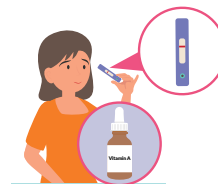
#### KEY POINTS

- **Avoid** vitamin A supplements
- Report **Suicidal** thoughts **NCLEX TIP**
- No Pregnancy - **2 forms of contraception** **NCLEX TIP**
- **Also mentioned by ATI as PRIORITY** above all else!
- NO pregnancy is NO JOKE
- There were 5 criteria for PREVENTING pregnancy

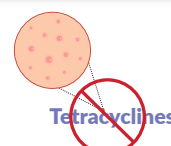
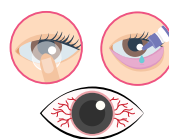


### HESI Question

- Register with iPledge program
- One **negative pregnancy** test before refills
- Patient must agree to report depressed mood/**suicidal thoughts**



- **Skin changes**
  - **Avoid** excessive sun
- **Dry Eyes**
  - **May not be able to wear contacts**
  - Will need lubricating eye drops
- Risk For - Increased ICP - **Avoid tetracyclines**



Tetracyclines

### Notes

# Antidepressants

## SNRI vs. TCA

### Drug name:

**DULOXETINE**



### Indication:

1. Depression
2. Pain: Neuro pathic pain  
= Diabetics & Fibromyalgia



### Memory Trick:

**DUAL-OXETINE**  
- **DOUBLE PURPOSE**  
- **DEPRESSION & PAIN**

### Patient Education:

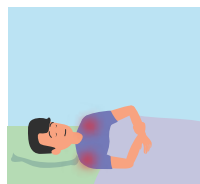
"If a fibromyalgia patient is prescribed this & they're not depressed they need education on the purpose that it is to help with their pain"



### KEY POINT

#### Patient Teaching

Helps with **chronic pain** & **improves sleep** in patients with fibromyalgia



### Drug name:

**AMITRIPTYLINE**

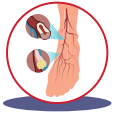
**SLOW** position changes

**IMIPRAMINE**



### Indication:

1. Depression, Anxiety
2. Neuro pathic pain =  
Diabetics & Fibromyalgia



### Side Effects:

Dry body (can't see, pee, spit or shh - poop)



**NCLEX TIP**

### KEY POINT

- **Orthostatic Hypotension**  
- Slow position changes esp  
**MEMORY TRICK**  
**Amitriptyline** - Amy trips on things !! - **SLOW** position changes

- **Urinary Retention**  
**MEMORY TRICK**  
**Imipramine** - Inhibit my PEEING

- **NEVER** take with MAOI  
2 week wash-out period  
**NO** MAOI + Antidepressants  
(TCA, SSRI, SNRI)



## Notes

# Somatotropins

## How do they work? "Action"

Somatropin is identical to human GH and produces skeletal growth in children. This drug is administered to children who have not grown because of a deficiency of pituitary GH; it must be used before closure of the child's bone epiphyses. (Ford 470)

## Indications

- Growth failure in children due to Prader-Willi syndrome. Growth failure in children due to deficiency of growth hormone. Growth failure in children born small for gestational age (SGA) who fail to manifest catch-up growth by age 2

## Adverse Reactions

- Edema of the hands and feet
- Hyperglycemia
- hypothyroidism, insulin resistance
- PANCREATITIS.
- pain at injection site, local lipoatrophy or lipodystrophy with subcutaneous use
- arthralgia.

## Interactions:

- Excessive corticosteroid use (equivalent to 10– 15 mg/m<sup>2</sup> /day) may decrease response to growth hormone.

## Contraindications

- Closure of epiphyses
- Active neoplasia
- Hypersensitivity to growth hormone or m-cresol preservative
- Acute critical illness (therapy should not be initiated)
- Respiratory failure
- Diabetic retinopathy
- Prader-Willi syndrome with obesity and respiratory impairment (risk of fatal complications; can be used only if growth hormone deficiency is documented).

## Nursing management

- Monitor bone age annually and growth rate determinations, height, and weight every 3– 6 mo during therapy.
- Monitor bone age annually and growth rate determinations, height, and weight every 3– 6 mo during therapy.
- Assure parents and child that these dose forms are synthetic and therefore not capable of transmitting Creutzfeldt-Jakob disease, as was the original somatropin, which was extracted from human cadavers.
- Advise parents to monitor blood glucose closely in children with diabetes mellitus. Parents should also be advised to report persistent severe abdominal pain; may be a symptom of pancreatitis.
- Emphasize need for regular follow-up with endocrinologist to ensure appropriate growth rate, to evaluate lab work, and to determine bone age by

Generic	Trade	Use	Dose
<b>Somatropin</b> • Growth hormone	Genotropin, Humatrope, Norditropin, Nutropin, Serostim	Growth failure due to deficiency of pituitary GH in children, replacement of endogenous GH in adults	Doses are individualized, administered by subcut injection weekly
<b>Octreotide</b> • Growth hormone inhibitor	Sandostatin	Reduction of GH in acromegaly and treatment of certain tumors	50 mcg subcut or IV BID or TID

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# Antidepressants

## - SSRI

### Drug names:

- **SERTRALINE**
- **CITALOPRAM**
- **ESCITALOPRAM**
- **PAROXETINE**
- **FLUOXETINE**



### Indication:

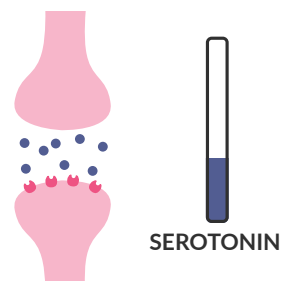
Depression, Anxiety, PTSD



### MOA:

Inhibits the REuptake of Serotonin keeping MORE around. So Serotonin levels are INCREASED

**SELECTIVE  
SEROTONIN  
REUPTAKE  
INHIBITORS**



### Side Effects:

1. Sexual dysfunction
2. Weight Gain
3. Insomnia, **NOT** sleepiness or sedation, don't get tricked

## Serotonin Syndrome

**S**

**SUICIDE Risk  
INCREASED**



**S**

**SLOW Onset &  
Slow Taper off!**



**S**

**SWEATY & HOT  
+ FEVER**



**R**

**RIGID muscles  
+ Restlessness  
& Agitation**



**I**

**INCREASED  
Heart Rate  
"Tachycardia"**

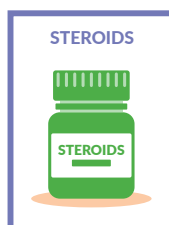


### Notes

# Steroids

Drug name:

S



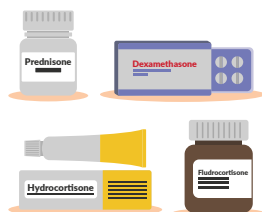
S



**S - STEROIDS**  
**S - Stress & Swelling hormone**

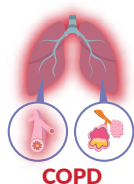
**"-Sone"**

- Predni**sone**
- Dexametha**sone**
- Hydrocorti**sone**
- Fludrocorti**sone**



Indication:

Given to help the body respond to inflammation & STRESS!  
Commonly for:



- Inflamed Lung like **COPD**
- Inflamed joints like **Rheumatoid Arthritis**
- Inflamed SKIN like **Psoriasis**
- Inflamed body - like **Lupus** where the body attacks itself
- **Allergic** reaction where EVERYTHING swells UP



**ADDISON vs. CUSHING TREATMENTS:**

## 7 S's STEROID PRECAUTIONS

**"-sone"** predni**sone**, hydrocorti**sone**, dexametha**sone**

**S SWOLLEN** (Water gain = Weight gain)

**KEY TERMS:** "Sudden" "excessive", "rapid"

**REPORT:** 1 Lb. in 1 day, or 2-3lbs in a few

**S SEPSIS** (Infections or Illness)

"Low WBC" Fever is **PRIORITY** **NCLEX TIP**

**S SUGAR INCREASED**

"Hyperglycemia" **NCLEX TIP**

**S SKINNY**

Muscle & Bones "Osteoporosis" (R/F Fx)

**S SIGHT**

(Cataracts risk) refer to Optometrist

## PREVENT CRISIS:

**S SLOWLY** taper off

(**NEVER** abruptly stop) **NCLEX TIP**

**S STRESS** or Surgery

(increase dose)

## TOP 3 MISSED Questions:

The nurse should be concerned when the client states: "I have a **sore on my leg that won't go away**". Which medication should be reviewed with HCP. **Select all that apply**

- ☐ 1. Naproxen
- ☐ 2. Dihydromorphanone
- ☒ 3. **Dexamethasone**
- ☐ 4. Hydrocodone
- ☒ 5. **Hydrocortisone**

Which priority teaching is required for a patient prescribed **prednisone** for Lupus?

- ☐ 1. Report slight increases in blood sugar to HCP immediately.
- ☒ 2. **Increase dose before surgery or during times of stress.**
- ☐ 3. Monitor weight weekly.
- ☐ 4. Take with full meal at breakfast.

Which of the follow is an indication that the client needs additional teaching, while taking fludrocortisone?

- ☐ 1. I will not discontinue this medication abruptly
- ☒ 2. **New bilateral pedal edema is normal**
- ☐ 3. The most important value to monitor is my weight.
- ☐ 4. I will report signs & symptoms of infection

## Notes

# Anticonvulsants

## - Succinimides

### How do they work? "Action"

**Succinimides** depress the motor cortex, creating a higher threshold before nerves react to the convulsive stimuli.

### Indications

- Seizures of all types
- Neuropathic pain
- Bipolar disorders
- Anxiety disorders

### Adverse Reactions

- Nystagmus (constant, involuntary movement of the eyeball)
- Ataxia (loss of control of voluntary movements, especially gait)
- Slurred speech
- Gingival hyperplasia (overgrowth of gum tissue)

### Contraindications

Succinimides are contraindicated in patients with bone marrow depression or hepatic or renal impairment. A higher incidence of systemic lupus erythematosus has been found in patients taking succinimides.

### Interactions

- **Antibiotics/antifungals:** Increased effect of the anticonvulsant
- **Tricyclic antidepressants:** Increased effect of the anticonvulsant
- **Salicylates:** Increased effect of the anticonvulsant
- **Cimetidine:** Increased effect of the anticonvulsant
- **Theophylline:** Decreased serum levels of the anticonvulsant
- **Antiseizure medications:** May increase seizure activity
- **Protease inhibitors:** Increased carbamazepine levels, resulting in toxicity
- **Oral contraceptives:** Decreased effectiveness of birth control, resulting in breakthrough bleeding or pregnancy
- **Analgesics or alcohol:** Increased depressant effect
- Antidiabetic medications: Increased blood glucose levels

### Fun Fact

- Research suggests an association between the use of anticonvulsants by pregnant women with epilepsy and an increased incidence of birth defects. The use of anticonvulsants is not discontinued in pregnant women with a history of major seizures because of the danger of precipitating status epilepticus. However, when seizure activity poses no serious threat to the pregnant woman, the primary health care provider may consider discontinuing use of the drug during pregnancy.
- Recurrence of seizure activity may result from abrupt discontinuation of the drug, even when the anticonvulsant is being administered in small daily doses
- Hematologic changes (e.g., aplastic anemia, leukopenia, and thrombocytopenia) need to be reported immediately. Teach the patient how to identify signs of thrombocytopenia (bleeding gums, easy bruising, increased menstrual bleeding, tarry stools) or leukopenia (sore throat, chills, swollen glands, excessive fatigue, or shortness of breath) and to contact the primary health care provider..

### Nursing management

- If GI upset occurs, take the drug with food or milk.
- Notify the primary health care provider if any of the following occurs: skin rash, joint pain, unexplained fever, sore throat, unusual bleeding or bruising, drowsiness, dizziness, blurred vision, or pregnancy.

Generic	Trade	Use	Dose
<b>Ethosuximide</b>	Zarontin	Partial seizures	Up to 1.5 g/day orally in divided doses; children, 250 mg/day orally
<b>Methsuximide</b>	Celontin	Partial seizures	300–1200 mg/day orally

# Sulfonamides & Fluoroquinolones

## Sulfonamides

Trimethoprim  
**sulfamethoxazole**  
(Brand: Bactrim)



### MOA:

Stops bacteria folic acid synthesis



### KEY POINT

**Rash while on Glyburide?**  
Potential allergy to sulfa drugs!!!!



**NOT Pregnancy Safe**



### Memory Trick:

**S**

**U**

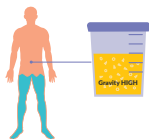
**L**

**F**

**SUNBURN**  
(sunblock & avoid sun)



**URINE**  
Crystals & Specific Gravity  
**HIGH = DRY!**



**LOVE**  
water!! 2-3L per day



**FOLIC ACID**  
(take daily)



### Key NCLEX Tips:

Contraindications:  
Hypersensitivity to sulfa drugs  
Assess for allergies to sulfonylureas like Glyburide - An oral diabetic drug

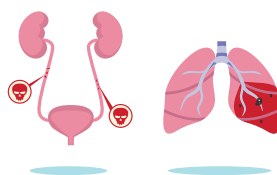


## Fluoroquinolones

- Levo**floxacin**  
(Brand: Levaquin)
- Cipro**floxacin**

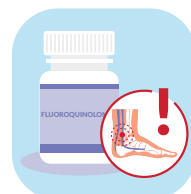
### Indication:

Given for Pneumonia & UTIs



### KEY POINTS:

- Avoid Sun "direct sun exposure"
- Achilles** tendon **RUPTURE!!** **TEST TIP**
- REPORT NEW MUSCLE PAIN!
- Contraindication: Tendonitis



### Key NCLEX Tips:

Many students want to avoid **FLOXACIN** when creatinine & BUN is elevated.

Floxacin sounds very similar to **MYCIN** (antibiotics that kill the kidneys)  
Look at the entire suffix so you don't end tricked.

**DON'T GET TRICKED**



### Memory Trick:



## Notes

# Anti Infectives

## - Sulfonamides

### How do they work? "Action"

Bacteriostatic agents that are used to halt the growth of bacteria. Their ability to inhibit the activity of folic acid in bacterial cell metabolism. They are often used to control infections caused by both gram-positive and gram-negative bacteria, such as *Escherichia coli*, *Staphylococcus aureus*, and *Klebsiella* and *Enterobacter* species. (Ford 62)

### Indications

- Urinary tract infections (UTIs) and acute otitis media
- Ulcerative colitis
- Mafenide (Sulfamylon) and silver sulfadiazine (Silvadene) are topical sulfonamides used in the treatment and prevention of infections in second- and third-degree burns.

### Adverse Reactions

- Nausea, vomiting, anorexia
- Diarrhea, abdominal pain
- Stomatitis (inflammation of the mouth)
- Chills, fever
- Crystalluria (crystals in the urine)
- Photosensitivity
- Steven Johnson syndrome
- TEN
- **Leukopenia** - decrease in the number of white blood cells
- **Thrombocytopenia** - decrease in the number of platelets
- **Aplastic anemia** - deficient red blood cell production in the bone marrow

### Contraindications & Caution

- Hypersensitivity to sulfonamides
- During lactation
- In children younger than 2

### Nursing Alert

- If sulfonamides are given near the end of pregnancy, significantly high blood levels of the drug may occur, causing jaundice or hemolytic anemia in the neonate. In addition, the sulfonamides are not used for infections caused by group A beta ( $\beta$ )-hemolytic streptococci because the sulfonamides have not been shown to be effective in preventing the complications of rheumatic fever or glomerulonephritis. (Ford 63)
- When diabetic patients are prescribed sulfonamides, assess for a possible hypoglycemic reaction. Sulfonamides may inhibit the (hepatic) metabolism of the oral hypoglycemic drugs tolbutamide and chlorpropamide (Diabinese). (Ford 63)

### Nursing management

- Before administering any antibiotic be sure to evaluate the results of the culture and sensitivity test.
- Take the drug at the prescribed time intervals. These time intervals are important because a certain amount of the drug must be in the body at all times for the infection to be controlled..
- Do not increase or omit the dose unless advised to do so by the primary health care provider.
- Complete the entire course of treatment. Do not stop the drug, except on the advice of a primary health care provider, before the course of treatment is completed, even if symptoms improve or disappear. Failure to complete the prescribed course of treatment may result in a return of the infection.
- Take drugs that must be taken on an empty stomach 1 hour before or 2 hours after a meal.
- Distinguish between immediate- and extended-release medications. Do not break, chew, or crush extended-release medications.
- Notify the primary health care provider if symptoms of the infection become worse or if original symptoms do not improve after 5 to 7 days of drug therapy.
- Avoid any exposure to sunlight or ultraviolet light (tanning beds, sunlamps) while taking these drugs and for several weeks after completing the course of therapy. Wear sunblock, sunglasses, and protective clothing when exposed to sunlight.
- Specific Instructions Regarding Sulfonamides
- Take sulfasalazine (Azulfidine) with food or immediately after a meal.
- When taking sulfasalazine, the skin or urine may turn orange-yellow; this is normal. Soft contact lenses may acquire a permanent yellow stain. It is a good idea to seek the advice of an ophthalmologist

### Interactions:

- **Oral anticoagulants:** Increased action of the anticoagulant
- **Methotrexate:** Increased bone marrow suppression
- **Hydantoins:** Increased serum hydantoin level

### Herbal Considerations

Cranberries and cranberry juice are commonly used folk remedies for preventing and relieving symptoms of UTIs. The use of cranberries in combination with antibiotics has been recommended by physicians for the long-term suppression of UTIs. Cranberries are thought to prevent bacteria from attaching to the walls of the urinary tract. The suggested dose is 6 ounces of juice twice daily. Cranberry capsules are not recommended because the fluid for hydration may be as helpful as the berries (Brown, 2012). Extremely large doses can produce GI disturbances, such as diarrhea or abdominal cramping. Although cranberries may relieve symptoms or prevent the occurrence of a UTI, their use will not cure a UTI. If an individual suspects a UTI, medical attention is necessary. (Ford 63)

Generic	Trade	Use	Dose
Sulfadiazine	Pfizerpen	UTIs, chancroid, acute otitis media, <i>Haemophilus influenzae</i> and meningococcal meningitis, rheumatic fever	Loading dose: 2–4 g orally; maintenance dose: 2–4 g/day orally in 4–6 divided doses
Sulfasalazine	Azulfidine, Azulfidine EN-tabs	UTI, acute otitis media, <i>Haemophilus influenzae</i> , meningococcal meningitis	Initial therapy: 1–4 g/day orally in divided doses; maintenance dose: 2 g/day orally in evenly spaced doses (500 mg QID)

# Diabetes Drugs

## - Sulfonylureas

### How do they work? "Action"

Sulfonylureas act to lower blood glucose by stimulating the  $\beta$  cells of the pancreas to release insulin. Sulfonylureas are not effective if the  $\beta$  cells of the pancreas cannot release a sufficient amount of insulin to meet the individual's needs. (Ford 452)

### Indications

Oral antidiabetic drugs are used in the treatment of patients with type 2 diabetes mellitus whose condition cannot be controlled by diet alone. (Ford 452)

### Adverse Reactions

- Hypoglycemia
- Anorexia
- nausea, vomiting
- epigastric discomfort, weight gain
- heartburn, and various vague neurological symptoms, such as weakness and numbness of the extremities.

### Contraindications & Caution

- Known hypersensitivity
- DKA
- Severe infection
- The first-generation sulfonylureas (chlorpropamide, tolazamide, and tolbutamide) are contraindicated in patients with coronary artery disease or liver or renal dysfunction. (Ford 453)

### Hypoglycemia

**Methods of terminating a hypoglycemic reaction include the administration of one or more of the following:**

- 4 ounces of orange juice or other fruit juice
- Hard candy or 1 tablespoon of honey
- Commercial glucose products such as glucose gel or glucose tablets
- Glucagon by the subcut, IM, or IV routes
- Glucose 10% or 50% IV (Ford 458)

### Interactions:

#### Increased hypoglycemic effects:

- Anticoagulants
- Chloramphenicol
- Clofibrate
- Fluconazole
- histamine H2 antagonists
- Methyldopa
- monoamine oxidase inhibitors (MAOIs)
- nonsteroidal anti-inflammatory drugs (NSAIDs),
- salicylates, sulfonamides, and tricyclic antidepressants.

#### Decreased Hypoglycemic effect

- $\beta$  blockers, calcium channel blockers
- cholestyramine, corticosteroids
- estrogens, hydantoins, isoniazid
- oral contraceptives, phenothiazines, rifampin
- thiazide diuretics, and thyroid agents.

### Nursing management

- Monitor blood glucose closely when starting or stopping therapy.
- Monitor HbA1c number is to be lower than 6%
- Chlorpropamide, tolazamide, and tolbutamide are given with food to prevent GI upset. However, because food delays absorption, glipizide should be given 30 minutes before a meal. Glyburide and glimepiride are administered with breakfast or with the first main meal of the day. Repaglinide can be taken immediately or up to 30 minutes before meals. Nateglinide is taken up to 30 minutes before meals.
- Take the drug exactly as directed on the container (e.g., with food, 30 minutes before a meal).
- An antidiabetic drug is not oral insulin and cannot be substituted for insulin.
- Never stop taking this drug or increase or decrease the dose unless told to do so by the primary health care provider.
- Take the drug at the same time or times each day. (Ford 460)

Generic	Trade	Safe Dose	Route
Chlorpropamide First Generation	Diabense	Type 2 Diabetes as an adjunct to diet and exercise. Diabetes insipidus	100-250 mg orally/ day
Glimepiride 2nd Generation	Amaryl	Type 2 Diabetes as an adjunct to diet and exercise. May be used with insulin	1-4 mg orally/day
Nateglinide Meglitinide	Starlix	Type 2 diabetes in combination with metformin for glycemic control	60-120 mg orally TID before meals

# TB Drugs

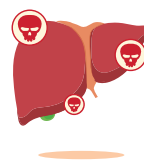
## 5 TB Tips

### 5 NCLEX TIPS

1. Meds Last **6 - 12 months**
2. N-95 mask worn all the time
3. Family tested for TB
4. Sputum samples every 2 - 4 Weeks
5. **3 Negative** cultures on **3 different days** = NO Longer infectious



## Memory Trick



ALL are **LIVER TOXIC!!!!**

So some instructors just use the acronym:

**R I P E**

**R**

**RIFAMPIN**  
**RED-FAMPIN**

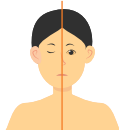
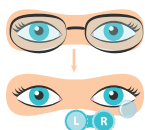


### KEY Points:

1. **NORMAL**
  - Red, Orange: Tears, Urine, Sweat

**Teach:**

  - Wear glasses instead of contacts due to discoloration of tears **NCLEX TIP**
2. Oral contraceptives ineffective  
"Use **non-hormonal**  
**Back-up birth control**"
3. Monitor for Jaundice



**I**

**INH**  
**ISONIAZID**

**#1 TESTED TB DRUG**

- I** - Interferes with absorption of B6 (pyridoxine)
- Low **Vitamin B6** = Peripheral **Neuropathy**
  - Take **Vitamin B6** 25 - 50mg/day
- N** - Neuropathy
- REPORT:**
- New Numbness
  - Tingling extremities
  - Ataxia
- H** - Hepatotoxicity
- REPORT Immediately!!!**
- Jaundice (yellow) **Skin / Sclera**
  - Dark urine **NCLEX TIP**
  - Fatigue
  - Elevated liver enzymes (AST/ALT)
- HOLD the Med**
- Teach: NO ETOH!!

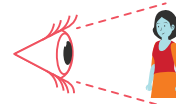
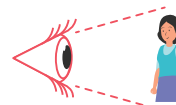


**E**

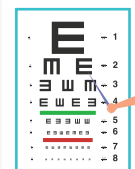
**ETHAMBUTOL - Eye**

**KEY POINT:**  
**REPORT!**

- Blurred vision
- Color changes



This information has come up in multiple sections!  
**TEACH** to have baseline eye exams and routine **EYE** appointments! For **EEEEthambutol**



**P**

**PYRAZINAMIDE**

Did not come up 1 x in 10,000 questions.  
it's a nice to know but NOT A NEED TO KNOW

# Anti Infectives

## - Tetracycline

### How do they work? "Action"

Tetracyclines interfere with protein synthesis and are composed of natural and semisynthetic compounds. They are used in lieu of penicillin when there is an allergy present to penicillin or cephalosporins

### Indications

- Rickettsial diseases (Rocky Mountain spotted fever, typhus fever, and tick fevers)
- Intestinal amebiasis
- Some skin and soft tissue infections
- Uncomplicated urethral, endocervical, or rectal infections caused by *Chlamydia trachomatis*
- Severe acne as an adjunctive treatment
- Infection with *Helicobacter pylori* in combination with metronidazole and bismuth subsalicylate

### Adverse Reactions

- Nausea or vomiting
- Diarrhea
- Epigastric distress
- Stomatitis
- Sore throat
- Skin rashes
- Photosensitivity reaction (demeclocycline seems to cause the most serious photosensitivity reaction, whereas minocycline is least likely to cause this type of reaction)

### Contraindications & Caution

- Hypersensitivity to sulfonamides
- During lactation & pregnancy
- In children younger than 9 because it can discolor the teeth

### Nursing Alert

- Women of childbearing age should be assessed for oral contraception use whenever tetracyclines are prescribed.
- Do not give tetracyclines along with dairy products (milk or cheese), antacids, laxatives, or products containing iron.
- When the aforementioned drugs are prescribed, make sure they are given 2 hours before or after the administration of a tetracycline. Food or drugs containing calcium, magnesium, aluminum, or iron prevent the absorption of the tetracyclines if ingested concurrently. (Ford 89)

### Nursing management

- Before administering any antibiotic be sure to evaluate the results of the culture and sensitivity test.
- Take the drug at the prescribed time intervals. These time intervals are important because a certain amount of the drug must be in the body at all times for the infection to be controlled..
- Always report serious adverse reactions, such as a severe hypersensitivity reaction, respiratory difficulty, severe diarrhea, or a decided drop in blood pressure, to the primary health care provider immediately, because a serious adverse reaction may require emergency intervention.
- When a tetracycline has been prescribed, avoid exposure to the sun or any type of tanning lamp or bed. When exposure to direct sunlight is unavoidable, completely cover the arms and legs and wear a wide-brimmed hat to protect the face and neck. Application of a sunscreen may or may not be effective. Therefore, consult the primary health care provider before using a sunscreen to prevent a photosensitivity reaction.

### Interactions:

- **Antacids containing aluminum, zinc, magnesium, or bismuth salts:** Decreased effectiveness of tetracycline
- **Oral anticoagulants:** Increased risk for bleeding
- **Oral contraceptives:** Decreased effectiveness of contraceptive agent (breakthrough bleeding or pregnancy)
- **Digoxin:** Increased risk for digitalis toxicity

### Education

Diarrhea may be an indication of a superinfection or pseudomembranous colitis, both of which can be serious. Inspect all stools for blood or mucus. If diarrhea is dark or there is mucus in the stool, save a sample and test for occult blood using a test such as Hemoccult. If the stool tests positive for blood, save a sample of the stool for possible further laboratory analysis.

**Teach the patient to avoid the following dairy products before or after taking tetracycline:**

- Milk (whole, low fat, skim, condensed, or evaporated) and milkshakes
- Cream (half-and-half, heavy, light), sour cream, coffee creamers, and creamy salad dressings
- Eggnog
- Cheese (natural and processed) and cottage cheese
- Yogurt and frozen yogurt
- Ice cream, ice milk, and frozen custard (Ford 91)

Generic	Trade	Use	Dose
Doxycycline	Atridox, Doryx, Monodox, Periostat, Oracea, Vibra-Tabs, Vibramycin	Treatment of infections due to susceptible microorganisms	150 mg orally QID or 300 mg orally BID; gonorrhea: 600 mg orally initially then 300 mg orally q 12 hr for 4 days
Tetracycline	n/a	Treatment of infections due to susceptible microorganisms	1-2 g/day orally in 2-4 divided doses

# Tetracyclines

## Drug name:

**Tetracyclines**  
**Doxycycline**

## KEY Points:

- NOT Pregnancy Safe
- Tooth Discoloration
- Sun Burns – Wear Sun

## Memory Trick:

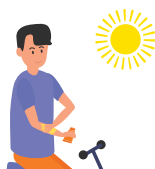
- Cycling is DANGEROUS - Not safe for a pregnant mothers!



- You can get BUGS in your teeth while cycling on a bike leading to tooth discoloration



- Use SUN BLOCK - when out for cycling around



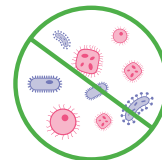
## Indication:

Mainly used for SKIN ACNE



## MOA:

It blocks protein synthesis to **STOP** bacterial growth.



## Patient Teaching:



## Key Terms:

- Use additional contraception
- Take on empty stomach
- Sit Up **30 minutes** after taking...  
**DO NOT LAY DOWN!!!**
- **AVOID** - Calcium products:
  1. **NO** Dairy (milk, cheese)
  2. **NO** Antacids (tums, Milk of Mg)
  3. **NO** Iron



## Notes

# Thrombolytics

## tPA & Alteplase

### Drug name:

tPA  
“-Ase”

- Alteplase
- Reteplase
- Streptokinase



### NCLEX Key Contraindications:

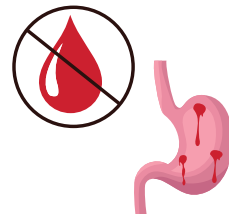
#### AVOID giving to:

1. Active bleeding
2. Uncontrolled HTN **180/110 +**
3. Recent surgery within 2 weeks

**KEY TERM:** Peptic ULCER

#### Clarify Prescription with Provider !

- A – Accidents “Recent Trauma” **NCLEX TIP**
- A – Aneurysm - Hx of hemorrhagic CVA **NCLEX TIP**
- A - AV malformation **NCLEX TIP**



### Key Point:

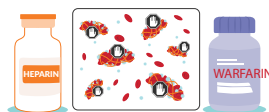
- Clot Busters - our **ATOMIC BOMB!**  
The MOST powerful 1 time push drugs!



- These are the ONLY ones that **dissolve clots!**



- Aspirin & Clopidogrel - **NOT** clot busters, they are **Anti-Platelets**



- Heparin & Warfarin - **NOT** clot busters, they prevent new clots & existing clots from getting bigger.

### KEY TERMS

**3 – 4.5 hour from ONSET** of symptoms



### KEY TERMS

THE BIG caution here is the **MASSIVE - BLEEDING RISK !!!!!**



- The big caution here is the **MASSIVE - BLEEDING RISK!** And it's the **MOST DEADLY!**



- **NO** injections at all!

- **NO NEW:**



NO IV'S



NO SUB Q



NO IMS



NO ABG

### KEY TERMS

These drugs can only be given in a compressible site like an peripheral IV.

- **Yes** “Existing” peripheral IV
- **NOT** Central Line



### Notes

# Thyroid Drugs

## How do they work? "Action"

These hormones increase the metabolic rate of tissues, which results in increases in the heart and respiratory rate, body temperature, cardiac output, oxygen consumption, and the metabolism of fats, proteins, and carbohydrates. (Ford 483)

## Indications

**Thyroid hormones are used in the treatment or prevention of hypothyroidism caused by the following:**

- Subacute or chronic thyroiditis (Hashimoto's disease or viral thyroiditis)
- Hormone supplement after hyperthyroid treatment
- Euthyroid goiter (enlargement of a normal thyroid gland)
- Thyroid nodules and multinodular goiter
- Some types of depression
- Thyroid cancer (Ford 483)

## Adverse effects of Levothyroxine

- Palpitations
- Tachycardia
- Headache
- Nervousness
- Insomnia
- Diarrhea
- Vomiting
- weight loss
- Fatigue
- Sweating
- flushing (Ford 488)

## Adverse Reactions

The most common adverse reactions are signs of overdose and hyperthyroidism as titration of the drug is being attempted. Adverse reactions other than symptoms of hyperthyroidism are rare. (Ford 483)

## Contraindications

- Hypersensitivity to the drug
- An uncorrected adrenal cortical insufficiency
- Thyrotoxicosis.
- These drugs should not be used as a treatment for obesity or infertility.
- Thyroid hormone should not be used after a recent myocardial infarction. (Ford 483)

## Nursing management

- Monitor cardiac status
- Monitor thyroid labs
- Replacement therapy is for life, with the exception of transient hypothyroidism seen in those with thyroiditis.
- Do not increase, decrease, or skip a dose unless advised to do so by the primary health care provider.
- Take this drug in the morning, preferably before breakfast, unless advised by the primary health care provider to take it at a different time of day.
- Notify the primary health care provider if any of the following occur: headache, nervousness, palpitations, diarrhea, excessive sweating, heat intolerance, chest pain, increased pulse rate, or any unusual physical change or event.
- Do not change from one brand of this drug to another without consulting the primary health care provider. (Ford 486-487)

## Interactions:

- **Digoxin, beta ( $\beta$ ) blockers:** Decreased effectiveness of cardiac drug
- **Oral antidiabetics and insulin:** Increased risk of hypoglycemia
- **Oral anticoagulants:** Prolonged bleeding
- **Selective serotonin reuptake inhibitor (SSRI) antidepressants:** Decreased effectiveness of thyroid drug
- **All other antidepressant drug categories:** Increased effectiveness of thyroid drug (Ford 483)

Generic	Trade	Dose	Route
Levothyroxine	Levothroid, Levoxyl, Synthroid, Unithroid	Hypothyroidism, thyroid-stimulating hormone suppression, thyrotoxicosis, thyroid diagnostic testing	100–125 mcg/day orally

# Uterine Drugs

## Tocolytics

### How do they work? "Action"

These drugs are used to manage premature labor. Indomethacin is an NSAIDS that inhibits the production of prostaglandins which contribute to uterine contractions. Beta ( $\beta$ )-2-adrenergic and calcium channel blockers are used to delay the delivery process for 24 to 48 hours. These drugs block the contractions of the smooth muscle of the uterus. Magnesium is used drugs to decrease uterine muscle contractions, and is used for seizure control with eclampsia. Magnesium is a calcium antagonist that works to decrease the force of uterine contractions.

### Indications

- Used to stop or decrease uterine contractions in preterm labor

### Adverse Reactions

- Fatigue, flushing, headache, dizziness, diplopia
- Nausea, vomiting, stomach upset, heartburn
- Prolonged vaginal bleeding
- Sweating, hypotension, depressed reflexes, and flaccid paralysis are other adverse reactions associated with IV administration. They are related to hypocalcemia induced by the therapy.

### Contraindications

Magnesium and calcium channel blockers are contraindicated in patients with known hypersensitivity to these drugs, in patients with heart block or myocardial damage, and when the woman is within 2 hours of delivery. (Ford 509)

### Critical Thinking

In case of emergency, when administering magnesium sulfate have calcium gluconate and reflex hammer ready in case of overdose.

### Nursing management

During the ongoing assessment of a patient receiving a tocolytic drug, nursing activities include the following at 15- to 30-minute intervals:

- Obtaining blood pressure, pulse, and respiratory rate
- Monitoring FHR
- Checking the IV infusion rate
- Examining the area around the IV needle insertion site for signs of infiltration
- Monitoring uterine contractions (frequency, intensity, length)
- Measuring maternal intake and output
- Maternal reflexes (if using magnesium) (Ford 509)

### Interactions

- Increase CNS depressant effects of opioid analgesics when given with magnesium

Generic	Trade	Dose	Use
Indomethacin	Indocin	Preterm labor before 31 weeks' gestation	100 mg rectally, then 50 mg orally q 6 hr for a total of 8 doses
Magnesium	n/a	Preterm labor, seizure control	4–6 g IV over 2 min, then infuse 1–4 g/hr
Terbutaline	Brethine	Preterm labor	Subcut: 250 mcg hourly until contractions stop Orally: 2.5 mg q 4–6 hr until delivery (Ford 511)

# Common Drug Antidotes & Therapeutic Ranges

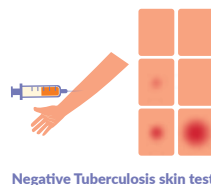
Drug	Antidote
Opioid Analgesics	Naloxone
Heparin	Protamine sulfate
Coumadin	Vitamin K
Benzodiazepines	Flumazenil
Acetaminophen	Acetylcysteine
Magnesium sulfate	Calcium gluconate
Cholinergics	Atropine
Digoxin	Digiband
Beta blockers	Glucagon
Aspirin	Sodium bicarbonate
Cyanide	Sodium thiosulfate

Drug	Therapeutic range
<b>Digoxin</b>	0.5–2.0 mg/ml
<b>Lithium</b>	0.8–1.5 mEq/ L
<b>Dilantin</b>	10–20 mcg/ dL
<b>Theophylline</b>	10–20 mcg/dL
<b>Gentamycin</b>	5–10 mcg/ml (peak), <2.0 mcg/ml (valley)
<b>Vancomycin</b>	20–40 mcg/ml (peak), 5 to 15 mcg/ml (trough)
<b>Carbamazepine</b>	4–10 mcg/ml
<b>Phenobarbital</b>	15–40 mcg/mL
<b>Phenytoin</b>	10–20 mcg/dL
<b>Tobramycin</b>	5–10 mcg/mL (peak), 0.5–2.0 mcg/mL (valley)
<b>Valproic Acid</b>	50–100 mcg/ml

# Tumor Necrosis Factor Inhibitors Etanercept, Infliximab, Adalimumab

## Drug name:

- Etanercept
- Infliximab
- Adalimumab



Negative Tuberculosis skin test



## PATIENT EDUCATION

- **Tuberculosis (TB) Reactivation**
- **Neg. TB skin test** needed to start therapy
- **Vaccines:**
  - Yearly flu vaccine
  - NO Live vaccines (herpes zoster or shingles)
- **Contraindication:**  
Cannot take med: Chronic, reoccurring, or recent infections!

## INTERCEPT



ADALIMUMAD  
INFLIXIMAD

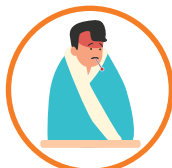
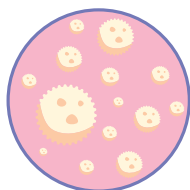
- Etanercept - Intercepts immune response  
- causing immune suppression
- **MAB** ending think **MAD** immune **suppression**  
adalimumab & infliximab

## KEY POINT

### Priority to Report to HCP!

- Elevated WBC
- Fever (over 100.3 F, 38 C)

NCLEX TIP



> 100.3° F / 38°C

## LABs

- **REPORT !** Elevated WBCs
- Elevated CRP  
= **NOT** "the most important" lab

(CRP is the most commonly chosen wrong answer nearly 50% of the time) Elevated CRP is expected with these patients, since there is inflammation all over the body



most commonly  
chosen wrong answer



CRP



Important!

## Notes

# Skeletal Muscle Drugs

## - Uric Acid Inhibitors

### How do they work? "Action"

Allopurinol (Zyloprim) reduces the production of uric acid, thereby decreasing serum uric acid levels and the deposit of urate crystals in joints. This probably accounts for its ability to relieve the severe pain of acute gout. Febuxostat (Uloric), a newer drug, is used to reduce serum uric acid levels, preventing gout attacks.

### Indications

Drugs indicated for treatment of gout may be used to manage acute attacks of gout or in preventing acute attacks of gout (prophylaxis).

### Adverse Reactions

- Headache
- Urinary frequency
- One adverse reaction associated with allopurinol is skin rash, which in some cases has been followed by serious hypersensitivity reactions, such as exfoliative dermatitis and Stevens-Johnson syndrome. Colchicine administration may result in severe nausea, vomiting, and bone marrow depression; therefore, it is used as a second line of treatment when other drugs fail.

### Contraindications

- Colchicine is contraindicated in patients with serious GI, renal, hepatic, or cardiac disorders and those with blood dyscrasias
- Probenecid is contraindicated in patients with blood dyscrasias or uric acid kidney stones, and in children younger than 2 years. If patients are taking azathioprine (Imuran), mercaptopurine, or theophylline they should not be prescribed febuxostat.

### Interactions

#### Allopurinol and febuxostat

- **Ampicillin:** Increased risk of rash
- **Theophylline:** Increased risk of theophylline toxicity
- **Aluminum-based antacids:**
  - Decreased effectiveness of allopurinol
- **Probenecid**
- **Penicillins, cephalosporins, acyclovir, rifampin, and the sulfonamides:** Increased serum level of anti-infective
- **Barbiturates and benzodiazepines:** Increased serum level of sedative
- **NSAIDs:** Increased serum level of NSAID
- **Salicylates:** Decreased effectiveness of probenecid

### Nursing management

- Drink at least 10 glasses of water a day until the acute attack has subsided.
- Take this drug with food to minimize GI upset.
- If drowsiness occurs, avoid driving or performing other hazardous tasks.
- Acute gout—notify the primary health care provider if pain is not relieved in a few days.
- Notify the primary health care provider if a skin rash occurs.
- When using drugs for muscle spasm and cramping:
- This drug may cause drowsiness. Do not drive or perform other hazardous tasks if drowsiness occurs.
- This drug is for short-term use. Do not use the drug for longer than 2 to 3 weeks.
- Avoid alcohol or other CNS depressants while taking this drug.

Generic	Trade	Use	Dose
Allopurinol	Zyloprim	Management of symptoms of gout	100–800 mg/day orally
Colchicine	NA	Relief of acute attacks of gout, prevention of gout attack	Prophylaxis: 0.5–0.6 mg/day orally Acute attack: initial dose 0.5–1.2 mg orally or 2 mg IV, then 0.5–1.2 mg orally q 1–2 hr or 0.5 mg IV q 6 hr until attack is aborted or adverse effects occur

# Urinary Drugs

## - Urinary Anti Infectionives

### How do they work? "Action"

Treat UTIs by either slowing the growth of more bacteria or killing the bacteria. Phenazopyridine is a dye that exerts a topical analgesic effect on the lining of the urinary tract. It does not have anti-infective activity. Phenazopyridine is available as a separate drug but is also included in some urinary tract anti-infective combination drugs. (Ford 531)

### Indications

- Relieves pain associated with UTI
- Retards or halts the growth of bacteria in the urinary tract

### Adverse Reactions

**Adverse reactions are primarily gastrointestinal (GI) disturbances and include the following:**

- Anorexia, nausea, vomiting, and diarrhea
- Abdominal pain or stomatitis

**Other generalized body system reactions include:**

- Drowsiness, dizziness, headache, blurred vision, weakness, and peripheral neuropathy
- Rash, pruritus, photosensitivity reactions, and leg cramps

### Contraindications

- hypersensitivity to the drugs and during pregnancy (pregnancy category C) and lactation (Ford 531)

### Herbal Consideration

Cranberry juice has long been recommended for use in treating and preventing UTIs. Clinical studies have confirmed that cranberry juice is beneficial to individuals with frequent UTIs. Cranberry juice inhibits bacteria from attaching to the walls of the urinary tract and prevents certain bacteria from forming dental plaque in the mouth. Cranberry juice is safe for use as a food and for urinary tract health.

Cranberry juice and capsules have no contraindications, no known adverse reactions, and no drug interactions. The recommended dosage is 9 to 15 capsules a day (400 to 500 mg/day) or 4 to 8 ounces of juice daily (Brown, 2012). (Ford 532)

### Interactions

#### Sulfamethoxazole

- **oral anticoagulants:** Increased risk for bleeding

#### Nitrofurantoin

- **magnesium trisilicate or magaldrate:** Decreased absorption of anti-infective
- **Anticholinergics:** Delay in gastric emptying, thereby increasing the absorption of nitrofurantoin

#### Fosfomycin (Monurol)

- **metoclopramide (Reglan):** Lowers plasma concentration and urinary tract excretion (Ford 532)

### Nursing management

- Check laboratory culture and sensitivity results before giving any antibiotic.
- Phenazopyridine is not administered for more than 2 days when used in combination with an antibacterial drug to treat a UTI. When used for more than 2 days, the drug may mask the symptoms of a more serious disorder.
- Take the drug with food or meals (nitrofurantoin must be taken with food or milk). If GI upset occurs despite taking the drug with food, contact the primary health care provider.
- Take the drug at the prescribed intervals and complete the full course of therapy. Do not discontinue taking the drug even though the symptoms have disappeared, unless directed to do so by the primary health care provider.
- If drowsiness or dizziness occurs, avoid driving and performing tasks that require alertness.
- Avoid alcoholic beverages and do not take any nonprescription drug unless its use has been approved by the primary health care provider.
- Notify the primary health care provider immediately if symptoms do not improve after 3 or 4 days.
- **Nitrofurantoin:** Take this drug with food or milk to improve absorption. Continue therapy for at least 1 week or for 3 days after the urine shows no signs of infection. Notify the primary health care provider immediately if any of the following occur: fever, chills, cough, shortness of breath, chest pain, or difficulty breathing. Do not take the next dose of the drug until the primary health care provider has been contacted. The urine may appear brown during therapy with this drug; this is not abnormal.
- **Methenamine:** Avoid excessive intake of citrus products, milk, and milk products.
- **Fosfomycin** comes in dry form as a one-dose packet to be dissolved in 90 to 120 mL of water (not hot water). Drink immediately after mixing and take with food to prevent gastric upset.
- **Phenazopyridine:** This drug may cause a reddish-orange discoloration of the urine and tears and may stain fabrics or contact lenses. This is normal. Take the drug after meals. Do not take this drug for more than 2 days if you are also taking an antibiotic for the treatment of a UTI. (Ford 533-534)

Generic/Class	Trade	Use	Dose
<b>Fosfomycin</b>	Monurol	Acute bacterial UTIs	3-g packet orally, provided in powder that must be mixed with fluid
<b>Methenamine</b>	Hiprex, Urex	Chronic bacterial UTIs	1 g orally BID
<b>Phenazopyridine</b>	Pyridium	Relief of pain associated with irritation of the lower genitourinary tract	200 mg orally TID

# Urinary

## Drug name:

- Bethanechol



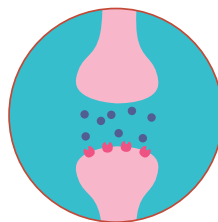
## Memory Trick:

- Bethan-echol
- B**ladder **C**ontrol



## MOA:

Stimulated cholinergic receptors  
= more secretions



## KAPLAN

**Bethanechol** - Used to treat functional urinary retention (neurogenic bladder)

## HESI

**Bethanechol** - Used for urinary atony

- TCAs plus **bethanechol** used to **prevent bladder dysfunction**
- Expected outcome: **Non-distended bladder**

## Indication:

Non obstructive urinary retention specifically neurogenic bladder, where clients with Neuro issues, get loss of strength in the urinary muscles

## Drug name:

- Terazosin
- Tamsulosin



## Memory Trick:

- B**PH
- B**ig **P**rostate **H**olds back urine

## KEY POINTS

### Patient teaching:

- Slow position changes
- Avoid Sildenafil
- Grapefruit juice is actually OK with this drug

## Side Effects:

- Tera**GOOO**sin - Helps w/ urination
- Tera**SLOW**sin - Slow position changes (orthostatic hypotension)
- Tera**LOW** sin - Avoid blood pressure lowering drugs



## Indication:

Urinary retention with enlarged prostate - BPH - benign prostatic hyperplasia

## MOA:

Relaxes smooth muscles in the bladder, prostate & periphery to help release urine



## Drug name:

- Finasteride



## Memory Trick:

If you want a **FUN** ride on a horse, take **FIN**aster**RIDE**



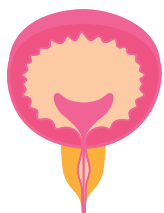
## HESI

What med will **shrink** the prostate = **Finasteride**



## Indication:

Shrinks the prostate



## Top Missed Questions

The nurse is conducting teaching with an elderly patient newly prescribed **terazosin**. Which instruction(s) should be included in the teaching plan? **Select all that apply.**

- ✓ 1. It is not necessary to avoid foods that contain grapefruit.
- ✓ 2. Make sure to change positions slowly while on this medication.
- ✓ 3. I will not take this medication with antacids.
- ✓ 4. Do not take sildenafil while on this medication.
- 5. If you forget a dose of this medication, take two pills as soon as you remember.

## Notes

# Phenazopyridine

## Drug name:

Phenazopyridine  
(Brand: Pyridium))

**NOT an Antibiotic**

## Indication:

UTI Analgesic given for Pain relief during the burning & irritation of UTIs



## Memory Trick:

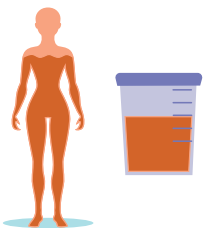
Since its used to ease the fiery burn from UTI's & It turns body fluids **RED** & **ORANGE** Like a FIRE



## KEY POINT

## HESI Question

**Normal** – No need to Report  
**Red + Orange** urine & body fluids



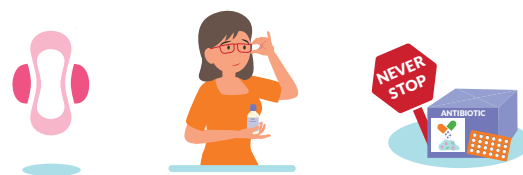
**REPORT:**  
Yellow SKIN / Sclera = Jaundice



Since it pyro-dine, **STAINS** underwear, clothing & bedding

## Patient Teaching:

- Wear **sanitary pads**
- Wear **glasses** instead of contacts while taking medicine
- **NEVER STOP** antibiotic therapy!  
**NOT EVEN** when starting to feel better



Commonly patients **FEEL** better with this med & think the infection is **GONE** So they **STOP** their Antibiotic, that's a **BIG NO NO!**



Always teach clients to **FINISH THE ENTIRE COURSE OF ABX!**



## Notes

# Immunologic Agents

## - Vaccines & Toxoids

### What do they do?

The weakened or killed antigens contained in the vaccine do not have sufficient strength to cause disease. Although it is a rare occurrence, vaccination with any vaccine may not result in a protective antibody response in all individuals given the vaccine.

A toxin that is attenuated (or weakened) but still capable of stimulating the formation of antitoxins is called a toxoid.

### Contraindications

- Immunologic agents are contraindicated in patients with known hypersensitivity to the agent or any component of it. Allergy to eggs is a concern with some vaccines.
- The measles, mumps, rubella, and varicella vaccines are contraindicated in patients who have had an allergic reaction to gelatin, neomycin, or a previous dose of one of the vaccines
- Vaccines and toxoids are contraindicated during acute febrile illnesses, leukemia, lymphoma, immunosuppressive illness or drug therapy, and non localized cancer. Always ask about allergy history before preparing a vaccine for administration.

### Indications

- Routine immunization of infants and children
- Immunization of adults against tetanus
- Immunization of adults at high risk for certain diseases (e.g., pneumococcal and influenza vaccines)
- Immunization of children or adults at risk for exposure to a particular disease (e.g., hepatitis A for those going to endemic areas)
- Immunization of prepubertal girls or nonpregnant women of childbearing age against rubella
- Routine immunization of infants and children
- Immunization of adults against tetanus
- Immunization of adults at high risk for certain diseases (e.g., pneumococcal and influenza vaccines)
- Immunization of children or adults at risk for exposure to a particular disease (e.g., hepatitis A for those going to endemic areas)
- Immunization of prepubertal girls or nonpregnant women of childbearing age against rubella

### Interactions

Vaccinations containing live organisms are not administered within 3 months of immune globulin administration, because antibodies in the globulin preparation may interfere with the immune response to the vaccination. Corticosteroids, antineoplastic drugs, and radiation therapy depress the immune system to such a degree that insufficient numbers of antibodies are produced to prevent the disease. When the salicylates are administered with the varicella vaccination, there is an increased risk of Reye's syndrome developing.

### Nursing management

- Most vaccine preparations require refrigeration. Always have a backup plan for storage of the vaccine should the health care facility lose power. Temperature fluctuations can harm the vaccines.
- Monitor the patient before allowing them to leave after administering any vaccine.
- State agencies, drug companies, and immunization organizations all provide standardized forms for parents or caregivers that document immunization history. In addition to your facility documentation, provide or record on the document presented by the parent or caregiver the following information:
  - Date of vaccination
  - Route and site, vaccine type, manufacturer
  - Lot number and expiration date
  - Name, address, and title of individual administering vaccine

### Adverse Reactions

- Chills, fever
- muscular aches and pains
- Rash
- lethargy

# Anticonvulsants

## - Carboxylic Acid

### How do they work? "Action"

**Carboxylic acid derivatives** increase levels of gamma (γ)-aminobutyric acid (GABA), which stabilizes cell membranes.

### Indications

- Seizures of all types
- Neuropathic pain
- Bipolar disorders
- Anxiety disorders

### Adverse Reactions

- Nystagmus (constant, involuntary movement of the eyeball)
- Ataxia (loss of control of voluntary movements, especially gait)
- Slurred speech
- Gingival hyperplasia (overgrowth of gum tissue)

### Contraindications

Carbamazepine should not be given within 14 days of monoamine oxidase inhibitor (MAOI) antidepressants. Carbamazepine is contraindicated in patients with bone marrow depression or hepatic or renal impairment and during pregnancy (pregnancy category D). Valproic acid (Depakote) is not administered to patients with renal impairment or during pregnancy (pregnancy category D). Oxcarbazepine (Trileptal), a miscellaneous anticonvulsant, may exacerbate dementia.

### Interactions

- Antibiotics/antifungals: Increased effect of the anticonvulsant
- Tricyclic antidepressants: Increased effect of the anticonvulsant
- Salicylates: Increased effect of the anticonvulsant
- Cimetidine: Increased effect of the anticonvulsant
- Theophylline: Decreased serum levels of the anticonvulsant
- Antiseizure medications: May increase seizure activity
- Protease inhibitors: Increased carbamazepine levels, resulting in toxicity
- Oral contraceptives: Decreased effectiveness of birth control, resulting in breakthrough bleeding or pregnancy
- Analgesics or alcohol: Increased depressant effect
- Antidiabetic medications: Increased blood glucose levels

### Nursing management

- Do not omit, increase, or decrease the prescribed dose.
- Anticonvulsant blood levels must be monitored at regular intervals, even if the seizures are well controlled.
- This drug should never be abruptly discontinued, except when recommended by the primary health care provider.
- Do not attempt to put anything in the mouth of a person having a seizure.
- If the primary health care provider finds it necessary to stop the drug, another drug usually is prescribed. Start taking this drug immediately (at the time the next dose of the previously used drug was due).
- Anticonvulsant drugs may cause drowsiness or dizziness. Observe caution when performing hazardous tasks. Do not drive unless the adverse reactions of drowsiness, dizziness, or blurred vision are not significant. Driving privileges will be approved or reinstated by the primary health care provider based on seizure control.
- Avoid the use of alcohol unless use has been approved by the primary health care provider.
- Wear medical identification, such as a Medic Alert tag or bracelet, indicating drug use and the type of seizure disorder.
- Do not use any nonprescription drug unless the preparation has been approved by the primary health care provider.
- Keep a record of all seizures (date, time, length), as well as any minor problems (e.g., drowsiness, dizziness, lethargy), and take the record to each clinic or office visit.
- Contact the local branches of agencies, such as the Epilepsy Foundation of America, for information and assistance with problems, such as legal matters, insurance, driver's license, low-cost prescription services, and job training or retraining.

Generic	Trade	Dose	Use
<b>Valproic acid</b>	DEPAKOTE	Epilepsy, migraine headache, mania	10–60 mg/kg/day orally; if dosage is more than 250 mg/day, give in divided doses

# Vasopressors

## Top Tested Drugs

### Cardiac Pharmacology

#### Epinephrine & Norepinephrine

##### Epinephrine

(Brand: Adrenaline)

##### Norepinephrine

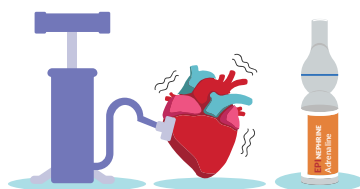
(Brand: Levophed)

##### Key difference

##### Epinephrine

- Cardiac Arrest
  - Asystole
  - PEA (pulseless electrical Activity)

1st line drug



#### HESI Question

##### Epinephrine

Initiates heart contraction during **cardiac arrest**

#### Kaplan Question

##### Epinephrine

treatment is effective if ...

Answer: BP 130/67, Apical HR 99, Cap refill less than 2 seconds



#### Vasopressin & Desmopressin (ADH)

##### Vasopressin

Vasopressin - synthetic ADH (AntiDiuretic Hormone)

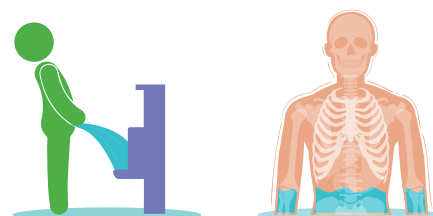
- **ADH** - **A**dds **D**a **H**<sub>2</sub>O

##### Indication

Given for **Diabetes Insipidus (DI)** where clients **D**rain a lot of fluid! ADH is given to "Add Da H<sub>2</sub>O" to the body, adding fluid volume & not affecting the constriction of vessels.

**DI** - **D**iabetes **I**nsipidus

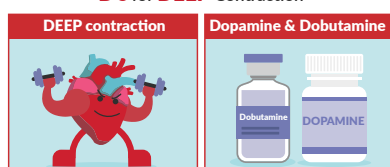
**DI** - end up **D**Iuresing or **D**raIning a lot of fluid



**Pressin** - **P**R**ESS**es that **BP UP**

#### Dobutamine & Dopamine

D's for **DEEP** Contraction



##### Indication

Given to treat **cardiogenic shock** - where the heart **FAILS** to pump! These guys give a **DEEPER** heart contraction, to increase that blood out of the heart & to the body (increasing cardiac output & BP)

**INO**tropic

"**I**Ncreased cardiac contractility"

"**I**Ncreased forceful contraction"



#### HESI Question

##### Dopamine

- Activates **alpha 1** and **beta 1** receptors
- Therapeutic Effects:
  - Low doses act on **dopamine receptors**
  - Moderate doses acts on **beta 1 receptors**
  - High doses acts on **alpha 1** and **beta 1 receptors**
- Assess IV site **hourly** for s/s infiltration



#### Kaplan Question

##### Dopamine

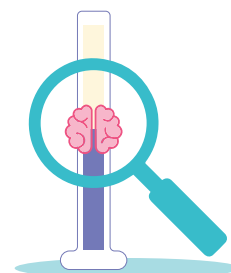
Given for a patient with hypotension, what indicates effectiveness?

Answer: Increased cardiac output

#### ATI Question

##### Dobutamine, Dopamine

- Assess BP hourly
- Monitor vital signs



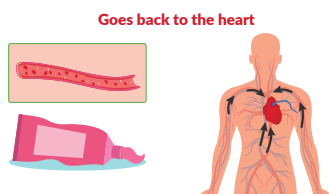
Notes

# Vasopressors

## Alpha & Beta Physiology

### Cardiac Pharmacology

**VasoPRESSors - PRESS** on the vessels

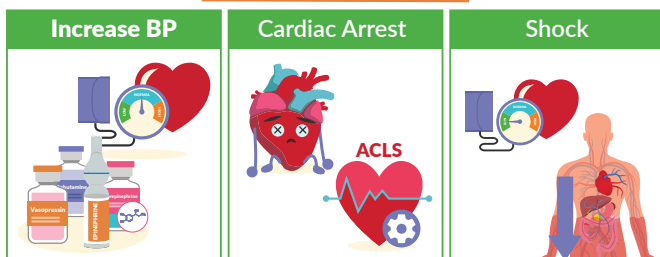


#### Main Vasopressors

- **Epinephrine**
- **Norepinephrine**
- **Vasopressin**
- **Dobutamine**
- **Dopamine**

Vaso**PRESS**ors - **PRESS** on the blood vessels, **increasing blood pressure** in order to squeeze oxygen rich blood back to the CORE of the body to perfuse the vital organs (sort of like squeezing a toothpaste bottle).

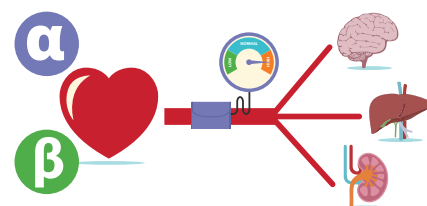
#### Indication



#### Mode of Action

They work by activating **Alpha & Beta receptors** inside the heart & blood vessels

Key Receptors: **Alpha & Betas**



## Alpha 1 - Constriction of Vessels

**Alpha 1 - Anaconda** (memory trick)

- Squeezing down the blood vessels so blood is pushed back to the heart.

**Alpha Agonist**

- Think **AG**onists **ADD** to the BP to increase it (example: vasopressors)

**Alpha Antagonists**

- Are **ANTI** constriction - less constriction = less pressure to lower BP (example: clonidine)



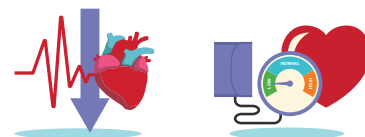
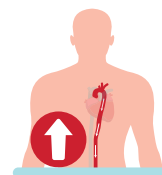
## Beta 1 = 1 Heart

**Beta Agonists** - think **AG**onists **ADD** - Faster heart rate. (example: Vasopressors)

- Positive **Chronotropic** (chronos = time) more beats per minute.
- Positive **Inotropic** = more **FORCEFUL** beats, which increased Cardiac **OUTPUT** (increased blood coming **OUT** of the heart to perfuse the body)

**Beta Antagonists** - are **ANTI** heart, used to decrease the HR & BP (example: beta blockers)

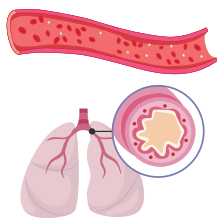
- Negative **Chronotropic** - Less Beats
- Negative **Inotropic** - Less force



## Beta 2 = 2 Lungs

**Beta 2 Agonist**

- Think they **ADD** to the lungs - dilating both the vessels & bronchi - like a big balloon or beach ball (example: Vasopressors & Albuterol)



	Indication	Alpha 1	Beta 1	Beta 2
		<b>Anaconda</b> Constriction	<b>1 heart</b> • Chrono - High HR • Inotropic - C.O.	<b>2 Lungs &amp; Dilation</b> Big Lungs & Vessels
<b>Epinephrine</b>	Septic shock & Cardiac arrest	<b>BIG</b>	Medium	Small
<b>Norepinephrine</b>	Septic shock	<b>BIG</b>	Medium	Small
<b>Vasopressin</b> <b>Desmopressin</b>	Hypovolemic shock	-	-	-
<b>Dopamine</b>	Cardiogenic shock	Med.	<b>BIG</b>	Small
<b>Dobutamine</b>	Cardiogenic shock	Small	<b>BIG</b>	Medium

# Vitamins & Electrolytes

## Iron

Ferrous Sulfate (oral)



Iron Dextran (IV / IM)



### Indication:

Treat anemia r/t iron deficiency



### KEY POINTS

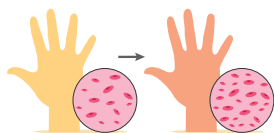
- Dark or black stools = **Normal & Expected** NOT GI BLEED
- Empty stomach **1 HOUR BEFORE** medications

### Kaplan & HESI Question

- Calcium given with ferrous sulfate **BLOCKED Absorption**
- Orange juice/ fruit juice = enhance absorption
- Ferrous Sulfate**  
Teaching is Effective when the Client states: "I will eat more fresh fruits and whole grain bread"

## B12 (Cyanocobalamin)

Indication: Pernicious anemia



### Key Point:

Body lacks intrinsic factors so can't absorb building blocks to make RBCs (iron, folic acid, B12)

## Folic Acid

Patients who lack Folic acid: Anemia (low blood cell count), Sulfa drugs decrease folic acid absorption



- While taking **Sulfa drugs** (Sulfasalazine)
- Folic acid supplement - 1 mg/day



Pregnant patients **HESI**

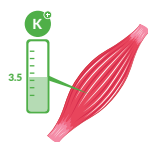
- Prevents** of neural tube defects
- Take before pregnancy



## Potassium K+

### Indication:

Hypokalemia (low K+ below 3.5)



### Memory Trick:



POTASSIUM PUMPS muscles

K+ Wasting Diuretics

"-ide"

- Furose**ide**
- Hydrochlorothiaz**ide**

K+ Sparing Drugs

- S** - Spironolactone
- S** - "-Sartans" Lo**Sartan**
- P** - "-Prils" Lisino**Pril**

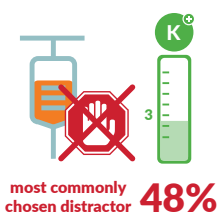


### Key Point:



### KEY POINTS

**SLOW** infusion rate  
if infusion **irritates client**  
reports of burning/ discomfort

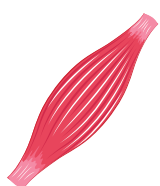


Potassium Pumps the Heart  
**Potassium IV** (Normal 3...5-5.0)

1. First Action = Heart monitor
2. Never push = DEATH
3. ONLY 10-20 mEq/hr! (IV Pump)
4. Slow infusion (if arm burns)

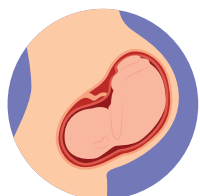
## Magnesium Sulfate

**MAGNESIUM SULFATE**  
**MELLOWS** the muscles



### Indication:

- Preterm labor** = wild contractions
- Anticonvulsant**
- Cardiac** = Torsades de Pointes **NCLEX TIP**



### Key Terms:

#### CAUTION

- Respiratory Depression**
- Paralysis & weak muscles** = Low DTRs



### HESI Question

**Magnesium sulfate ...**  
When to **STOP** the infusion?

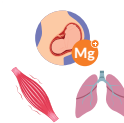
- Respiratory rate below 12
- Decreased DTRs



### ATI Question

Possible findings in a newborn?

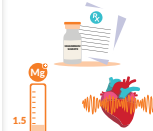
- Flaccid muscle tone
- Respiratory depression



### Kaplan Question

What is the indication for **Mag Sulfate**?

- Replace for low magnesium (below 1.5)
- Treatment for **Torsades de Pointes** **NCLEX TIP**

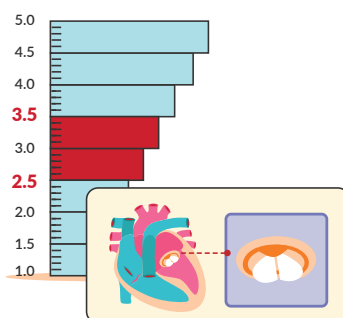


# Anti-Coagulants

## Warfarin

### Key Numbers for NCLEX

- **INR**  
2 - 3 Therapeutic Range  
2.5 - 3.5 (heart valve replacements)
- **Antidote:** Vitamin K  
"K = Kills Warfarin"
- **NCLEX KEY TERMS:**  
Vitamin K  
- **NOT!** given if **warfarin** within **therapeutic range**  
- **NOT!** until **AT LEAST 5 days of warfarin** when switching from IV Hep!!!



\*2.5-3.5 for heart valve replacements

### Vitamin K Foods

- Liver
- Green leafy vegetables (Broccoli, Spinach)
- **Key Patient Teaching:**
  - Consistent & Moderation
  - Keep K - Consistent
  - **Key words:**
    - **NOT** increased
    - **NOT** decreased
    - **NOT** avoid TOTALLY

### NCLEX MEMORY TRICK!

**W** - Warfarin

**W** - War**K**IN

**W**

Warfarin



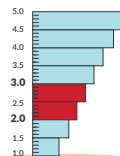
**K**

Vitamin K **Antidote**



**IN**

INR (2-3 range)



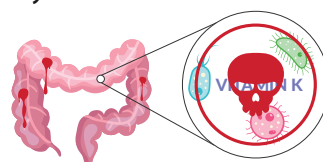
## NICE to KNOW!!

### WARFARIN

Antibiotics **INCREASE** risk for **Bleeding**

By **INCREASING INR**

Since the ABX KILL the intestinal bacteria that produce vitamin K...We have vitamin K deficiency & **INCREASED** risk for **bleeding**



### ATI Question

Client on Warfarin  
Which Statement  
requires **intervention**:

"I will increase my  
intake of dark green  
leafy vegetables"

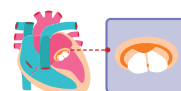
### Common Question on EXIT EXAMS

- **INR of 4 or 5 !!!**
  - **Assess** for Bleeding.
  - Get Vitamin K antidote **READY!!**
- **INR of 2.0 in an ischemic CVA client**
  - **GIVE** the Warfarin to get to 2.5!

### PATIENT TEACHING

#### Key Term:

1. Life Long Therapy
2. Mechanical Valve Replacements
3. Frequent Blood Tests



### Notes



# Withdrawal Meds

## Drug name:

### Methadone

(opioid withdrawal)

## Indication:

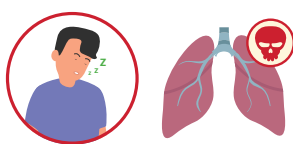
Opioid withdrawal



## Key Points:



- LONG half life
- **Early** signs of Toxicity:
  - N & V and lethargy
  - Frequent emesis
- Monitor:
  - Prolonged QT interval (ECG)
  - O2 Sat less than 90% (95-100% in healthy adults)
  - Client falls asleep easily



## Drug name:

### Disulfiram

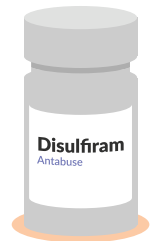
(brand: Antabuse)

## Caution:

alcohol based products with ARTS & CRAFTS

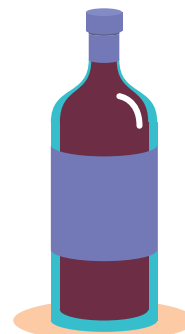
## Indication:

Alcohol withdrawal



## Expected Effects:

Including patient teaching to be caution with working with rubbing alcohol, or alcohol based products with ARTS & CRAFTS could cause a reaction



## Notes