

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:** beta₁ 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 hiccoughs, 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 $\frac{1}{2}$ 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, palpitation, 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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