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| **Perfusion and Renal Elimination 6.6** | | | | | |
| **Class: Antiarrhythmic**  **Prototypes: Amiodarone**  **Mechanism:** Acts on myocardial depolarization and also repolarization. It blocks potassium, sodium and calcium channels as well as beta and alpha adrenergic receptors. Effects on electrical signals of the heart | | | **Therapeutic Effects:**   * Treatment of life threatening Ventricular Arrhythmias and Atrial fibrillation * Restores normal heart rhythms to regular beats | | |
| **Administration** | **Indications** | **Contraindications** | | **Side Effects** | **Nursing Considerations** |
| * Given PO and administered twice a day at regular times. * Can be given IV in the hospital setting. Run as a slow infusion for short term treatment 24hrs | * Life threatening ventricular arrhythmias * Uncontrolled atrial fibrillation | * Use cautiously with geriatric population with diminished hepatic, renal or cardiac function * Drug interactions such as Digoxin, Warfarin, Simvastatin, Sildenafil, Cyclosporine, Quinidine, and propafenone, Quinolones and Antidepressants | | **Allergic reactions:**   * skin rash * itching * hives * swelling of your lips, face, or tongue   **Lung problems**:   * wheezing * trouble breathing * shortness of breath * coughing * chest pain * spitting up blood   **Vision changes**:   * blurred vision * increased sensitivity to light * vision problems such as seeing blue or green halos (circles around objects)   **Liver problems**:   * unusual tiredness or weakness * dark urine * yellowing of your skin or the whites of your eyes   **Heart problems**:   * chest pain * fast or irregular heart rate * feeling lightheaded or faint * unexplained weight loss or weight gain   **Stomach problems**:   * spitting up blood * stomach pain * nausea or vomiting   **Thyroid problems**:   * decreased tolerance to heat or cold * increased sweating * weakness * weight loss or weight gain * thinning hair   **Nerve damage**:   * pain, tingling, or numbness in your hands or feet * muscle weakness * uncontrolled movements * trouble walking   **Serious skin reactions**:   * blue-gray skin color * severe sunburn * **SAFETY:** Can have fatal toxicities and multiple drug interactions | Remind to use sunblock to prevent sun burns  Prepare person for skin coloration risks  Avoid drinking or eating grapefruit juice as it interacts  Monitor Blood pressure and Heart rate (risk of heart blocks) |

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| **Perfusion and Renal Elimination 6.7** | | | | | |
| **Class: Cardiac Glycosides**  **Prototypes: Digoxin**  **Mechanism:** Digoxin works by inhibiting the sodium and potassium pump, which results in an increase in intracellular sodium and an influx of calcium into cardiac cells, causing the cardiac muscle fibers to contract more efficiently and increase cardiac output | | | **Therapeutic Effects:**   * Increased pumping action increases in improved cardiac output | | |
| **Administration** | **Indications** | **Contraindications** | | **Side Effects** | **Nursing Considerations** |
| * Typically given PO without food once a day in the morning * Take within 2hrs pre or post eating high fiber foods for best absorption * Take Antacids, metoclopramide as far from digoxin as possible | * Heart failure * Irregular heartbeat such as chronic atrial fibrillation | * Kidney or hyper or hypo thyroid problems * Avoid alcohol or driving machinery if this drug causes dizziness for the person * Pregnancy-must talk with MD to take or not to take but it is possible * It does cross into breast milk but no reported harm- talk with MD * St Johns Wort, antifungals and some antibiotics can affect the removal of digoxin in the body | | Digoxin toxicity; early signs include nausea, vomiting, and diarrhea  Bradycardia and arrhythmias  Headache, weakness, dizziness, and mental changes such as anxiety or hallucinations  Gynecomastia (with prolonged use)   * **SAFETY:**   Geriatrics have increased risk of toxicity-Digibind is used to treat toxicity | * Apical pulse check for full 1 minute before administration * Monitor serum digoxin levels for toxicity and potassium blood levels * Monitor for blood pressure * Signs and symptoms of heart failure and overload including urine output and respiratory assessment |

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| **Perfusion and Renal Elimination 6.8** | | | | | |
| **Class: Antianginals**  **Prototypes: Nitroglycerin**  **Mechanism:** Nitroglycerin relieves angina by relaxing vascular smooth muscle, resulting in vasodilation | | | **Therapeutic Effects:**   * Increases blood flow to the heart with vasodilation specifically coronary arteries and veins * Decreases the oxygen demand by the heart | | |
| **Administration** | **Indications** | **Contraindications** | | **Side Effects** | **Nursing Considerations** |
| * Routes S/L pill or spray, extended release tablets, creams, transdermal patches, and IV * Nitro decomposes in heat or light so store in original airtight glass container | * Angina related to CAD * Removes hypoxia of cardiac tissue | * If taking Viagra for erectile dysfunction hold nitro as it might drop BP too low * Pregnant and breast feeding woman cannot use * Severe anemia, increased Intracranial Pressure, hypersensitivity or circulatory failure are all contraindications | | * Hypotension * Palpitations * Headache * Weakness * Sweating * Flushing * Nausea and vomiting * Dizziness * **SAFETY:**   Monitor Blood pressure regularly  If using transdermal patch, make sure to date and note the area it is placed-typically chest or arm and rotate sites. Avoid touching medication side of patch this will cause you to be dizzy and possibly faint as a nurse wear gloves | * Nitro sprays are used as PRN for chest pain. 1 spray every 5 minutes x 3. If the chest pain is not relieved after first dose then call 911 * Can use prophylactically before exercise if needed * Make sure if using Sublingual (S/L) pill that it dissolves under the tongue * Sit during administration in case of drop in BP |

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| **Perfusion and Renal Elimination 6.9** | | | | | |
| **Class: Loop Diuretics**  **Prototypes: Furosemide (Lasix)**  **Mechanism:** Loop diuretics inhibit absorption of sodium and chloride in the loop of henle and proximal and distal tubules, thus causing fluid loss, along with sodium, potassium, calcium, and magnesium losses. Loop diuretics are very potent diuretics and are used when a patient has an exacerbation of fluid overload. | | | **Therapeutic Effects:**   * Decrease fluid load * Decrease Blood Pressure (hypertension) * Increase urine output to remove fluid * Improve lung edema improve oxygenation-gas exchange capacity and ventilation | | |
| **Administration** | **Indications** | **Contraindications** | | **Side Effects** | **Nursing Considerations** |
| * PO/IV * Ototoxicity can occur if administered too fast IV. Make sure to follow specifically hospital protocols * Check BP before administering risk of orthostatic BP so do it standing and sitting * Weight gain of more than 3 pounds in one day needs to be reported. Track weight daily * Avoid taking medication 4 hrs before bedtime to prevent having to get up to urinate * Dosage is dependent on condition and for children it is weight based. * Usually starting dose is low and increased as wneeded * Take regularly if ordered | * Pulmonary Edema * Hypertension * Peripheral edema * Heart failure * Kidney, heart or liver caused edema | * Scralfate, cholestyramine, and colestipol decrease absorption of Lasix * If condition does not improve-report to prescribing MD | | * Dehydration * Low Blood pressure * Electrolyte depletion especially potassium * Ototoxicity * Renal impairment * Dizzyness * Light headedness * Blurred vision * Muscle cramps * Fainting * Dry mouth or thirst * Unusual tiredness * Fast or irregular heart beat * Sensitive to sun avoid sun lamps or tanning * **SAFETY:** if diabetic-blood sugars could be impacted make sure to check these levels   If diarrhea or vomiting-increase risk in dehydration follow MD instructions on fluid during this time | * Potassium serum levels * Renal function serum blood levels * Assess blood pressure on administering medication * Weigh patient to track hydration and volume status * Strict Intake and output charts of volume status * Promote potassium rich food like bananas * Daily weights |

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| **Perfusion and Renal Elimination 6.10** | | | | | |
| **Class: Antihypertensives-** Beta 1 Antagonist also called beta blockers  **Prototypes: Metoprolol**  **Mechanism:** Metoprolol primarily blocks Beta-1 receptors in the heart, causing decreased heart rate and decreased blood pressure. However, in higher doses can also block Beta-2 receptors in the lungs, causing bronchoconstriction | | | **Therapeutic Effects:**   * Decrease workload of heart * Decreases blood pressure * Decreases Heart Rate | | |
| **Administration** | **Indications** | **Contraindications** | | **Side Effects** | **Nursing Considerations** |
| * Do not crush medications * Assess heart rate and hold medication if HR is less than 60 beats per minute * Monitor blood pressure daily report abnormal BP and HR to MD * Take as ordered at the same time every day | * High blood pressure * Chest pain in people with poor blood flow to heart * Tachycardia and rapid arrhythmias * Early intervention for myocardial infarction to decrease workload of heart | * Asthma or respiratory diseases can be affected with the higher dose when beta 2 is stimulated resulting in cough | | * Fatigue * Dizziness * Depression * Insomnia * Nightmares * GI upset * Erectile dysfunction * Dyspnea * Wheezing * Cold sensitivity * **SAFETY:**   When tapering dosage make sure to do it slowly over a few weeks, abrupt drop can cause chest pain and MI | * Commonly masks hypoglycemia so check diabetic blood sugars regularly |

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| **Perfusion and Renal Elimination 6.11** | | | | | |
| **Class: Antilipemics**  **Prototypes: Atorvastatin (Lipitor)**  **Mechanism:** Atorvastatin inhibits HMG-CoA reductase and cholesterol synthesis, which reduces LDL (low density lipoprotein) | | | **Therapeutic Effects:**   * Decreases Lipid levels LDL’s * Improves blood flow through blood vessels by reducing cholesterol synthesis | | |
| **Administration** | **Indications** | **Contraindications** | | **Side Effects** | **Nursing Considerations** |
| * Administered PO 10-80 mg daily (dose depends on prescribing MD) * Increasing doses happen every 2-4 weeks until therapeutic lipid blood levels * Do not stop taking unless advised by doctor * Keep away from children and moisture (avoid bathroom storage) | * Hyperlipidemia * Prevention of Cardiac disease * Prevention of Stroke * Reduce risk post revascularization procedures | * People with Hepatic disease * Pregnant or breast feeding * Children under 10 years of age (make sure to check guidelines in you setting * Cyclosporine * Gemfibrozil * Red yeast rice | | * Nausea and diarrhea * Dyspepsia * Increased blood glucose * Rhabdomyolysis- kidney damage resulting so watch for kidney function * Myalgia * Muscle pain and weakness * Tea colored urine * Irregular heart beat * **SAFETY:**   Report muscle pain, yellow skin, decrease in urine and abdominal pain to MD-serious complications can arise | * Caution in giving to geriatric patient due to increased risk for myopathy * Assess routine liver and kidney function tests and Hb1AC increases possible with statins * Do not drink or eat grapefruit |

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| **Perfusion and Renal Elimination 6.12** | | | | | |
| **Class: Blood Coagulation Modifiers (Antiplatelet)**  **Prototypes: Acetylsalicylic acid (Aspirin) and Clopidogrel (Plavix) Two common ones used in Cardiac patients**  **Mechanism:** ASAinhibits platelet activation and aggregation. Plavix is metabolized to its active metabolite by CYP2C19. Concomitant use of drugs that inhibit the activity of this enzyme results in reduced plasma concentrations of the active metabolite of Plavix and a reduction in platelet inhibition | | | **Therapeutic Effects:**   * Inhibits platelet development and stickiness * Plavix also acts on enzyme to reduce plasma concentrations to increase reduction of platelets * Allow blood flow through blood vessels * Prevents platelets from sticking and blocking areas within the blood vessel to keep open blood flow and oxygenation to occur | | |
| **Administration** | **Indications** | **Contraindications** | | **Side Effects** | **Nursing Considerations** |
| * PO pills given-dose depends on patient and medical reason as per MD * Administer with food to avoid upset and bleeding GI * Monitor for signs of bleeding or bruising * Overdose is irreversible * Avoid eating or drinking grapefruit juice | * MI * Stroke * Acute Coronary Syndrome (ACS) * Post angioplasty and stent insertion * Unstable Angina | * Children under 12 can get flu like symptoms due to risk of Reye’s Syndrome * Avoid alcohol to prevent gastric irritation and GI bleed * Avoid NSAIDS | | * Tinnitus * Unusual bleeding of gums * Bruising * Blood in stool * **SAFETY:**   Bleeding risk  Note that some MD prescribe Plavix and ASA at the same time  **Contact 911** if sudden vision changes, confusion, weakness, arm pain or sweating, trouble speaking | * If person needs surgery must hold these drugs for 7- 10 days (life of a platelet) to prevent bleeding in surgery * Monitor for signs and symptoms of bleeding including heart rate elevation, low urine output and hypotension * Check abdomen for signs of bruising or bleeding/enlargement and turn patient to side to assess peritoneal area for bleeding/bruising |