

## Pharmacology Module 2 Exam Review

### **Safe Medication Administration and Error Reduction**

- Chemical Name:
  - Reflects chemical composition
- Generic:
  - Official non proprietary name that United States has given to one medication
- Trade:
  - Brand name, name company decided for a given medication
- Uncontrolled Substances:
  - Do not generally pose a risk for misuse or addiction
  - High therapeutic index
  - Need prescription
- Controlled Substance:
  - Pose a risk for addiction or misuse so they require medical supervisions
  - Ex: Morphine
  - Low therapeutic index
- Schedule I Medications:
  - No therapeutic use at all
  - Ex: heroine
- Schedule II - V Medications:
  - Medications with legitimate application use

### **Chapter 33: Connective Tissue Disorders (DMARDS) Including Glucocorticoids; Anti Gout Meds**

#### **Disease modifying antirheumatic drugs**

- **Drugs**
  - Methotrexate
    - DMARDS I
  - Etanercept
    - DMARDS II

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- Infliximab
  - DMARDS II
- **Therapeutic action:**
  - DMARDS slow joint degeneration
  - Analgesia for
    - Pain, swelling and joint stiffness
  - Used with short term therapy of NSAIDs until long-acting DMARDS take place
  - Management of inflammatory bowel disease
- **Complications**
  - Methotrexate
    - Increased risk of infection
    - Hepatic fibrosis and toxicity
      - Liver and kidney function tests
    - Bone marrow suppression
      - Baseline CBC, repeat every 3-6 months
    - Ulcerative stomatitis/other GI ulceration
- **Contraindications**
  - Methotrexate
    - Pregnancy category X
      - Fetal death
    - Interactions with NSAIDs, sulfonamides, penicillin, and tetracyclines
    - Concurrent with immunosuppressants
      - Increase risk of infection
  - Etanercept
    - Avoid live vaccines
    - Caution in clients with heart failure, CNS demyelinating disease, pre-existing liver dysfunction
    - Concurrent with live vaccines and increase risk of infection

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- **Nursing administration:**
  - Can take 3-6 weeks for DMARDS effects
  - Can take several months for full effect

### Antigout Medication

#### Anti-inflammatory Agents

- **Drugs:**
  - Colchicine
  - Glucocorticoids: Prednisone
- **Therapeutic action:**
  - Colchicine
    - Used for ACUTE gout attack
    - Decrease inflammation
  - Prednisone
    - Clients with acute gout that are unresponsive to NSAIDs
      - Not for those with hyperglycemia

#### Agents for Hyperuricemia

- **Drugs:**
  - Allopurinol
- **Therapeutic action:**
  - Used for CHRONIC gout attacks
  - Inhibit uric acid production
  - Secondary to chemotherapy
- **Complications**
  - Colchicine
    - Mild GI distress
      - Can progress to GI toxicity
      - Abdominal pain, diarrhea, nausea, vomit

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- Thrombocytopenia
  - Low platelets
- Rhabdomyolysis
  - Sudden onset of muscle pain and tenderness
- Allopurinol
  - Hypersensitivity reaction
    - Rash, fever, chills
  - Kidney injury
  - Hepatitis
  - GI distress
    - Nausea and vomiting
- **Contraindications:**
  - Colchicine
    - Severe renal, hepatic, cardiac or GI impairment
    - Statin drugs and high cholesterol
    - Interactions
      - No grapefruit juice
  - Allopurinol
    - Those with medication hypersensitivity
    - Interactions:
      - Slows metabolism of warfarin within liver, increasing risk of bleeding
- **Nursing Administration**
  - Should see a decrease in joint swelling, redness, uric acid levels
  - Decrease in number of gout attacks
  - Decrease in uric acid levels

### **Chapter 34: Bone Disorders**

#### **Calcium supplements**

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- **Drugs**
  - Calcium citrate
- **Therapeutic action**
  - Maintenance of musculoskeletal, neurologic, and cardiovascular function
  - Used for patients with hypocalcemia
  - Those with deficient parathyroid hormone, vitamin D or calcium
- **Complications**
  - Hypercalcemia
    - Calcium levels >10.5
    - Muscle weakness, hypotonia, constipation, vomiting, abdominal pain, lethargy and confusion
- **Contraindications**
  - Clients with hypercalcemia
  - Kidney disease or decrease in GI function
  - Interactions
    - Glucocorticoids decrease absorption of calcium
    - Spinach, rhubarb, beets, bran, and whole grains an decrease calcium absorption
    - Concurrent with digoxin and can cause bradycardia
- **Nursing administration**
  - Chewable tablets provide higher bioavailability
  - IV infusions need to be room temperature
  - Calcium range should be 8.5-10.5

### Selective Estrogen Receptor Modulator (agonist/antagonist)

- **Drugs**
  - Raloxifene
- **Therapeutic action**
  - Decreases bone resorption, which slows bone loss and preserves bone mineral density
  - Works as an antagonist on estrogen

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- **Complications**
  - Risk for pulmonary embolism and deep-vein thrombosis (DVT)
    - Look for red, swollen extremity
    - Discourage long periods of sitting and inactivity
  - Hot flashes
- **Contraindications**
  - Pregnancy category X
    - Fetal death
  - Interactions
    - Concurrent use with estrogen therapy is discouraged
- **Nursing administration**
  - With or without food once a day
  - Bone density scan every 12-18 months
  - Consume adequate calcium and vitamin d
  - Look for increased bone density

### Calcitonin

- **Drugs**
  - Calcitonin-salmon
- **Therapeutic action**
  - Decreases bone resorption by inhibiting the activity of osteoclasts in osteoporosis
  - Increases renal calcium excretion by inhibiting tubular resorption
  - Used for post menopausal osteoporosis
- **Complications**
  - Nausea
  - Nasal dryness and irritation with intranasal route
    - Alternate nostrils daily
- **Contraindications**
  - Clients who have hypersensitivity to fish protein

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- Intranasal spray is only meant for postmenopausal osteoporosis
- **Nursing administration**
  - Chvostek's and Trousseau's signs to monitor for hypocalcemia
  - Look for increase in bone density
  - Calcium levels within 8.5-10.5

### **Chapter 37: Adjuvant Medications for Pain**

Usually an opioid agonist to increase pain relief while increasing pain relief and reducing opioid dosage  
Antagonists. Usually NSAIDs with opioids.

#### **NSAIDs**

- **Complications:**
  - GI distress
    - Black tar
    - Abdominal pain
    - Ulcerations
  - MI or Stroke
  - Bone marrow suppression
- **Contraindications**
  - Use caution with clients with bleeding disorders
  - GI impairment

### **Chapter 38: Miscellaneous Pain Medications**

Migraine headaches can be caused by inflammation and vasodilation of cerebral blood vessels. These can be abortive or prophylactic.

- **Drugs**
  - Acetaminophen
  - Triptans
  - Ergot Alkaloids

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- Ergotamine
- **Therapeutic action**
  - Stop migraine after they have shown signs of beginning or already begun
- **Complications**
  - Acetaminophen
    - Bone marrow suppression
    - GI distress
      - Pain, ulceration, nausea, vomit, and diarrhea or constipation
  - Triptans
    - Chest pressure
      - Considered normal
      - Should go away
        - If it doesn't contact provider = bad
    - Dizziness or vertigo
  - Ergot alkaloids
    - GI discomfort
    - Acute or chronic toxicity
      - Muscle pain, paresthesias in fingers and toes
    - Physical dependence
    - Fetal harm or abortion
      - Category X
- **Contraindications**
  - Ergotamine
    - Renal or liver failure
    - Pregnancy category X
  - Triptans
    - Never used with ergotamine
- **Nursing administration**

## Pharmacology Module 2 Exam Review

- Avoid migraine triggers
- Lay in a dark quiet room
- Should not be used frequently

### Local anesthetics

- **Drugs**
  - Lidocaine
- **Therapeutic action**
  - Decrease pain by blocking conduction of pain impulse in circumscribed area
  - Not for surgery
  - Not for lowering LOC
  - Used for dental or minor surgical procedures
- **Complications**
  - CNA excitation
    - Seizures, respiratory depression, leads to unconsciousness
  - Hypotension
    - Evidenced by bradycardia
  - Spinal headache
  - Urinary retention
    - Can occur with spinal anesthesia
- **Contraindications**
  - Supraventricular dysrhythmias
  - Liver and kidney dysfunction
  - Epinephrine is contraindicated for fingers, nose, and other body parts
    - Gangrene can result due to vasoconstriction
- **Client education**
  - Notify for any signs of infection

### Chapter 43: Principles of Antimicrobial Therapy

## Pharmacology Module 2 Exam Review

- **Suprainfection:**

- Resistance that results when antibiotic kills normal flora (good bacteria), resulting in the emergence of a new infection that is difficult to eliminate
- Thrush
- Vaginal yeast infection
- C-diff

### **Classification of Antimicrobial Medications**

- **Narrow Spectrum Antibiotics:**

- Only a few types of bacteria are sensitive to

- **Broad-Spectrum Antibiotics:**

- Wide variety of bacteria are sensitive

- **BacteriCIDAL medications:**

- Are directly lethal to the micro-organism

- **BacterioSTATIC medications:**

- Slow the growth of the micro-organism
- Immune system response is what actually destroys the bacteria

### **Selection of Antimicrobials**

- **Culture:**

- Aspirate to a culture medium where the colonies grow over several days
- Nurses obtain specimens for culture prior to treatment with antimicrobials

### **Sensitivity of Microorganism to an Antimicrobial:**

For commonly resistant organisms technicians will test against various antimicrobials

- **Minimum Inhibitory Concentration (MIC):**

- Lowest concentration of antibiotic that inhibits bacterial growth completely but does not kill the bacteria

- **Minimum Bactericidal Concentration:**

- Lowest concentration of the antibiotic that kills 99.9% of the bacteria

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\*Providers adjust the antibiotic dosage to produce concentration equal to or greater than the MIC of the same antibiotic\*

### Host Factors

- **Immune System:**

- Intact immune system
  - An antimicrobial works with the host's immune system to suppress micro-organisms
  - Providers will prescribe bactericidal or bacteriostatic antibiotics

- **Site of Infection:**

Some sites are difficult for the antimicrobials to reach.

- Infections in Cerebrospinal Fluid:
  - Antimicrobials have to cross the blood-brain barrier (meningitis)
- Infections of the Heart
  - Endocarditis
  - Infectious bacteria vegetate on the thrombus that develops on the injured endocardium
- Purulent abscesses anywhere:
  - This is due to low blood supply
  - Surgical removal of purulent drainage
    - Increases the effect of antimicrobials
- **Age**
  - Infants:
    - Increased risk for antimicrobial toxicity because of underdeveloped liver and kidney function
    - Causes slow excretion of medication and build up in the body
  - Older Adults:
    - Similar to infants... easily develop toxicity because of the reduction in medication metabolism and excretion

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- **Pregnancy**
  - Antimicrobials can harm developing fetus by crossing over placenta
  - **Sulfonamides:**
    - Can produce kernicterus, severe neurological disorder in newborns
  - **Gentamicin:**
    - Causes hearing loss in infants
  - **Tetracyclines:**
    - Cause discoloration of developing teeth
  - Lactation
    - Usually a contraindication because the possible danger to breastfeeding infants
- **Presence of Previous Allergic Reaction:**
  - Allergy especially with **penicillin**
  - Watch the same class of medications the client is allergic to
  - Signs and Symptoms of allergy:
    - Hives, edema, wheezing
- **Combination Therapy:**
  - Combining more than one antimicrobial
    - Causes an additive, potentiating, or antagonistic effect
    - Prevents bacterial resistance

### Prophylaxis

- Indications of prophylactic use include prevention of:
  - Infections for clients undergoing GI, cardiac, peripheral vascular, orthopedic, or gynecologic surgery

### Preventative Measures

- Perform hand hygiene
- Recognize invasive procedures
  - Urinary catheter, IV catheter, cardiac catheterization, central line

## Pharmacology Module 2 Exam Review

- Instruct clients to take full course of antimicrobials to prevent medication resistance and the occurrence of the infection
- Evaluate for effectiveness of the medications
  - Monitor for clinical improvement
- Inform to take different form of birth control during medication

### **Chapter 44: Antibiotics Affecting Bacterial Cell Wall**

Antibiotics that affect the cell wall are bactericidal. This includes penicillins, cephalosporins, carbapenems and monobactams.

#### **Penicillins**

- **Drugs:**
  - Amoxicillin
  - Ampicillin
  - Nafcillin
  - Oxacillin
  - Ticarcillin
  - Piperacillin
- **Therapeutic action:**
  - Weaken bacterial cell wall
  - Considered beta-lactam antibiotic
    - Means mimics the bacterial structure
- **Complications:**
  - Allergic reaction
    - Anaphylaxis
      - Administer epinephrine
  - Renal impairment
    - Monitor kidney function

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- AST, ALT, BUN & Creatinine should be monitored
- **Contraindications:**
  - History of severe allergic reaction
  - Those with impaired kidney function
    - Acutely ill clients, older clients or younger children
  - Cross allergies
- **Nursing Administration:**
  - Take with meals
  - Complete entire course of medication

### Cephalosporins

- **Drugs:**
  - **First generation:** Cefazolin
  - **Second generation:** Cefaclor
  - **Third generation:** Ceftriaxone, cefotaxime
  - **Fourth generation:** Cefepime
- **Therapeutic action:**
  - Destroy cell wall
- **Complications:**
  - Allergy
    - Watch for cross- allergy to penicillin, don't administer
  - Bleeding tendencies
    - Observe for bleeding
  - Thrombophlebitis
    - Observe injection site
    - Administer dilute intermittent infusion slowly over 3-5 minutes
    - It is a thick shot
  - Renal insufficiency
    - Can give lower dosage to prevent toxicity

## Pharmacology Module 2 Exam Review

- Antibiotic associated pseudomembranous colitis
  - Observe for diarrhea
  - Stop medication right away
  - C-diff = stop
- **Contraindications:**
  - Do not give to client's with severe allergic reaction to penicillin
  - Use cautiously with those who have renal impairment
  - Do not give to those with bleeding disorders
  - Do not use alcohol
- **Nursing Administration**
  - Complete entire course
  - Store in refrigerator

### Carbapenems (NOT ON MEDICATION LIST)

- **Drugs:**
  - Imipenem
  - Meropenem
- **Therapeutic actions:**
  - Beta-lactam antibiotics that destroy cell wall
  - Very broad spectrum antibiotics
- **Complications:**
  - Allergy, specifically cross-sensitivity
    - Monitor signs of allergic reaction
  - GI discomfort
    - Diarrhea, nausea, vomit
  - Suprainfection
    - Oral thrush, vaginal yeast infection
    - Fungal infection
- **Contraindications:**

## Pharmacology Module 2 Exam Review

- Use cautiously with those with renal impairment

### Vancomycin

- **Therapeutic action:**
  - One of the strongest antibiotics, destroys cell wall
  - Used for c-diff or MRSA
- **Complications:**
  - Ototoxicity
    - Hearing loss
  - Red man syndrome:
    - Rashes, fever, tachycardia and hypotension
    - Administer slowly over 60 minutes
  - Renal toxicity
    - Draw peaks and troughs
    - Creatinine and BUN levels
- **Contraindications:**
  - Allergy to corn
  - Use cautiously with older adults with renal impairment or hearing loss
  - Increased risk for ototoxicity for those who are taking meds that also have ototoxicity risk
- **Nursing Administration**
  - Watch renal output, BUN & Creatinine
  - Administer med very slowly
  - Watch for reduction in manifestations
    - Fever, pain, inflammation,
  - Resolution of infection

### Chapter 45: Antibiotics Affecting Protein Synthesis

## Pharmacology Module 2 Exam Review

Antibiotics that affect protein synthesis are bacteriostatic. They treat respiratory, GI, urinary, and reproductive tract infections (UTI's)

### Tetracyclines

- **Drugs:**
  - Tetracycline
  - Doxycycline
  - Minocycline
  - Demeclocycline
- **Therapeutic action:**
  - Broad spectrum, inhibit growth
  - Immune system takes over
  - Mainly UTI's
- **Complications:**
  - GI Discomfort
    - Cramping, nausea, vomiting, diarrhea and esophageal ulceration
  - Hepatotoxicity
    - Hard on the liver
    - tetra=hepato
  - Photosensitivity
    - Intense sunburn
  - Suprainfection
    - Pseudomembranous colitis (D-dif)
      - Diarrhea
    - Yeast infection
  - Dizzy
- **Contraindications:**
  - Pregnancy
    - Can stain the deciduous teeth of the child

## Pharmacology Module 2 Exam Review

- Use cautiously with liver and kidney disease
- Milk product use
  - Ensure ingested 1-2hrs prior to medication administration

- **Nursing Administration**

- Take on empty stomach
- Use other form of birth control
- Do NOT take right before laying down, causes increased risk of esophageal ulceration

### Erythromycin & Axithromycin

- **Therapeutic action:**

- Inhibits growth by impeding protein synthesis, can be bactericidal in high doses

- **Complications:**

- GI discomfort:
  - Nausea, vomit, epigastric pain
- Prolonged QT intervals
  - Dysrhythmias
- Ototoxicity

- **Nursing Administration:**

- Use back up contraceptive
- Monitor liver function periodically if using more than 2 weeks
  - AST, ALT
- Look for resolution of urinary tract manifestations

### Gentamicin

- **Therapeutic action:**

- Treats aerobic gram-negative bacilli

- **Complications: Big Ears and Kidneys**

- Ototoxicity
- Nephrotoxicity
  - Elevated BUN & Creatinine

## Pharmacology Module 2 Exam Review

- Hypersensitivity
  - Paresthesia of hands and feet
- **Contraindications:**
  - Those with renal impairment
  - Do not mix with penicillin
- **Nursing Administration:**
  - Measure Creatinine and BUN
  - Peak:
    - 30 minutes after administration
  - Trough:
    - Right before next dose
  - Look for decrease in UTI manifestations

### **Chapter 46: Urinary Tract Infections Anti-infectives**

#### **Sulfamethoxazole/Trimethoprim (TMP)**

- **Therapeutic action:**
  - Inhibit bacterial growth by preventing synthesis of folic acid derivative[treats UTI's and c-diff
- **Complications:**
  - Hypersensitivity
    - Anaphylaxis
    - Steven Johnson syndrome
      - Rash
  - Blood dyscrasias
    - Hemolytic anemia
    - Agranulocytosis
    - Leukopenia

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- Thrombocytopenia
- Aplastic anemia
  - Obtain blood samples as baseline then check periodically to detect hemolytic disorder
- Crystalluria
  - Crystalline aggregates kidneys, ureters and bladder
  - Crystals in urine
  - Can cause acute kidney injury
- Kernicterus
  - Jaundice
  - Increased bilirubin levels
  - Neurotoxic for newborns
- Hyperkalemia
  - Muscle weakness
  - Monitor potassium levels
- **Contraindications**
  - Impaired kidney function
    - Increased toxicity risk
  - Increased effects of warfarin and hypoglycemics
    - Monitor lab levels
      - PT, INR, blood glucose, phenytoin levels
- **Nursing administration**
  - Take on empty stomach with at least 8 oz of water
  - Complete full course
  - CBC Test (full blood panel)
  - BUN and Creatinine
  - Glucose levels if diabetic
  - Monitor potassium levels

## Pharmacology Module 2 Exam Review

- Check for decrease in UTI manifestations

### **Nitrofurantoin**

- **Therapeutic action:**

- Broad spectrum urinary antiseptic with bacteriostatic and bactericidal. Injures cell by damaging DNA

- **Complications:**

- **GI discomfort**

- Anorexia, nausea, vomit, diarrhea

- Hypersensitivity

- Fever and chills

- Blood dyscrasia

- Hepatotoxicity

- Peripheral neuropathy

- Numbness, tingling of hands and feet

- Chronic kidney disease should not have this medication

- Headache and drowsiness

- **Contraindications:**

- Should not be administered in third trimester of pregnancy can cause hemolytic anemia

- **Nursing administration**

- Turns urine rusty yellow color

- Take with food

- Complete entire course

- Avoid crushing

- Will stain teeth

- Avoid while pregnant

- Follow up with CBC with differential

- BUN and creatinine testing

### **Ciprofloxacin (floxacin)**

## Pharmacology Module 2 Exam Review

- **Therapeutic action:**
  - Broad spectrum
  - Treats
    - Urinary, respiratory, GI, bone, joints, skin and soft tissue infections
  - Prevention of anthrax for those who inhale anthrax spores
- **Complications:**
  - Achilles Tendon Rupture
    - Observe for pain, swelling, and redness at achilles site
    - Stop medication and avoid exercise until inflammation subsides
  - Suprainfection
    - Thrush, vaginal yeast infection
      - Observe and report for signs of yeast infection
    - Phototoxicity
      - Severe sun burns
      - Stop medication if this occurs
- **Contraindications:**
  - Do not administer to those younger than 18 years old there is an increased risk of achilles rupture
  - There is an increase risk for c-difficile
  - There is a risk for
    - Dizziness, confusion and restlessness
- **Nursing Administration**
  - Give lower dose to those with impaired kidney function
  - Look for a decrease in UTI manifestations

### Phenazopyridine

- **Therapeutic action:**
  - Treats symptoms of infection does NOT treat the infection
  - Anesthetic on the mucosa of urinary tract

## Pharmacology Module 2 Exam Review

- Relieves manifestations of
  - Burning with urination, pain, frequency and urgency
- **Nursing administration**
  - Changes urine to an orange-red color
  - Take it with or after meals
  - Can use with cranberry juice for additive effect

### **Chapter 47: Mycobacterial, Fungal, and Parasitic Infections**

Mycobacterium tuberculosis is a slow-growing pathogen that requires long-term treatment. Treatment for TB requires the use of at least two medications at which the pathogen is susceptible. Isoniazid and rifapentine are two effective TB meds.

#### **Isoniazid**

- **Therapeutic action:**
  - Inhibits growth of mycobacteria by preventing synthesis of mycolic acid in the cell wall
  - Latent
    - Tests positive, no signs or symptoms of TB and cannot spread
    - Requires isoniazid daily for 9 months
  - Active
    - Tests positive, has signs and symptoms and can transmit TB to others
    - Several antimycobacterials are used to treat TB
  - Takes 6-9 months to treat TB
- **Complications:**
  - Peripheral neuropathy
    - Tingling and numbness in hands and feet
  - Hepatotoxicity
    - Anorexia, malaise, fatigue, nausea, and yellowish discoloration of skin and eyes

## Pharmacology Module 2 Exam Review

- Monitor liver function
  - AST and ALT
- Hyperglycemia
  - Clients with diabetes mellitus
- **Contraindications:**
  - Clients with liver disease
  - Clients with alcohol use disorder
  - Avoid alcohol consumption/use when taking meds
- **Nursing Administration:**
  - Administer orally
  - Direct observation therapy for active TB
  - Orange urine, sweat, and tears
  - Take 1-2hrs after meals
  - Complete full prescribed amount even if symptoms resolve

### Rifampin

- **Therapeutic action:**
  - Always given in combination with at least one other anti tuberculosis medication to prevent resistance
  - Lower side effects with other meds
- **Complications:**
  - Hepatotoxicity
    - Monitor AST, ALT
    - Jaundice, anorexia, malaise
  - GI
    - Abdominal discomfort
- **Contraindications**
  - Use cautiously with those with impaired liver function

## Pharmacology Module 2 Exam Review

- **Nursing Administration**

- 1-2hr before meals
- Complete full course
- Look for improvement in symptoms
  - Clear breath sounds, no night sweats, increased appetite, no afternoon rise in temperature
- Usually takes 3-6 months to achieve relief and eradicating TB

### Antiprotozoals

- **Drugs:**

- Metronidazole

- **Therapeutic action:**

- Treat c-diff
- Prophylaxis for clients who will have surgical procedures
  - Vaginal abdominal colorectal surgery
- Treat H. pylori

- **Complications:**

- GI discomfort
  - Dry mouth, and metallic taste
- Darkening of Urine
- Neurotoxicity (CNS effects)
  - Numbness of extremities, ataxia and seizures
    - Stop medication if this occurs
  - Pseudomembranous colitis
    - Fever, chills, diarrhea, abdominal pain, bloody stool

- **Contraindications**

- Avoid any alcohol products
  - Causes disulfiram-like reaction

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- Facial flushing, vomit, dyspnea, tachycardia

### Antifungals

- **Drugs**

- Nystatin
- Amphotericin
- Ketoconazole
- Fluconazole

- **Therapeutic actions:**

- Treat systemic fungal infection

- **Complications:**

- Infusion reaction
  - Fever, chills, and headache
  - Do a test dose of 1 mg
- Thrombophlebitis
  - Administer in a large vein
- Nephrotoxicity
  - Flank pain
  - Obtain baseline BUN and Creatinine, follow with weekly kidney monitoring
- Electrolyte imbalance
  - Monitor electrolyte levels
  - Specifically potassium
  - Administer supplements
- Bone marrow Suppression
  - Obtain baseline CBC and Hct
    - Monitor weekly

- **Contraindications:**

- Impaired kidney function due to higher risk for nephrotoxicity
- Griseofulvin is pregnancy risk category X

## Pharmacology Module 2 Exam Review

- **Nursing administration:**
  - Infuse slowly over 2-4 hours IV
  - Kidney injury is lessened when
    - Diluted in normal saline

### Chapter 48: Viral Infections, HIV, and AIDs

#### Acyclovir

- **Therapeutic actions:**
  - Prevent reproduction of viral DNA thus interrupting cell replication
  - Treats herpes simplex and varicella-zoster viruses
- **Complications:**
  - Phlebitis at admin site
  - Nephrotoxicity
    - Administer slowly over 1 hour
    - Administer IV fluids and increase fluid intake
- **Contraindications**
  - No sexual activity should take place with lesions present, use condom at all times
- **Nursing administration**
  - IV slowly over at least one hour or longer
  - Expect relief but NOT A CURE

#### Antiretrovirals: NRTI's (HIV/AIDS)

##### Zidovudine

- **Therapeutic actions:**
  - Reduces HIV manifestations by inhibiting DNA
  - First-line antiretrovirals treat HIV infection in short-term care
- **Complications**
  - Suppressed bone marrow
    - Monitor for bleeding, easy bruising, sore throat, and fatigue

## Pharmacology Module 2 Exam Review

- Lactic acidosis
  - Hyperventilation
  - Nausea
  - Abdominal pain
- Nausea, Vomit, Diarrhea
- Hepatomegaly
  - Monitor enzymes
- **Nursing Administration**
  - Obtain baseline CBC and platelets
  - AST and ALT monitoring
  - Take exactly as prescribed
  - Reduction in manifestations

### Autonomic Nervous System Agents

#### Neurons

- **Afferent**
  - Send impulses to CNS
  - Sensory
- **Efferent**
  - Receive the impulses from the brain
  - Motor

#### Adrenergic receptor organ cells

- Alpha 1
- Alpha 2
- Beta 1
- Beta 2

#### Sympathetic vs Parasympathetic

- Sympathetic
  - Stress response

## Pharmacology Module 2 Exam Review

- Fight or flight
- Increased heart rate
- Breath shallow and fast
- Inactive gut
- Blood rushes away from brain
- Expend energy
- Parasympathetic
  - Relaxation
    - Slowed heartbeat
    - Breath full and slow
    - Active gut
    - Conserves energy

### Adrenergic Agonists

Stimulate the sympathetic nervous system.

- **Alpha 1**
  - Increases peripheral resistance
  - Increases preload, which improves circulation
  - Increased blood pressure
- **Alpha 2**
  - Blood pressure decreases
- **Beta 1**
  - Primarily in the heart
  - Increases heart rate
- **Beta 2**
  - Primarily in the lungs
  - Causes bronchodilation
  - Increase blood flow to skeletal muscles
- **Adrenergic Uses/Side effects**

## Pharmacology Module 2 Exam Review

- Asthma, anaphylaxis, hypotension/shock
- Restlessness, nervousness, tachycardia, angina, tremors, nausea/vomiting, hypertension, seizures

### **Adrenergic Blockers**

Blocks sympathetic nervous system. Blocks epinephrine.

- **Beta blockers**
  - End in -lol
    - Propranolol
    - Atenolol
    - Metoprolol
- **Alpha blockers**
  - Clonidine
  - Phentolamine
  - Doxazosin
- **Side effects**
  - Bronchoconstriction
  - Decreased cardiac output and pulse rate
  - Hypotension

### **Cholinergic Agonists**

“Rest and digest”. Opposite of adrenergic medications. Similar to adrenergic blockers.

- **Effects**
  - Decreased pulse and blood pressure
  - nausea ,vomit, diarrhea (GI)
  - Sweating
  - Salivation
  - Excessive mucus
- **Uses/Examples**
  - Use

## Pharmacology Module 2 Exam Review

- Urinary retention, Alzheimer's, Myasthenia gravis
- Examples
  - Urecholine, bethanechol, donepezil, neostigmine, edrophonium
- **Side Effects**
  - **SLUDGE**
    - Salivation
    - Lacrimation
    - Urinary incontinence
    - Diarrhea
    - Gastrointestinal cramps
    - Emesis

### Anticholinergics

Works against the parasympathetic nervous system. Similar actions to adrenergic medications.

- **Effects**
  - **Decreased secretions**
    - Can't see
    - Can't pee
    - Can't spit
    - Can't shit
- **Side effects**
  - "Hot as a hare"
  - "Mad as a hatter"
  - "Red as a beet"
  - "Dry as a bone"
  - "Blind as a bat"

### Exam 2 Lab Value Ranges:

- **RBC:**

## Pharmacology Module 2 Exam Review

- Men- 4.7 - 6.1 million cells/mcL
- Women – 4.2 - 5.4 million cells/mcL.
- **WBC:**
  - 4,500 to 11,000 WBCs per microliter
- **PLT:**
  - 150,000 to 400,000 platelets/mcL
- **Vancomycin Peak/Trough**
  - Peak: 20–40 mg/L
  - Trough: 1-20 mg/L
- **Creatinine**
  - 0.9-1.3
- **BUN**
  - 10-20