

This medications onset time is 5-15 minutes so this medication should be taken in close proximity to a meal

**Humalog**

On a thin patient, this angle is best when giving a subcutaneous injection

**45 degrees**

This is what diabetics should do prior to exercise

**Eat a snack or a meal**

This class of medications can increase sugar levels causing a need for more insulin

**Glucocorticoids**

This is the drug of choice for a hyperglycemic patient who is unresponsive and has no IV site

**Glucagon**

If a patient presents with UTI-like symptoms, this must be done prior to administering any antibiotics

**Obtain a urinalysis and/or urine culture**

These are the routes of administration for glucagon

**Subcutaneous, IM, and IV**

Stopping the administration of this drug class abruptly can cause Addison's disease

**Glucocorticoids**

Smoking, age (35 and older), uterine cancer, pregnancy, and a history of DVT are all contraindications for this class of medication

**Hormonal contraceptives**

Administration of this hormone medication should be first thing in the morning and on an empty stomach

**Levothyroxine**

For children under 8 years of age, teeth discoloration is a common side effect of this drug

**Tetracycline**

Steroids, diphenhydramine, and epinephrine can be given to reduce the symptoms of this

**Allergic reaction**

This class of antibiotics when mixed with alcohol can cause a disulfiram reaction

**Cephalosporins**

Azithromycin falls into this class of antibiotics

**Macrolides**

A compromised immune system and antibiotic use can put patients at risk for developing this **Super infection**

Antitubercular medications can cause these lab values to be elevated Liver function tests  
**(LFTs)**

Red-pink urine, elevate temperature, and elevated kidney function tests can be caused by this **Urinary tract infection**

Elevated serum uric acid and WBCs are expected in this disease process  
**Gout**

This class of antibiotics is associated with hepatotoxicity, so liver function must be closely monitored

**Macrolides**

This disease process is present when a patient has an elevated TSH and decreased T3 and T4  
**Hypothyroidism**

Patient education for Nystatin/mycostatin includes this  
**Do not eat or drink anything directly following a dose**

A patient on oral contraceptives who is prescribed tetracycline should be told to do what  
**Use 2 forms of birth control**

Patient education for this class of medication should include, avoid minerals such as iron or zinc, avoid direct sunlight, and report calf tenderness

**Fluoroquinolones**

Tachycardia, hypertension, palpitations, and seizures are all adverse reactions of this thyroid condition

**Thyroid Storm**

This can be caused when antibiotics are taken for viral infections, stopped prior to therapy condition, or the same medication is used over and over

**Resistance**

Patient education for this hormone replacement drug is to take the lowest dose possible to achieve the intended effect and to not take for more than 5 years

**Premarin**

Patient education for this drug includes it can turn urine orange and painful bladder spasms should be reduced

**Pyridium**

This is the next step for anyone who may have been exposed to tuberculosis  
**Have a PPD performed**

Patients taking this antibiotic should be educated on using a barrier-method form of birth control  
**Tetracycline**

If a patient who is taking an antibiotic notices raised, itchy, red bumps on their body, you should educate the patient to do this

**Stop the medication and notify their provider**

A term that means, to slow bacteria

**Bacteriostatic**

A term that means, to kill the bacteria

**Bactericidal**

A term that refers to a type of infection difficult to treat and often resistant to multiple drugs

**Superinfection**

A potentially life threatening allergic reaction that causes mucous membrane swelling and airway constriction

**Anaphylaxis**

The name of a serious side effect of antibiotic use that causes blistering skin and mucous membrane rash

**Steven Johnson syndrome**

An antibiotic often prescribed when a patient is allergic to penicillin

**Erythromycin**

An antibiotic used to treat acne and chlamydia

**Tetracycline**

A fluoroquinolone antibiotic used to treat Anthrax and UTI

**Ciprofloxacin (cipro)**

Which medication is often prescribed to treat fungal infections of the mouth associated with oral steroid use

**Nystatin**

The class of antibiotics that is effective against Legionella, Pertussis and H. Pylori

**Macrolides**

All antibiotics should be taken with adequate amounts of what, in order to protect the kidneys?

**Water**

If ordered, the antibiotic ceftriaxone (Rocephin) can be mixed with what, to reduce the pain of an IM injection

**Lidocaine**

If you're administering an IV antibiotic and the patient develops a rash, what should you do

**Stop the infusion and alert the physician**

Which medication requires peak and trough levels to be drawn to ensure maximum effective as and limit renal injury

**Vancomycin**

A patient with tuberculosis will likely be on more than one antibiotic due to the likelihood of the bacteria developing what

**Resistance**

Antibiotic use in women can lead to what type of vaginal infections

**Fungal (yeast, candidiasis)**

Red man syndrome is associated with what antibiotic

**Vancomycin**

An antibiotic that can stain the teeth of young children, causes photosensitivity and should not be taken with milk

**Tetracycline**

These classes of antibiotics can lead to hearing loss

**Aminoglycosides, glycopeptides (vancomycin)**

A patient taking metronidazole (Flagyl) should avoid

**Alcohol**

A patient on oral contraceptives who is prescribed antibiotics should be told to do what

**Use two forms of birth control**

If a patient is started on a new antibiotic and develops wheezing, they should do what

**Seek emergency medical treatment**

Patients who are taking warfarin (Coumadin) and prescribed antibiotics should be sure that have what checked regularly

**The INR**

Viruses and fungi are not susceptible to what type of anti-infective medication

**Antibiotics**

Azithromycin has an extended what, that makes the course needed, shorter than most other antibiotics

**Half life**

A patient on the antiviral acyclovir should have the function of which organs, closely monitored

**Kidneys**

Isoniazid, used to treat TB can cause serious problems with which organs

**Liver**

A patient on antiretroviral medications for HIV, should be told do what, often, in order to prevent opportunistic infections from occurring

**Wash their hands**

Cylophosphamide (cytoxan) can cause hemorrhagic inflammation of which organ

**Bladder**

Cyclophosphamide (cytoxan) should be taken at what time of the day and accompanied by what

**Early in the day, water**

What % of the world's population is infected with tuberculosis

**25**

Bodily secretions may be stained orange by which medication

**Rifampin**

How many people die of malaria each year?

**One million**

A disulfiram reaction most commonly occurs in what two types of antibiotics

**Cephalosporin & metronidazole**

How many people are estimated to have died in the influenza pandemic of 1918-1919

**30-50 million**

A normal CD4 T-helper cell count is

**>500 cells/mm (cubed)**

Anesthetic eye drops should only be administered under what conditions

**Strict medical supervision**

Potential side effects of Lantanoprost (xalatan) eye drops include

**Permanent darkening of the iris of the eye, increase in length, number, thickness and darkness of eyelashes, respiratory problems**

silver sulfadiazine (SSD) cream for burns should not be used on what body parts due to risk or permanent dyeing of the skin?

**Face & hands**

Isotretinoin (amnesteem, Accutane) used to treat severe cystic acne is pregnancy category **X**

Fluroquinolones antibiotics like ciprofloxacin can result in what connective tissue complication, especially when combined with steroids

**Tendon rupture**

Patients with a sulfa allergy are at an increased risk for allergies to which medications

**Glucotrol, celecoxib, furosemide**

If a patient has a mild allergic reaction, they may be treated with an antihistamine such as

**Diphenhydramine**

A macrolide antibiotic, excreted in the bile of the liver that is a good choice for patients with renal impairment is

**Erythromycin**

Peak and trough levels are ordered with vancomycin in order to ensure safety, efficacy and what two other things

**Metabolism & excretion**

Ciprofloxacin (Cipro) should not be taken with products containing which of the following

**Antacids, aluminum, iron, zinc**

Signs & symptoms of thyroid storm include

**Tachycardia, anxiety, hypertension**

A patient on desmopressin needs to have what serum lab value monitored closely

**Sodium**

A patient with hypothyroidism who takes levothyroxine may be expected to experience what effects

**Weight loss, increased energy levels, improved cold tolerance**

What medication, if abruptly discontinued can cause adrenal gland insufficiency

**Prednisone**

Levothyroxine does what

**Increases improvement in thyroid**

What should be administered only if the patient is unresponsive

**Glucagon**

What medication interaction will you assess for prior to giving a prescription for sildenafil (Viagra)

**Nitrates**

Hormone replacement should be taken less than how many years

**5**

Combined hormonal contraceptives are contraindicated for women with what

**History of blood clots, currently pregnant, suspected breast cancer, over 35 and smokes >15 cigarettes a day**

H2 receptor agonist-Treats

**duodenal ulcers and gastric ulcers, also prevents return by decreasing acid release in evenings.**

H2 receptor agonist-Side effects

**diarrhea, difficulty sleeping, dry mouth, dry skin, headaches, ringing in ears, runny nose, trouble, urinating.**

H2 receptor agonist-Teachings

**take with 1st meal of day, if missed take asap until next dose is soon.**

**Cig smoking can decrease effects of H2 receptor's by increasing acid production in stomach.**

Proton Pump Inhibitors-Treats

**Reduces amount of acid made in stomach. Treats: acid reflux and ulcers.**

Proton Pump Inhibitors-Side effects

**None**

Proton Pump Inhibitors-Teachings

**avoid booze, aspirin products, ibuprofen, and certain foods.**

Mucosal protectants-Treats

**protects the mucosal lining of the stomach from gastric acid.**

Mucosal protectants-Side effects

**pain, coughing, vomiting of blood**

Mucosal protectants-Teaching

**increases fluids, dietary bulk, and exercise can relieve constipation, and relaxation techniques.**

Mucosal protectants-monitor

**severe persistent constipation**

Antacids-Treat  
**relieve acid ingestion, upset and sour stomach, and heart burn. Can also help with ulcers.**

Antacids-Side Effects  
**diarrhea with patients with renal failure. Can increase mag levels in blood.**

Antacids-teachings  
**Antacids with mag and calcium should ab avoided with those with renal failure.**

Antiemetics- Treat  
**vomiting and nausea. Some feel antihistamines block H1 receptors in brain that casues nausea.**

Antiemetics- Side effects  
**drowsiness and dizziness, gastrointestinal disturbances.**

Antiemetics-Teaching  
**Lots of fluids, PG or lactating experiencing nausea and vomiting consult physician prior to use.**

Laxatives- Treat  
**loosen stool and increase bowel movement. Does by increasing water secreted into the bowels.**

Laxatives-Side effects  
**Bloating, cramping, diarrhea, nausea, gas, thirst**

Laxatives-Teaching  
**lots of fluids, and 20g of fiber, exercise regularly**

Antidiarrheals- Treat  
**slows movement of the gut. Decrease number of bowel movements and makes stool less watery.**

Antidiarrheals-Side effects  
**Dizziness, drowsiness, tiredness, and constipation**

Antidiarrheals-teaching  
**If you develop blood in stool, fever, or uncomfortable fullness/swelling in abdomen seek medical attention.**

Transdermal agents- placement and rotation  
**put in area on little movement and fat tissue. wash area before and after treatment. Don't put in same skin area.**

**Transdermal agents-**

Scopolamine Patch

Anticholinergic drug patch applied to skin, prevents nausea and vomiting caused by motion sickness; or from anesthesia for surgery.

**Reproductive agents-**

What is safe to take while PG? Category A  
safest drug to take while PG, no known adverse reactions.

Reproductive agents-

What is safe to take while PG? Category B  
No risk has been found in humans.

Reproductive agents-

What is safe to take while PG? Category C  
Not enough research has been done to determine if drugs are safe.  
Reproductive agents-

What is safe to take while PG? Category D  
Adverse reactions have been found in humans.  
Reproductive agents-

What is safe to take while PG? Category Z  
Should never be taken while PG.  
Aspirin while PG- low dose  
60-100 mg daily sometimes recommended for PG women with recurrent pregnancy loss, clotting disorder, and preeclampsia.  
Aspirin while PG- higher dose  
various risk depending on trimester.

1st-concern for PG loss and congenital effects

3rd-risk of premature closure of fetus's heart. Can also increase bleeding in brain and premature infants.

iron supplements during PG  
Greatest demands occurs during 3rd trimester. Those at risk for anemia should take 60-120 mg daily.

Advise patients to take what while PG?

Vitamin C increases absorption of iron.

Reproductive agents-

**Premarin-** how long is it safe to use?

Only use hormone therapy for treatment of menopausal symptoms, and at lowest possible dose for shortest possible time. FEWER THAN 5 YEARS!!

### **Reproductive agents-**

Premarin- why use it?  
improves vasomotor symptoms and vaginal dryness.

vasomotor symptoms- disrupt sleep, irritability, mood swings, depression, and concentration issues.

### **Reproductive agents-**

Premarin- risks with pro-longed use?  
Increased risk of myocardial infarction, stroke, breast cancer, pulmonary emboli, DVT, and dementia in post menopausal women.

### **Reproductive agents-**

Premarin- Dosing?  
osteoporosis/ menopausal symptoms-PO 0.3-1.25 mg daily (3 wk on 1 off)

Start at lowest does possible and treat less than 5 years!

### **Reproductive agents-**

Premarin- Dosing? Atrophic Vaginitis  
PO 0.3- 1.25 mg daily (vaginal) 0.5- 2 g cream (daily for 3 wks then off for 1 wk, repeat)

Start at lowest does possible and treat less than 5 years!

### **Reproductive agents-**

Tadalafil (Cialis)- like Viagra-TREATS  
erectile dysfunction  
Reproductive agents-

Tadalafil (Cialis)- like Viagra-NEED TO KNOW ABOUT PATIENT TAKING MED  
If taking any nitrate containing drugs. They can cause life threatening hypotension.

Tadalafil (Cialis)- Contradictions  
unstable angina, recent stroke, life threatening heart failure within 6 months, uncontrolled hypertension, arrhythmias, myocardial infarction with in 6 months.

### **Reproductive agents-**

Oral birth control- risks with use?  
increased hypertension, arterial blood clot and possible myocardial infarction.

**SMOKERS RISK FOR BLOOD CLOTS!!**

Reproductive agents-  
Plan B- important to ask?

How many hours since last sexual intercourse?

Most effective after 72 hours after intercourse may be given up to 120 hours after.

### **Antineoplastic Agents**

most at risk for infection during chemo?

**7-10 days after chemo treatment blood count is at its lowest**

Antineoplastic Agents

What to watch for during chemo infusions?

**Monitor IV site frequently for irritation and phlebitis.**

**Monitor labs (BUN, CBC, creatinine, liver panel, and electrolytes.)**

Antineoplastic Agents

What to watch for during chemo infusions? (low RBC count)

**(anemia) Assess fatigue, hypotension, tachycardia, tachypnea, oliguria (< 1 ML urine output)**

Antineoplastic Agents

What to watch for during chemo infusions? (low WBC count)

**(leukopenia) can get infection easily, avoid sick people.**

Antineoplastic Agents

What to watch for during chemo infusions? (low platelet count)

**(thrombocytopenia) bruising, gums bleed, and nose bleeds are all signs.**

Antineoplastic Agents

What to watch for during chemo infusions? (anorexia)

**loss of appetite**

Antineoplastic Agents

What to watch for during chemo infusions? (nausea and vomiting)

**antiemetics before, during, and after chemo. enforce frequent mouth rinse**

Antineoplastic Agents

cyclophosphamide (Cytoxan)- TEACHING

**take early to prevent accumulation in bladder at night.**

diet low in purines (**organ meats, beans, and peas**)- to alkalinize urine.

**no citric acid**

**Use soft toothbrush with good oral hygiene**

Antineoplastic Agents

cyclophosphamide (Cytoxin)- SIDE EFFECTS

**Pulmonary fibrosis (lung scarring), myocardial fibrosis, hemorrhagic cystitis (blood in the urine), anorexia, nausea, vomiting, alopecia (hair loss), leukopenia, and thrombocytopenia**

**Antineoplastic Agents**

cyclophosphamide (Cytoxin)- USE

**activity against Hodgkin and non hodgkin lymphoma, acute/ chronic lymphocytic leukemia, multiple myeloma, breast/ ovarian carcinoma, lung cancer, and retinoblastoma.**

**Also with Lupus and renal failure**

**Antineoplastic Agents**

cyclophosphamide (Cytoxin)-REPORT TO NURSE/DOCTOR

**Fever (decreases immunity)**

Gout/Rheumatoid Arthritis Agents

Infliximab (Remicade)-TREATS

**Rheumatoid arthritis , crohn's disease,**

Gout/Rheumatoid Arthritis Agents

Infliximab (Remicade)-LABS TO MONITOR

**Liver function test periodically. May cause increase of ALT, AST without progression to liver dysfunction.**

Gout/Rheumatoid Arthritis Agents

Infliximab (Remicade)- SIDE EFFECTS

**Fatigue, headache, upper respiratory infection, abdominal pain, nausea, vomiting, infections , malignancy, fever, sarcoidosis ( collections of inflammatory cells ), infusion reactions.**

Gout/Rheumatoid Arthritis Agents

Infliximab (Remicade)- TEACHINGS

**Call if fungal infection symptoms occur.**

**May cause dizziness avoid driving or any other activities that require alertness.**

Gout/Rheumatoid Arthritis Agents

Probenecid (Benemid)-TREATS

**Hyperuricemia (excess of uric acid in the blood) associated with gout and gouty arthritis.**

Gout/Rheumatoid Arthritis Agents

Probenecid (Benemid)-MONITOR LABS

**Acid based balances (blood gases), serum uric acid, urinary uric acid, renal function, and CBC.**

Gout/Rheumatoid Arthritis Agents

Probenecid (Benemid)-SIDE EFFECTS

**Headache, dizziness, hepatic necrosis ( toxic injury to the liver), nausea, vomiting, uric acid stones with or without hematuria (RBC in urine), aplastic anemia (deficiency of all types of blood cells), leukopenia, sore gums, anaphylaxis (allergic reaction)**  
Gout/Rheumatoid Arthritis Agents

Probenecid (Benemid)-TEACHING  
**May experience dizziness, headache, lack of appetite, flushing, nausea, vomiting, gum edema/soreness, or alopecia.**  
Gout/Rheumatoid Arthritis Agents

Probenecid (Benemid)-TEACHING REPORT ASAP Kidneys  
**Signs of kidney problems (urinary retention, hematuria (RBC in urine) , change in amount of urine passed, or weight gain.**  
Gout/Rheumatoid Arthritis Agents

Probenecid (Benemid)-TEACHING REPORT ASAP Liver  
**Dark urine, fatigue, lack of appetite, nausea, abdominal pain, light colored stool, vomiting, jaundice, signs of kidney stones.**  
Gout/Rheumatoid Arthritis Agents

Probenecid (Benemid)-TEACHING Significant reactions  
**Wheezing, chest tightness, fever, itching, bad cough, cyanosis, seizures, swelling of face, lips, or throat.**  
Endocrine Agents

Anterior and posterior Pituitary hormones  
**Growth hormones, Thyroid-stimulating hormone, Adrenocorticotropic hormone (adrenal gland), Prolactin (breast tissue), Gonadotropins (ovaries and testes)**  
Endocrine Agents

Desmopressin acetate (DDAVP) ASSESS WITH MED  
**Urine output and serum sodium. Can cause urine retention and dilution of sodium. If low HOLD MED and consult doctor.**

Normal sodium 135-145  
**Low sodium-dilutional hyponutrition can cause edema.**  
Endocrine Agents

Thyroid Hormones- Hypothyroidism  
**Increase in thyroid stimulating hormone TSH. Myxedema is severe hypothyroidism.**  
Endocrine Agents

Thyroid Hormones- levothyroxine sodium (Synthroid) CHANGES IN PATIENT  
**Increases energy, lower TSH**

Thyroid Hormones- levothyroxine sodium (Synthroid)-LABS

**Contra in patients with thyrotoxicosis (hyperthyroidism), acute myocardial infarction, adrenal insufficiency. Maybe EKG??**

Endocrine Agents

Thyroid Hormones- levothyroxine sodium (Synthroid)- WHEN TO TAKE  
**Before Breakfast**

Endocrine Agents

Thyroid Storm-SIDE EFFECTS

**Fever, rapid pulse, insomnia, nervousness, diarrhea.**

Endocrine Agents

Hyperthyroidism

**Graves disease-hyperfunctioning, rapid pulse, palpitations, excess perspiration, heat intolerance, irritability, bulging eyes, weight loss.**

Endocrine Agents

Glucocorticoids/ corticosteroids-TREAT

**Cause immunosuppression watch for impaired wound healing \*\*diabetics\*\* and fever**

Endocrine Agents

Glucocorticoids/ corticosteroids- MONITOR

**watch for impaired wound healing \*\*diabetics\*\* and fever.**

If diabetic **blood glucose will rise and require insulin.**

Glucocorticoids/ corticosteroids-TEACH  
**hand washing to decrease infection.**

Endocrine Agents

Glucocorticoids/ corticosteroids-GOALS

RH. Arthritis- increase range of motion,

ulcerative colitis-**decrease inflamm. of colon**

asthma-**decrease inflamm. of lungs** Endocrine Agents

Glucocorticoids/ corticosteroids- EFFECTS ON BODY

Suppresses inflammation, immune responses, and adrenal function.

Endocrine Agents

Glucocorticoids/ corticosteroids-IF STOPPED ABRUPTLY

**Addison's disease (adrenal glands dont produce certain hormones)** Endocrine Agents

Glucocorticoids/ corticosteroids- TREATS

Rheumatoid arthritis, ulcerative colitis, asthma, and Crone's disease

## **Tuberculosis**

Caused by bacterium called "mycobacterium tuberculosis" attacks lungs, can be fatal if not treated. 2 types: latent TB and TB disease

### **Latent TB**

Lives in body without making you sick. Most people have this form. Breathed in and body fights off infection and stops bacteria from growing. No symptoms and not infectious, cannot spread to others.

### **TB disease (ACTIVE TB)**

Bacteria becomes active if immune system cannot keep bacteria from growing. People become physically sick and can spread this bacteria.

How do you prevent drug resistance?

### **MULTI DRUG THERAPY**

#### **Gold standard**

Rifampin

~Antimycobacterial~

Taken daily for several months with NO BREAK. (Breaks cause DRUG RESISTANCE)

-can stain body fluids orange

- can cause hepatotoxicity

- take on empty stomach ( or absorption is reduced by 30% and can cause DRUG RESISTANCE)

Isoniazid (INH)

~Antimycobacterial~

#### **BLACK BOX WARNING: hepatotoxicity**

-drug to drug reaction>acetaminophen think liver damage!

- drug of choice with pregnant women

- treats latent and active TB

- cause peripheral neuropathy in patients with vitamin B6 deficiency (Malnourished)

#### **Ethambutol**

~Antimycobacterial~

-can cause vision problems ( Optus neuritis, and red-green color blindness )

- can take while breastfeeding

#### **Pyrazinamide**

~Antimycobacterial~

- given in first months of Combo therapy to reduce total length of treatment by months

- can cause ARTHRALGIA (joint pain) peripheral neuropathy and hepatotoxicity ( not associated with B6 deficiency)

TB vaccine

LIVE VACCINE

Bacille Calmette-Guérin (BCG)

- WHO recommends infants in countries with high TB rates get this vaccine shortly after birth
- NO PREGNANT WOMEN
- NO IMMUNE COMPROMISED

### **Fungal infections**

- topical or systemic (SYSTEMIC = LIFE THREATENING)
- opportunistic or non- opportunistic
- mild > life threatening
- can be caused by antibiotics or steroids

Thrush

Fungal infection of the mouth including mucous membranes

Nystatin

~antifungals~

### **MYCOSTATIN**

ACTION : bind to fungal cell membrane, causes cell content to leak out = cell death

USE : topical treatments, not absorbed in GI system, safe for oral administration

- SWISH & SWALLOW

Fluconazole (Diflucan)

Treat: candida (YEAST)

And cryptococcal meningitis

Pregnancy category C (caution)

### **Bacitracin**

Peptide antibiotics

OTC availability

Effective for gram positive and some gram negative bacteria

Ointment for skin

### **Metronidazole (flagyl)**

- impaired DNA function of susceptible bacteria

- primary use: treat organisms in GI tract and treat bacterial vaginosis

PREVENT DISULFIRAM REACTION: avoid alcohol during and 48 hours after treatment

DISULFIRAM reaction

Facial flush Severe headache Slurred speech

Abdominal cramping

Tachycardia

Palpitations

Hypotension

Dyspnea

Sweating

Nausea

Vomiting

VIRUSES

Must reside in living cell to replicate

> uses own DNA or RNA to generate new viruses within host cell

## **bully cells to make more of their DNA & RNA**

>>Wipes out immune system!

## **INFLUENZA**

> an ounce of prevention (VACCINE) is better than a pound of cure (no cure) <

Mutate quickly and often

~Potential for major pandemic is constant threat!

PANDEMIC of 1918: 30-50 million killed from influenza virus!

### Osteltamivir(tamiflu)

Shortens course of flu symptoms by 2 to 3 days only if given within 48 hours of onset of symptoms

>> children and teenagers with the flu may be at higher risk for seizures, confusion, or abnormal behavior early during their illness

### **Acyclovir (Zovirax)**

Effective against herpes virus

Life threatening side effects:

neuropathy

Seizures

Nephrotoxicity(large doses)

Thrombocytopenia

Leukopenia

## **Helminths**

-Parasitic worms that feed on host tissues

-Most common in intestines

•Flukes

•Round worms

•Hook worms

•Pin worms

~ Can be acquired from poor hand washing, lack of access to clean drinking water, or eating undercooked pork

### Anti helmintic drugs

Can cause GI distress, neurologic problems and liver disease

~ Cysticercosis: cysts on the brain caused by larval tapeworms

## **Malaria**

Caused by protozoan parasite " Plasmodium " carried by infected mosquitos

- once human is infected 2 phases occur:

>tissue phase- no symptoms

> erythrocytic phase- (invasion of red blood cells) causing chills, fever, sweating

Over 1 million people die from malaria each year 90% in sub Saharan Africa

Chloroquine

### **~Antimalarial~**

Serious adverse reactions:

ECG changes

Hypotension

Psychosis

Seizures

Antineoplastic agents

Cancer drugs

Cancer

Malignant neoplasm cells are characterized by unregulated growth, lack of differentiation and spread( metastasis) to other places in body.

>> BODY GOING HAYWIRE<<

### **Chemotherapy**

>>use of chemicals to kill cancer cells by inhibiting or preventing cell reproduction

Classes of chemotherapy drugs

Alkylating agents

Antimetabolites

Antitumor agents

Mitotic agents

Hormonal agents

Antimetabolites

Folic acid antagonist

Methotrexate (trexall)

~Antimetabolite~

- treat cancer

- rheumatoid arthritis

-psoriasis

-induce miscarriage in patients with ectopic pregnancy

>>SIDE EFFECT: bone marrow suppression CHECK CBC WBC PH (leads to leukopenia, thrombocytopenia, anemia)

-stomatitis

-vomiting

-alopecia

-hepatic and renal dysfunction

>> patients should report signs of bleeding and have platelets checked

Cyclophosphamide (cytoxan)

~Alkylating drugs~

Treat Hodgkin's disease and other cancers

>>Can cause HEMORRHAGIC CYSTITIS (result of severe bladder inflammation

>>TAKE WITH LARGE AMOUNT OF WATER IN AM<<

Erythropoietin (Epoetin Alpha)

~ biologic response modifier~

>>stimulates red blood cell production

- ↑ risk of death when patients Hgb is >12  
THINK > BIKE RIDERS  
^^ RBC ^^ O<sub>2</sub>

What vaccine is not an attenuated live vaccine?

Hepatitis B  
Tetanus

Which form of the influenza vaccine would be contraindicated in for a patient above the age of 55?

Nasal spray vaccine

Is it possible to die from chicken pox (varicella)

YES

Attaining viral suppression of HIV necessitates the use of at least 2 and preferably 3 active drugs from \_\_\_ or more classes.

2 or more classes

How many people were estimated to have died in the influenza pandemic of 1918-1919?

30-50 million

A normal CD4 T-helper cell count is?

>500 cells/mm (cubed)

In order to prevent injury to the eye, anesthetic eye drops should only be administered under what conditions?

With strict MEDICAL supervision

Latanoprost (Xalatan) eye drops are used to decrease intra-ocular pressure in glaucoma patients.

Potential side effects of the medication include:

- >Permanent darkening of the iris of the eye
- > increase in length, number, darkness and thickness of eyelashes
- >respiratory problems

Oral decongestants and antihistamines have been shown to have what benefit in treating disorders of the ears.

NO

The use of Silver Sulfadiazine (SSD) cream for burns should not be used where due to the risk of permanent dyeing (tattooing) ok skin?

Face and hands

Isotretinoin(Amnesteem, Accutane) a medication used to treat severe cystic acne is what pregnancy category?

X

What percentage of the world is infected with TB

25%

Your patient is starting a medication regimen for TB. You tell him that his bodily secretions may be stained orange by which medication?

Rifampin

You are treating a patient who is a guard in the county jail, she is currently being treated for TB infection acquired on the job. She tells you she has no energy for cooking and eats mostly packaged and easily prepared meals. She reports pain and tingling in her extremities. You suspect she has what vitamin deficiency?

B6

You know your patient needs further teaching about her child's thrush when she states:

If my child swallows the medication, I need to call poison control

How many people (mostly children) die in sub Saharan Africa each year?

One million

A DISULFIRAM REACTION most commonly occurs with which 2 types of medications?

Flagyl metronidazole)

Cephalosporins

Patient on methotrexate reports that she has numerous large bruises on her legs what action should you take?

>ask about recent trauma

> Report bruising to her prescribing physician

> Anticipate an order for a lab draw to check platelets

Cyclophosphamide (cytoxan) an alkalyzing agent can cause hemorrhagic inflammation of which organ?

Bladder

To prevent this serious side effect the patient should be encouraged to take cyclophosphamide when ?

AM with LARGE AMOUNT OF WATER

Fluroquinolone antibiotics (ciprofloxacin or cipro) can result in what connective tissue complication with steroids?

TENDON RUPTURE

Ciprofloxacin should not be taken with products containing the following

Antacid, Aluminum , Iron, Zinc

Tetracycline antibiotics are associated with which of the following?

>Take on empty stomach (milk and antacids can prevent absorption)

>Can stain teeth of fetus or young children

>Can decrease effectiveness of oral contraceptives

> Can result in photosensitivity reactions

If a patient has a mild allergic reaction such as mild itching or minimal hives to an antibiotic they may be treated with an antihistamine (which might cause drowsiness) such as?  
Diphenhydramine ( Benadryl)

A well informed nurse knows that patients with a SULFA allergy may be at increased for allergies to which of the following medications  
Glucotrol  
Celecoxib  
Furosemide

Peak and trough levels are ordered on the glycoproteins antibiotic Vancomycin in order to ensure safety, efficacy and Metabolism and elimination

If a patient is experiencing anaphylaxis the nurse must always be most concerned with the patients what?  
Airway

A macro life antibiotic that is excreted primarily in the bile of the liver making it a good choice for renal impairment is:  
Erythromycin

Medical term for bladder infection  
Cystitis

Medical term for kidney infection  
Pyelonephritis

Tolterodine tartrate (detail, detail LA) is contraindicated in which of the following conditions?  
Bowel obstruction

Nurse is caring for a patient who complains of urinary urgency and frequency and burning with urination, you anticipate she will be prescribed an antibiotic. What other medication will you suggest to the provider?  
Phenazopyridine (pyridium) a bladder analgesic

The first agent used against bacterial infections, derived from coal tar  
Sulfonamides

What percentage are Sulfonamides effective against E. Coli bacteria  
90% this makes them a good choice for UTI treatment  
Because of the decrease of clinical usefulness over time how are sulfonamides frequently given?  
In combination with other drugs  
Human Immunodeficiency Virus (HIV)

~RNA Retrovirus~

Uses reverse transcriptase to transfer their RNA to DNA in the cell.

- destroys CD4+ T helper lymphocyte cells causing immune deficiency and can be fatal

## HIV Treatment

~Antiretroviral Therapy~

To create viral suppression of HIV the use of 2-3 drugs from different drug classes is needed.

Zidovudine (AZT, Retrovir)

Nucleoside reverse transcriptase inhibitors

Tenofovir (Viread)

Nucleotide reverse transcriptase inhibitors

Efavirenz ( Sustiva)

Nucleotide reverse transcriptase inhibitors

Atazanavir (Reyataz)

Protease inhibitor

HIV lab testing

CD4 T- cell count is monitored when determining when to initiate medication, effectiveness, and indications for changing therapy

Acquired immunity

Immune response is activated when a pathogen invades the body, the body recognizes this pathogen as foreign and begins to produce antibodies

## Influenza

>>AN OUNCE OF PREVENTION (VACCINE) IS BETTER THAN A POUND OF CURE

( there is none)

~Influenza virus mutates quickly and often

~ potential for a major pandemic is a constant threat

Influenza vaccine Contraindications

Currently ill

Egg or flu vaccine allergy

Under 2 or over 49 years old

Immune suppression or live with someone who is

Pregnant

Ever had guillain- barre syndrome

Age 2-17 and taking aspirin

Attenuated (Live) vaccine

BCG (tuberculosis)

MMR (measles, mumps, rubella)

Varicella (chicken pox)

Not Live ( inactivated)

Hep B (hepatitis B)

Tetanus Toxoid

Varicella (Varivax)

For prophylaxis for outbreak control of local epidemics.

Adverse Reactions:

Anaphylaxis

Thrombocytopenia  
Encephalitis  
Stevens- Johnson syndrome  
Drugs for disorders of the eye

- Diagnostic stains
- Topical anesthetic
- Anti infectives
- Anti- inflammatory
- Decongestants
- Lubricants
- Immunosuppressants
- Anti- Glacoma Agents

#### Topical Anesthetics

- not for self administration
- GOVERN ONLY UNDER STRICT SUPERVISION
- numbing of the eye could lead to serious injury of the eye by trauma, without the patient being aware of it

#### Glacoma

Optic nerve damage occurs as a result of increased intraocular pressure( IOP) due to a build up of the fluid, aqueous humor.

- open angle
- narrow angle

#### Open angle Glacoma

Trabecular network becomes gradually clogged

#### Narrow Angle

The iris bows and blocks the trabecular mesh work, narrowing the angle where the fluid normally exits the eye (often requires surgery)

#### Glaucoma treatment

- Prostaglandin Analogues
- Beta- Adrenergic Blockers
- Cholinergic Agents
- Alpha Adrenergic Agonists
- Carbonic Anhydrase Inhibitors
- Osmotics

Lantoprost (Xalatan)

~ Prostaglandin Analogues~

\*\* DECREASES IOP by INCREASING outflow

>> SIDE EFFECTS: permanent darkening of the iris

^ in length, number, darkness, and thickness of lashes

>> ADVERSE EFFECTS: up to 4% of patients report respiratory problems

HOLD TEAR DUCT SO MEDICATION DOES NOT GO INTO SYSTEMIC CIRCULATION

Acute Otitis Media

## MOST COMMON IN CHILDREN

First choice of treatment?? AMOXICILLIN (po)

Acute Otitis Externa

SWIMMERS EAR

- Infection of the external auditory canal, when moisture is present with a break in skin allowing bacterial or fungal invasion.

Treatment?? Topical drops

Cerumen Impaction

~ Ceruminolytics ~

topical agents used to soften ear wax

usually use mineral oil with hydrogen peroxide

~ Irrigation ~

body temperature water gently flush into ear canal

can use 3% hydrogen peroxide 1:1 with water

or

vinegar 1:1 with water

Acne Vulgaris

~ non pharmacological ~

- control stress, and diet, gentle cleansing

~ Topical ~

>keratolytics

benzoyl peroxide, salicylic acid, resorcinol, tretinoion

~ Systemic ~

oral antibiotics ( tetracycline, doxycycline)

Isotretinoin (Amnesteem Accutane)

TREATS SEVERE CYSTIC ACNE

-decreases sebum formation, anti inflammatory, antikeratinizing

PREGNANCY CATEGORY X!!!!!

REQUIRES : registry of patient, provider, pharmacist, and wholesaler for use of this medication, on IPLEDGE registry

Psoriasis

- Erythematous papules (bumps) and Red plaques covered with silvery scales

-Epidermal cell growth and turnover and accelerated to 5 times normal expected growth.

>> REMISSION AND EXACERBATION

~ TOPICAL ~

-kertolytics

-glucocorticoids

-coal tar derivatives

~ Systemic ~

- methotrexate (anticancer drug, can decrease cell growth)

-UV light therapy

- Biologic agents>> Immune Supression

Burns

~MINOR~

treat with cool water compresses

antibiotic ointment once cooled

~PARTIAL & FULL THICKNESS~

Intensive treatments

**\*SKIN BREAK = POSSIBLE INFECTION\***

Silver Sulfadiazine (SSD) -prevent infection

works on cell wall to produce bactericidal effect

DO NOT use on the FACE or HAND, causes "tattooing" (permanent staining)

Bacteria

Single celled organism lacking a true nucleus or nuclear membrane

- Some release toxins when cell is dying

- Gram - CAN'T hold stain

- Gram + CAN hold stain

Bacteriostatic

SLOWS down bacteria

Bactericidal

KILLS bacteria

5 mechanisms of action --> ANTIBIOTICS

> Inhibition of bacterial cell wall synthesis

> Alteration of membrane permeability

> Inhibition of protein synthesis

> Inhibition of the synthesis of RNA & DNA

> Interference with metabolism within the cell

What do antibiotics do?

work with your immune system to subdue the invading micro – organism

Narrow Spectrum Antibiotics

primarily effective against one organism

Broad Spectrum Antibiotics

FIRST GET ALL CULTURES NEEDED

THEN START BROAD SPECTRUM ANTIBIOTICS

Can be effective against:

Gram -

Gram +

> Often used when the organism causing the infection has not been identified

example - Sepsis

SEPSIS

^ Heart rate

^ Respirations

^ Temperature

^ WBC

decrease Blood Pressure

Adverse Reactions to Antibiotics

Allergy or hypersensitivity

- mild to fatal ( anaphylaxis)

> itching & hives >> angioedema

Superinfection

- secondary infection that occurs when normal microbial flora of body is disturbed

> often fungal

> more common in broad spectrum antibiotics

> Example = CDIFF

Organ Toxicity

- hepatotoxic

- nephrotoxic

- ototoxic

## ANAPHYLAXIS

\* THINK AIRWAY \*

Skin flush, hives, itchy, >> angioedema (swelling of face, throat, mouth)

TREAT with:

> EPINEPHRINE

> BENADRYL

> STEROID

Amoxicillin

~ PENICILLIN ~

BROAD SPECTRUM

primary:

> respiratory tract

> otitis media

> sinusitis

CONTRAINDICATED:

Penicillin Allergy

Caution:

cephalosporin allergies

amoxicillin / clavulanic acid (Augmentin)

~ Beta Lactamase Inhibitor ~

combined with broad spectrum antibiotic

RESULT > extended microbial effect

>>> Beta- Lactamase: an enzyme produced by some bacteria that make them resistant to penicillin

Ceftriaxone ( Rocephin)

Cephalexin (Keflex)

~ CEPHALOSPORINS ~

active against:

GRAM -

GRAM +

resistant to beta lactamase

CAUTION:

patients with penicillin allergy

DISULFIRAM REACTION IF MIXED WITH ALCOHOL

Azithromycin (Zpak)

~ MACROLIDES ~

Treats:

respiratory tract, sinus, GI tract, skin and soft tissue infections ( impetigo) and Sexually transmitted infections (STIs)

Life Threatening:

hepatotoxicity, anaphylaxis, Stevens - Johnson syndrome

Erythromycin

~MACROLIDES ~

Frequently prescribed if patient has PCN allergy

allergic reactions are rare

>> Excreted primarily in the bile by the liver, GOOD CHOICE FOR RENAL IMPAIRMENT PATIENTS

Vancomycin

~GLYCOPEPTIDE ~

Treats:

drug resistant staphylococcus aureus

MRSA

>> OTOTOXICITY can lead to permanent hearing loss by damaging cranial nerve VIII (8)

>> Too rapid administration can lead to Red Man Syndrome if this occurs NOTIFY MD and DECREASE DOSE IF NEEDED

PEAK & TROUGH

must be checked to ensure safety and efficacy ( metabolism & elimination )

Tetracycline

~ TETRACYCLINE ~

\*\* Take on EMPTY STOMACH

\*\* NO MILK OR ANTACIDS ( decrease absorption)

Can stain teeth of fetus or young children

can decrease effectiveness of oral contraceptive

photosensitivity

Doxycycline

~ TETRACYCLINE ~

\*\* Take WITH FOOD ( enhances absorption)

>> AVOID MILK and DAIRY

contraindicated if pregnant (USE BARRIER CONTRACEPTIVES)

common side effects:

N/V, diarrhea

Gentamicin

~ AMINOGLYCOSIDE ~

Treats:

serious infections

Can cause:

nephrotoxicity

Ototoxicity

**ASSESS:**

hearing, balance and urine output while on therapy

ciprofloxacin (Cipro)

~ FLUROQUINOLONES ~

**\*SHOULD NOT BE FIRST CHOICE\***

Broad Spectrum

Treats:

UTI, Lower Resp., skin & soft tissue and bone infections, also anthrax

> ADMINISTER:

empty stomach

magnesium, aluminum, Iron or zinc should be taken 4 hours before or 2 hours after cipro

>> DO NOT TAKE WITH ANTACIDS

>> CAN CAUSE TENDON RUPTURE IF TAKEN WITH STEROIDS<<

Levofloxacin (Levaquin)

~ FLUROQUINOLONES ~

Primary treat:

Resp inf. > pneumonia, chronic bronchitis,

acute sinusitis

UTI and uncomplicated skin inf.

>> CAN CAUSE TENDON RUPTURE WHEN TAKING WITH STEROIDS<<

Sulfonamides

FIRST agent used against bacteria

90% effective against E. Coli

Drug allergies:

if patient reports>>

ask more information about past reactions

IF TRUE ALLERGY they can be allergic to the following also:

glucotrol (Glipizide)

Celecoxib (Celebrex)

Furosemide (Lasix)

trimethoprim - sulfamethoxazole (Bactrim)

~ SULFONAMIDES ~

Treat:

UTI, Otitis media, bronchitis

PHOTO SENSITIVITY: avoid sun exposure, wear sunscreen and protective clothing

Should be avoided in THIRD TRIMESTER

^^ FLUID INTAKE

Urinary Tract Infection (UTI)

UPPER

> Pyelonephritis (Kidney)

- symptoms: fever, chills, flank pain(severe)

## LOWER

- > Cystitis (bladder)
  - more common in females due to shorter urethra,
  - frequently --> E. Coli

## > Urethritis

## > Prostatis

### ANTIBIOTIC TREATMENT OPTIONS:

- nitrofurantoin (macrobid)
- trimethoprim/sulfamethox (b atrim)
- fluroquinolones (cipro)
- norfloxacin

nitrofurantoin (Macrobid, Macrodantin)

Bacteriostatic or cidal depending on dose

Treats:

acute or chronic UTI

### TAKEN WITH FOOD

Decreased absorption with taken with antacids.

phenazopyridine (Pyridum)

### URINARY ANALGESIC

DOES NOT TREAT INFECTION

>> Turns urine ORANGE can stain clothing.

can alter glucose test

### TAKE WITH FOOD TO AVOID NAUSEA

Urinary Antispasmodics / Antimuscarinics

Treats:

Urinary tract spasms associated with injury or infection

### CONTRAINdICATED:

urinary or GI obstruction is present

CANT SEE

CANT PEE

CANT SPIT

CANT POOP

tolterodine tertrate (Detrol, Detrol LA)

>>CHOLONERGIC RECEPTOR BLOCKER (anticholinergic)<<

-decreases urinary frequency and urgency

-monitor for anticholinergic side effects