

# PARAMEDIC PHARMACOLGY III

Seminole Community College  
Paramedic Program

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## Activated Charcoal (Actidose, Sorbitol)

- **Class:** Absorbent
- **Actions:** Prepared charcoal that has a surface that will bind toxins, not allowing for absorption.
- **Indications:** Poisoning after emesis or when emesis is contraindicated.
- **Dosage:** 20 – 30 gm in 240 ml water in a slurry solution, either orally or through a nasogastric tube.

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## Activated Charcoal (Actidose, Sorbitol)

- **Precautions:** Do not use with Ipecac, altered level of consciousness.
- **Contraindications:** should not be used for cyanide, mineral acids, caustic alkalis, organic solvents, iron, ethanol, and methanol.
- **Adverse effects:** Vomiting following rapid administration.

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## ALBUTEROL (Proventil, Ventolin)

- **Class:** Bronchodilator (Synthetic Sympathomimetic with less cardiac effect than Epinephrine). Duration 4 hours.
- **Actions:** Causes bronchodilation, with reduced effect on heart rate and cardiac output. Inhibits histamine release thereby reducing mucus production.
- **Indications:** Acute Bronchial asthma, COPD with bronchospasm, CHF, Pulmonary edema, Allergic reactions.

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## **ALBUTEROL (Proventil, Ventolin)**

- **Dosage:** Adult 2.5 mg/3.0 ml updraft.  
Child dose: 0.15 mg/kg in 3.0 ml.
- **Precautions:** ECG changes, hypotension, if PSVT occurs a larger dose of Adenosine may be necessary.  
Hypersensitivity!
- **Side effects:** Tremors, anxiety, seizures.

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## **AMINOPHYLLINE (Somophyllin)**

- **Class:** Bronchodilator
- **Actions:** Prolongs the effects of beta agonists by blocking the enzyme that degrades them. Prolongs bronchodilation and a decrease in mucus production. Causes increased heart rate and cardiac output.
- **Indications:** Bronchial asthma, COPD with bronchospasm, CHF, Pulmonary edema.

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## **AMINOPHYLLINE (Somophyllin)**

- **Dosage:** 250 – 500 mg over 20 – 30 minutes. Pediatrics 6 mg/Kg over 20 – 30 minutes max 12mg/kg/24 hrs.
- **Precautions:** ECG changes, hypotension.
- **Contraindicated:** hypersensitivity to methylxanthines or uncontrolled dysrhythmias.

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## **AMYL NITRATE**

- **Class:** Nitrate Vasodilator
- **Actions:** Causes coronary vasodilation, Removes cyanide-ion via a complex mechanism.
- **Indication:** Cyanide Poisoning
- **Dosage:** 0.3 ml ampule, inhalant should be broken and inhaled, repeat until at ED.
- **Pediatric:** Same as for an adult. Inhalant should be broken & inhaled, repeat until at ED.
- **Contraindications:** none in emergency setting!

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## **ANISTROPLASE (Eminase)**

- **Class: Thrombolytic**
- **Actions: Dissolves blood clots**
- **Indications: Acute MI**
  - **Contraindications: Internal Bleeding, Aortic dissection, Traumatic CPR, Persistent hypertension, Head trauma or intracranial tumor, Hx of CVA in last 6 months, Pregnancy.**

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## **ASPIRIN (Acetylsalicylic Acid: ASA)**

- **Class: Thrombolytic**
- **Actions: Over the counter analgesic with thrombolytic properties.**
- **Indications: Chest Pain suggestive of an Acute Myocardial Infarction.**
- **Dosage: 160 – 325 mg chewed (Child version)**
- **Precautions: Hypersensitivity, active ulcer disease, may cause gastric distress and GI bleeding, not recommended for pediatric patients.**

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## **ATENOLOL (Tenormin)**

- **Class: Antidysrhythmic, antihypertensive**
- **Actions: beta<sub>1</sub> blocking agent**
- **Indications: Ventricular dysrhythmias, hypertension.**
- **Dosage: varies with prescription.**
- **Contraindicated: bradycardias and heart blocks.**

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## **BRETYLIUM TOSYLATE (Bretylol)**

- **Indications – no longer indicated for treatment of ventricular arrhythmias, due to the decrease in availability and it's documented ineffectiveness.**
- **Has been removed from all algorithms.**

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## **BUMETANIDE**

### **(Bumex)**

- **Class: Potent Loop Diuretic**
- **Actions: Inhibits reabsorption of sodium**  
**Slight vasodilation, 40 X greater than**  
**Furosemide.**
- **Indications: Congestive Heart Failure,**  
**Pulmonary Edema**
- **Contraindications: Pregnancy, Dehydration**
- **Dose: 0.5 – 1.0 mg IM/IV 1-2 minutes.**

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## **BUTORPHANOL**

### **(Stadol)**

- **Class: Synthetic Anagesic**
  - **Actions: Central Nervous System Depressant,**  
**Decreases sensitivity to pain, 2mg Stadol equal to**  
**10 mg Morphine**
- **Indications: Moderate to severe pain**
- **Dosage: IV 1 mg, or 3 – 4 mg IM. 2 mg**  
**(Naloxone should be available)**
- **Contraindications: Smaller doses for**  
**older adults, temperature/light sensitive.**

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## **CHLORPROMAZINE**

### **(Thorazine)**

- **Class: Major Tranquilizer, antipsychotic;**  
**phenothiazine.**
  - **Actions: Blocks dopamine receptors in the brain**  
**associated with mood and behavior.**
- **Indications: Acute psychotic episodes,**  
**Mild alcohol withdrawal, Intractable**  
**hicoughs, Nausea and Vomiting**
- **Precautions: May cause extrapyramidal**  
**reactions especially in children (use**  
**Benadryl).**

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## **Cimetidine (Tagamet)**

- **Class: Histamine Antagonist**
- **Mechanism of Action: Inhibits the action**  
**of histamine in the allergic reaction.**  
**Reduces gastric acid secretions.**
- **Indications: Allergic Reactions**
- **Contraindications: hypersensitivity**
- **Dosage: 300 mg, IVPB over 5 – 10**  
**minutes**

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## **DEXAMETHASONE (Decadron, Hexadrol)**

- **Class: Steroid**
- **Actions: Possibly decreases cerebral edema, Anti-inflammatory, suppresses immune response**
- **Indications: Cerebral edema, Asthma, COPD, Anaphylaxis (after epinephrine and Benadryl)**

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## **DEXTROSE 50%**

- **Class: Carbohydrate**
- **Actions: principle form of glucose used by the body for energy.**
- **Indications: increase blood sugar levels in hypoglycemia.**
- **Dose: 25 grams IV. Pediatric: 2 ml/kg of 25% solution.**
- **Precautions: Wernicke's encephalopathy, and Korsakoff's psychosis. Use 100 mg Thiamine.**

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## **DIAZEPAM (Valium)**

- **Class: Antianxiety agent, Anticonvulsant (Benzodiazapine)**
- **Actions: Smooth muscle relaxant that reduces tremors, and the incidence of seizures.**
- **Indications: Seizures, Status Epilepticus, premedication prior to cardioversion, Acute anxiety states.**
- **Dosage: 5 - 10 mg IV/IM, Pediatric 0.2 – 0.5 mg/kg IV or rectally. Onset 1 – 5 minutes.**
- **Precautions: CNS depressant and it's related symptoms. Antidote: Flumazenil (Romazicon)**

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## **DIAZOXIDE (Hyperstat)**

- **Class: Antihypertensive**
- **Actions: Decrease in both systolic and diastolic BP's, Direct peripheral arterial vasodilation.**
- **Indication: Hypertensive emergencies**

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## **DIGOXIN (Lanoxin)**

- **Class: Cardiac glycoside**
- **Action: Increases cardiac contractile force, Increase cardiac output**
  - **Reduces edema due to congestive heart failure, Slows AV conduction**
  - **Indications: Congestive heart failure, Rapid atrial dysrhythmias especially atrial fibrillation and atrial flutter.**

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## **DILTIAZEM (Cardizem)**

- **Class: Calcium Channel Blocker**
- **Actions: Slows conduction through the AV node and causes Vasodilation, decreases rate of ventricular response, Decreases myocardial oxygen demand.**
- **Indications: Rapid ventricular response in atrial fibrillation and flutter**
- **Dosage: 0.25 mg/kg IV over 2 minutes followed by 0.35 mg/kg.**
- **Contraindications: WPW, sick sinus syndrome, Heart blocks, Hypotension.**

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## **DIPHENHYDRAMINE (Benadryl)**

- **Class: Antihistamine**
- **Actions: Inhibits the release of histamine, thereby reducing bronchconstriction, and vasodilation. Primary treatment for urticaria.**
- **Indications: Allergic reaction and extrapyridamal effects**
- **Precautions: Hypotension, headache, drowsiness, seizure disorders, asthma.**
- **Dosage: 1 mg/kg up to 50 mg IVP (25-50mg)**

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## **Extrapyramidal Reactions**

- **Also known as Dystonic Reactions: a response to a drug marked by drooling, uncontrolled movements, changes in muscle tone, and abnormal posture.**
- **May be seen with the administration of certain antipsychotic agents such as Haldol, Thorazine, or Mellaril. May be also used for mediations that are used for nausea and vomiting, Phenergan, Compazine, Reglan.**
- **Benadryl will cause marked improvement or total resolution of the problem.**

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## **ESMOLOL (Brevibloc)**

- **Class:** Beta Blocker (B1 selective)
- **Action:** Decrease AV conduct. heart rate
- **Indications:** Symptomatic Supra - ventricular Tachycardia, including A-fib and Atrial Flutter. Has been used in cocaine overdose patients with SVT.
- **Contraindications:** Sinus bradycardia, heart blocks, CHF, Cardiogenic shock, Asthma.

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## **FLUMAZENIL (Romazicon, Mazicon)**

- **Class:** Benzodiazepine Antagonist
- **Action:** Reverses the effects of Benzodiazepines
- **Indications:** To reverse CNS respiratory depression
- **Contraindications:** Should not be used as a diagnostic agent like Narcan is used. “Potential for life-threatening withdrawal reactions is not worth the benefit.”
- **Dosage:** 0.2 mg IV over 15 seconds wait 45 seconds and repeat as needed maximum dose 1.0 mg

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## **GLUCAGON (GlucaGen)**

- **Class:** Hormone (antihypoglycemic agent)
- **Action:** Causes breakdown of glycogen to glucose, Inhibits glycogen synthesis, Elevates blood glucose level, Increases contractile force and heart rate. Will assist patients with food lodged in esophagus.

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## **GLUCAGON (GlucaGen)**

- **Dosage: Adult:** 1.0 mg IM may repeat every 5 – 20 minutes.
- **Pediatrics:** if over 55 lbs (25 Kg) 1 mg IM less than 55 lbs (25 kg) or younger than 6 – 8 years old administer ½ the dose (0.5 mg).
- **Beta Blocker overdose (50 – 150 mcg/kg IV), Ped 50 – 150 mcg/kg.**

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## **HALOPERIDOL**

### **(Haldol)**

- **Class:** Major Tranquilizer/Antipsychotic
- **Actions:** Blocks dopamine receptors in the brain associated with mood and behavior. Has antiemetic properties.
- **Indications:** Acute psychotic episodes.
- **Precautions:** May cause extrapyramidal reactions especially in children. Orthostatic hypotension.
- **Dosage:** 2 – 5 mg IM/IV

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## **HEPRIN SODIUM**

- **Class:** Anticoagulant
- **Actions:** Inactivates thrombin and prevents conversion of fibrinogen to fibrin.
- **Indications:** Prophylaxis and Treatment of Deep Vein Thrombosis, Myocardial Infarction, Pulmonary Embolism, Open Heart Surgery.
- **Precautions:** May cause hemorrhage.

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## **HYDROXYZINE**

### **(Vistaril)**

- **Class:** Antihistamine
- **Actions:** Antiemetic, Antihistamine, Antianxiety, Potentiates effects of narcotics and synthetic analgesics.
- **Indications:** Potentiates effects of narcotics and synthetic analgesics. Nausea and vomiting
- **Dosage:** 50 – 100 mg Deep IM, Ped dose 1mg/kg for acute anxiety attacks. Nausea and vomiting Adult 25 – 50 mg deep IM, Peds: 1 mg/kg deep IM.

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## **IPRATROPIUM BROMIDE**

### **(Atrovent)**

- **Class:** Anticholinergic, parasympatholytic chemically related to Atropine.
- **Actions:** Bronchodilation, reduces secretions of the respiratory tract, inhibits parasympathetic stimulation.
- **Indications:** Bronchial Asthma, reversible bronchospasm associated with chronic bronchitis or emphysema.

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## **IPRATROPIUM BROMIDE (Atrovent)**

- **Precautions:** same as other bronchodilators.
- **Contraindications:** Hypersensitivity to drug and Atropine.
- **Ipratropium Bromide .02% (Atrovent) 0.5 mg/2.5ml updraft x1 (used only once)**

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## **KETOROLAC (Toradol)**

- **Class:** Non-steroidal, anti-inflammatory agent (NSAID)
- **Action:** anti-inflammatory agent, Analgesic working at the synapse of the peripheral nerves.
- **Indications:** Mild to moderate pain
- **Dosage:** IV 30 mg, if older than 65 years 15 mg IV, IM 30 – 60 mg
- **Contraindications:** Asthma and hypersensitivity to aspirin.

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## **LORAZEPAM (Ativan)**

- **Class:** Tranquilizer
- **Actions:** Anticonvulsant, Sedative. The most potent benzodiazepine.
- **Indications:** Major motor seizures, Status epilepticus, Premedication before cardioversion, Acute anxiety states.
- **Dosage:** 0.5 – 2.0 mg IV, 2 – 4 mg IM
- **Pediatrics:** 0.03 – 0.5 mg/kg maximum dose 4 mg

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## **MEPERIDINE (Demerol)**

- **Class:** Narcotic
- **Actions:** Central Nervous System depressant, Decreases sensitivity to pain
- **Indications:** Moderate to severe pain
- **Dosage:** 25-50 mg IV, 50-100 mg IM
- **Pediatrics:** 1 mg/kg
- **Antidote:** Narcan

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## **METAPROTERENOL (Alupent)**

- **Class:** Sympathomimetic bronchodilator (Beta 2)
- **Actions:** relaxation of bronchial smooth muscle and to inhibit histamine (mucus).
- **Indications:** Asthma, Chronic Bronchitis, emphysema.
- **Dosage:** 0.2-0.3 ml/ 2.5-3.0 ml.

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## **METHYLPREDNISOLONE (Solu-Medrol)**

- **Class:** Steroid
- **Mechanism of Action:** synthetic adrenal corticosteroid. Reduces inflammation in the airways.
- **Indications:** Allergic Reactions, Asthma/COPD, Urticaria, Spinal Cord Injury.
- **Contraindications:** None in anaphylaxis.

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## **METHYLPREDNISOLONE (Solu-Medrol)**

- **Side effects:** headache, euphoria, confusion, vertigo, hypertension, CHF, nausea, vomiting.
- **Precautions:** Furosemide and Thiazide diuretics may increase potassium loss.
- **Dosage:** 125 – 250 mg IV/IM
- **Pediatric:** 1-2 mg/kg/dose

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## **METOPROLOL (Lopressor)**

- **Class:** Sympathetic Blocker (Beta 2)
- **Actions:** Beta blocker cardiac selective
- **Indications:** AMI, Hypertension

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## **MIDAZOLAM (Versed)**

- **Class:** Tranquilizer, benzodiazepine
- **Action:** Hypnotic, Sedative
- **Indications:** Premedication before cardioversion, Acute anxiety states, analgesic.
- **Contraindications:** Shock, Narrow angle glaucoma, intolerance to benzodiazepines.
- **Antidote:** Romazicon
- **Dosage:** 1.0-2.5 mg slow IV
- **Pediatrics:** 0.05 – 0.20 mg/kg

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## **NALBUPHINE (Nubain)**

- **Class:** Synthetic Narcotic Analgesic
- **Actions:** Central Nervous System Depressant, Decreases sensitivity to pain
- **Indications:** moderate to severe pain
- **Dosage:** 5 mg IV or IM repeat 2 mg doses 20 mg maximum (Narcan is antidote).
- **Pediatric:** 0.10 – 0.15 mg/kg (rarely used)

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## **NALOXONE (Narcan)**

- **Class:** Narcotic Antagonist
- **Actions:** displaces narcotic molecules from opiate receptors in the brain.
- **Indications:** reverse the effects of narcotic analgesics.
- **Dosage:** 0.4 – 2.0 mg IV or IM.
- **Pediatric:** 0.01 mg/kg IV/IM

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## **NIFEDIPINE (Procardia)**

- **Class:** Calcium Channel Blocker
- **Actions:** relaxes smooth muscle, decreases peripheral vascular resistance
- **Indications:** Severe hypertension, Angina Pectoris
- **Dosage:** 10 – 20 mg SL, puncture capsule & place under patient's tongue.

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## **NITROGLYCERIN INFUSION**

- **Class:** Antianginal/Potent vasodilator
- **Actions:** relaxes smooth muscle, decreases peripheral vascular resistance, reduces preload and afterload, increases blood flow through collateral coronary blood vessels.

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## **NITROGLYCERIN INFUSION**

- **Indications:** Chest Pain associated with Angina Pectoris and Myocardial Infarction, CHF, Hypertension.
- **Dosage:** 25 mg in 500 ml or 12.5 mg in 250 ml: Start at 5-15 mcg/minute via infusion regulator titrate to effect.
- **Precautions:** Hypotension, do not administer to a patient who has taken Viagra within 24 hours (severe hypotension can result).

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## **NITROUS OXIDE (Nitronox)**

- **Class:** Analgesic
- **Actions:** Weak anesthetic with sedative and analgesic properties.
- **Indications:** Pain control for angina, acute abdominal pain, environmental cold, extremity injuries, and burns.
- **Precautions:** Nausea and vomiting.

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## **NITROUS OXIDE (Nitronox)**

- **Contraindications:** Head injuries, Chest injuries, COPD < Pulmonary edema, Pregnancy under 20 weeks, bowel obstruction, decompression syndrome, and shock regardless of cause.
- **Dosage:** Self administered 50% Oxygen, and 50% Nitrous Mixture

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## **OXYTOCIN (Pitocin)**

- **Class: Hormone**
- **Actions: Causes uterine contraction, Causes lactation, Slows Postpartum bleeding**
- **Indications: Postpartum vaginal bleeding**

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## **PANCURONIUM BROMIDE (Pavulon)**

- **Class: Neuromuscular blocking agent**
- **Actions: Skeletal muscle relaxant, Paralyzes skeletal muscles including respiratory muscles**
- **Indications: To achieve paralysis to facilitate endotracheal intubation**
- **Precautions: Paralysis occurs in 3-5 minutes and lasts 60 minutes**
- **Dosage: Adult and Pediatric 0.04 – 0.1 mg/kg IV**

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## **PHENOBARBITAL (Luminal)**

- **Class: Anticonvulsant**
- **Actions: sedative and hypnotic effects.**
- **Indications: control seizures, status epilepticus.**
- **Precautions: sensitivity**
- **Dosage: Adult and Pediatric 100 – 300 mg slow IVP/ IM, Pediatric 6 – 10 mg/kg**

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## **PHENYTOIN (Dilantin)**

- **Class: Anticonvulsant/ Antiarrhythmic**
- **Actions: Inhibits seizure activity through motor cortex**
- **Indications: Major Seizures, Status Epilepticus, Arrhythmias due to digitalis toxicity**

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## **PONTOCAINE OPHTHALMIC**

- **Class:** Local Anesthetic
- **Actions:** Blocks both the initiation and conduction of nerve impulses by decreasing the neuronal membrane's permeability to sodium ions.

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## **PONTOCAINE OPHTHALMIC**

- **Indication:** reduce irritation of the eyes due to chemicals
- **Contraindications:** hypersensitivity to drug, damage to the globe of the eye.
- **Side effects/Caution:** None
- **Dosage:** 1 – 2 gtts per affected eye.

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## **PROCHLORPERAZINE (Compazine)**

- **Class:** Phenothiazine Antiemetic
- **Actions:** Antiemetic
- **Indications:** Nausea and Vomiting & Acute psychosis
- **Precautions:** Dystonic reactions

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## **PROMETHAZINE (Phenergan)**

- **Class:** Antihistamine antagonist
- **Actions:** Mild Anticholinergic activity  
Antiemetic, potentiates actions of analgesics
- **Indications:** Nausea and Vomiting, Motion sickness, Sedation
- **Dosage:** 12.5-25.0 mg
- **Pediatrics:** 0.5 mg/kg

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## **RACEMIC EPINEPHRINE (Vapanephrine)**

- **Class: Sympathomimetic: Slightly different than epinephrine. Stimulated both alpha and beta adrenergic receptors with a preference to beta 2 receptors.**
- **Actions: Bronchodilation-decrease mucus secretion, and reduces subglottic edema. Increases heart rate, contractile force**

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## **RACEMIC EPINEPHRINE (Vapanephrine)**

- **Indication: Croup**
- **Contraindications: Epiglottitis, tachyarrhythmias**
- **Side Effects: headache, angina, palpation, tachycardia**
- **Caution in patients using antihistamines or tricyclic antidepressants (adverse cardiac effects)**
- **Dosage: Adult and Pediatric - 0.25-0.75 ml of 2.25 solution/nebulizer updraft.**

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## **SODIUM NITROPRUSSIDE (Nipride)**

- **Class: Potent vasodilator**
- **Actions: Peripheral vasodilator**
- **Indications: Hypertensive emergencies**
- **Dosage: 0.5 mcg/kg/min**
- **Precaution: Hypotension.**

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## **SYRUP of IPECAC**

- **Class: Emetic**
- **Actions: Induces vomiting (in brain)**
- **Indications: Poisoning and overdose**
- **Contraindications: Reduced level of consciousness, caustic substances, petroleum ingestion, antiemetic ingestion.**
- **Dosage: 30 ml with at least 8 oz of water**

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## **THIAMINE**

- **Class: Vitamin**
- **Actions: converts glucose into energy, must be provided.**
- **Indications: Altered level of consciousness, coma of unknown origin, chronic alcoholism with associated coma.**
- **Dosage: 100 mg IVP**

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## **VERAPAMIL & DILTIAZEM (Calan - Isoptin, Cardizem)**

- **Mechanism of Action - Both are calcium channel blocking agents that slow conduction and increase refractoriness in the AV node. These actions terminate reentrant arrhythmias that require AV nodal conduction.**

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## **VERAPAMIL & DILTIAZEM (Calan - Isoptin, Cardizem)**

- **Verapamil is a negative inotropic agent that causes a reduction in myocardial oxygen requirement. May also control ventricular response in A-Fib, A-Flutter, or multifocal Atrial Tachycardia.**

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## **VERAPAMIL & DILTIAZEM (Calan - Isoptin, Cardizem)**

- **Indications - Used in the treatment of Paroxysmal Supraventricular Tachycardia (PSVT) narrow complex and ventricular rate control in Atrial Fibrillation. However, Adenosine is the drug of choice.**

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## **VERAPAMIL & DILTIAZEM (Calan - Isoptin, Cardizem)**

- **Precautions - Possible hemodynamic compromise. Should not be used in WPW syndrome or impaired heart function.**
- **Calcium is used for possible overdose of Verapamil or other Calcium channel blocker.**

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## **VERAPAMIL & DILTIAZEM (Calan - Isoptin, Cardizem)**

- **Dosage:  
Verapamil: 2.5 - 5.0 mg IV over 2 minutes. Repeat doses of 5 - 10 mg every 15 to 30 minutes to a maximum of 30 mg.  
Diltiazem: 0.25 mg/kg over 2 minutes followed by 0.35 mg/kg. Produces less myocardial depression than Verapamil.**

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## **THE END**

**This Microsoft PowerPoint presentation was prepared by Rob Holborn Ed.D, EMT-P, Seminole Community College.**

**The presentation was prepared by using the textbook: Guidelines 2000 for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care: International Consensus on Science and the 1998 National EMT-Paramedic Curriculum**

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