Drug Formulary (Effective April 15th 2017)

RIGHT PATIENT

RIGHT DRUG

RIGHT DOSE

RIGHT TIME

RIGHT ROUTE

RIGHT DOCUMENTATION
ACTIVATED CHARCOAL

Classification: Chemical Absorbent

Actions: Binds to medications and chemicals in the gastrointestinal tract.

Indications: ORAL poisoning/overdose of drugs or chemicals, with time of ingestion at or under one hour.

Contraindications:
1. Ingestion of caustics or corrosives
2. Ingestion of cyanide, heavy metals (i.e. iron, arsenic, mercury) petroleum distillates or any other caustic substance.
3. Altered LOC/lack of gag reflex

Adverse Effects: Gastrointestinal Nausea/vomiting Respiratory Aspiration

Administration:

**ADULT DOSE**
50 Gm orally

**PEDIATRIC DOSE**
25 Gm orally

Onset: Immediate

Duration: 12-24 Hours

Notes:
- Activated Charcoal commonly comes in two preparation forms: with Sorbitol and Aqueous (without Sorbitol). Only the Aqueous form of charcoal is permitted for prehospital use in San Luis Obispo County. Sorbitol is a cathartic and a sweetener that will speed elimination of ingested drugs or chemicals via a profound osmotic diarrhea and adds taste to the Charcoal for oral administration.

- Do not use in a patient with potential airway compromise. Activated Charcoals should only be administered to patients who can hold the bottle and drink without assistance.

- In acetaminophen ingestion it may interfere with the antidote (Acetylcysteine/Mucomyst) given at the hospital. If given make sure to notify receiving MD so initial Mucomyst dose can be modified.

- Activated Charcoal is commonly packaged in 50 gram/8 ounce preparations and must be shaken vigorously prior to administration.
ADENOSINE (Adenocard®)

**Classification:** Antidysrhythmic Agent

**Actions:**
1. Depresses automaticity in the sinus node
2. Suppresses AV conduction
3. Interrupts re-entry pathways through the AV node

**Indications:** Patient in moderate distress due to narrow complex SVT refractory to valsalva maneuver.

**Contraindications:**
1. Second or third degree AV heart block
2. Poison or drug-induced tachycardia
3. Sick sinus syndrome
4. Known hypersensitivity to Adenosine

**Adverse Effects:**

<table>
<thead>
<tr>
<th>Cardiovascular</th>
<th>Respiratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest pain/pressure</td>
<td>Dyspnea</td>
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<tr>
<td>Transient PAC’s, PVC’s</td>
<td>Bronchoconstriction in</td>
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<tr>
<td>Asystole (transient)</td>
<td>Patients with asthma/COPD</td>
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<tr>
<td>Hypotension</td>
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<tr>
<td>Bradycardia</td>
<td>Metabolic</td>
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<td></td>
<td>Flushed skin</td>
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<table>
<thead>
<tr>
<th>Neurological</th>
<th>Gastrointestinal</th>
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</thead>
<tbody>
<tr>
<td>Headache/blurred vision</td>
<td>Nausea</td>
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<tr>
<td>Tingling/numbness</td>
<td>Metallic taste</td>
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<tr>
<td>Lightheadedness/dizziness</td>
<td>Throat tightness</td>
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<tr>
<td>Seizures</td>
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</tbody>
</table>

**Administration:**

**ADULT DOSE**
1. Place patient in mild reverse Trendelenburg position, if possible
2. First dose: 6mg rapid IV followed immediately by a 20 cc NS bolus
3. If no conversion: 12 mg rapid IV followed immediately by a 20 cc NS bolus, may repeat once
4. Record rhythm strip during administration

**PEDIATRIC DOSE**
1. Place patient in mild reverse Trendelenburg position, if possible
2. First dose: 0.1 mg/kg rapid IV, followed immediately with a 20 cc NS bolus
3. Second dose: 0.2 mg/kg rapid IV, followed immediately with a 20 cc NS bolus
   **Do not repeat again**
ADENOSINE (Adenocard®)—continued

Onset: Immediate

Duration: Less than 10 seconds

Notes:
- Theophylline may require larger doses or may actually render Adenosine ineffective.
- Adverse effects usually resolve spontaneously within 1-2 minutes.
- Adenosine will not be effective on A-fib or A-flutter because it only operates on the AV node, not on the internodal pathways. If given for WPW with wide complex (irregular) atrial fibrillation, it may result in VF. Though not recommended for ventricular tachycardia, it is generally safe. However, Adenosine may cause 2nd and 3rd blocks.
- Adenosine may produce transient blocks for diagnosis of rapid tachydysrhythmias that are not easily distinguishable as A-fib or A-flutter.
- Adenosine is naturally occurring and is found in all body cells as adenosine triphosphate (ATP).
- In infants and children sinus tachycardia is usually associated with a HR< 200, SVT will usually manifest with a HR>230.
- Persantine® (dipyridamole) inhibits the transport and potentiates the effects of Adenosine. Tegretol® (carbamazepine) may potentiate the degree of AV block caused by Adenosine.
ALBUTEROL (Proventil®, Ventolin®)

Classification: Bronchodilator (Beta 2 specific)

Actions:
1. Relaxes bronchial smooth muscle
2. Decreases airway resistance

Indications:
1. Respiratory distress with wheezes/bronchospasm
2. Anaphylaxis with or without shock
3. SOB due to COPD or asthma

Contraindications: Known hypersensitivity to Albuterol

Adverse Effects:

<table>
<thead>
<tr>
<th>Neurological</th>
<th>Cardiovascular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tremors</td>
<td>Tachycardia</td>
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<tr>
<td>Headache/dizziness</td>
<td>Hypertension</td>
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<td>Sweating</td>
<td>Dysrhythmias</td>
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<tr>
<td>Anxiety</td>
<td>Palpitations</td>
</tr>
</tbody>
</table>

Gastrointestinal
Nausea/vomiting

Administration:

**ADULT DOSE**
2.5-5 mg via HHN/mask/BVM with adjunct over 5-10 minutes, repeat as needed

**PEDIATRIC DOSE**
2.5-5 mg via HHN/mask/BVM with adjunct over 5-10 minutes, repeat as needed.

Onset: 5-15 minutes
Duration: 4-6 hours

Notes:
- Beta blocking agents inhibit the effects of Albuterol.
- Albuterol should be administered with oxygen, and be sure to closely monitor the patient’s vital signs and cardiac status.
ASPIRIN


Action:
1. Inhibits prostaglandin synthesis
2. Irreversibly inactivates the enzyme cycloxygenase in circulating platelets

Indications: Aspirin administration should be considered for any complaint of suspected cardiac origin regardless of chest pain.

Contraindications:
1. Anaphylaxis to aspirin or other salicylates
2. Patients who have a known hypersensitivity/prior allergic reaction to Aspirin, Ibuprofen, Naproxen, or other non-steroidal anti-inflammatory drugs.

Adverse Effects:

<table>
<thead>
<tr>
<th>Respiratory</th>
<th>Gastrointestinal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronchospasm</td>
<td>Nausea/vomiting</td>
</tr>
<tr>
<td>Asthma like symptoms</td>
<td>Gastric upset</td>
</tr>
<tr>
<td></td>
<td>GI bleeding</td>
</tr>
<tr>
<td>Other</td>
<td>Potentiation of peptic ulcer</td>
</tr>
<tr>
<td>Skin rash</td>
<td></td>
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<tr>
<td>Anaphylaxis</td>
<td></td>
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<tr>
<td>Prolonged bleeding</td>
<td></td>
</tr>
</tbody>
</table>

Administration: **ADULT DOSE**
162 mg of non-enteric coated tablets chewed and swallowed

Notes:
- The patient should be advised to chew the tablets prior to swallowing.
- Aspirin may increase the risk of bleeding especially when combined with anticoagulants and thrombolytic therapy.
ATROPINE SULFATE

Classification: Parasympathetic blocker

Actions:
1. Inhibits parasympathetic stimulation by blocking acetylcholine at the muscarinic receptors.
2. Decreases vagal tone resulting in increased heart rate at the AV conduction.
3. Dilates bronchioles and decreases respiratory tract secretions.
4. Decreases gastrointestinal secretions.

Indications:
1. Bradycardia
2. Organophosphate poisoning
3. Exposure to nerve agents

Contraindications: None significant in the above indications.

Adverse Effects:

<table>
<thead>
<tr>
<th>Neurological</th>
<th>Cardiovascular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restlessness</td>
<td>Tachycardia</td>
</tr>
<tr>
<td>Seizures</td>
<td>Greater oxygen demand</td>
</tr>
<tr>
<td>Pupillary dilation</td>
<td></td>
</tr>
<tr>
<td>Blurred vision</td>
<td>Respiratory</td>
</tr>
<tr>
<td>Dizziness</td>
<td>Mucous plugs</td>
</tr>
<tr>
<td>Confusion</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other</th>
<th>Gastrointestinal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot, dry skin</td>
<td>Dry mouth</td>
</tr>
<tr>
<td>Worsens glaucoma</td>
<td>Difficulty swallowing</td>
</tr>
</tbody>
</table>

Administration:

**ADULT DOSE**
1. **Bradycardia**: 0.5 mg IVP, repeat every 3-5 minutes, not to exceed 3 mg
2. **Organophosphate poisoning**: 2 mg IV/IO/IM, repeat as needed, per physician order

**PEDIATRIC DOSE**
Remember that Epi. 1:10,000 IVP/IO is the recommended initial medication for the pediatric patient with bradycardia.
1. **Base Order for Symptomatic Bradycardia**: 0.02 mg/kg IV/IO, minimum dose of 0.1 mg and a maximum dose of 0.5 mg, may repeat once in 3-5 minutes, not to exceed 1 mg
2. **Organophosphate poisoning**: 0.05 – 0.1 mg/kg IV/IO/IM, repeat every 5-15 min, per physician order

Onset: 2-5 minutes
Duration: 20 minutes
Notes:

- See Weapons of Mass Destruction Guidelines for complete instructions for nerve agent exposure.

- **OPTIONAL- Use for agencies carrying the MARK 1 kits**

  **Exposure to nerve Agents:** (self-administration)
  
  a. Mild Signs: MARK I auto-injector antidote kit, 1 dose initially, may repeat once in 10 minutes, not to exceed 2 doses
  
  b. Moderate Signs: MARK I auto-injector antidote kit, 1 dose initially, may repeat once in 10 minutes, not to exceed 2 doses
  
  c. Severe Signs: MARK I auto-injector antidote kit, 3 doses initially

- Place patient on oxygen and cardiac monitor during administration, as Atropine increases oxygen demands by increasing the heart rate.

- Use with caution in a patient with suspected myocardial ischemia

- The acronym “SLUDGE” is used to represent the various signs/symptoms of an organophosphate poisoning. These signs/symptoms include increased salivation, lacrimation, urination, defecation, gastrointestinal cramping, and emesis. Some common organophosphates include bug bombs, roach/ant sprays, flea and tick collars, and common garden sprays. Atropine is the medication of choice in this situation since it prevents the over-stimulation of the muscarinic receptors.
CALCIUM CHLORIDE (CaCl2)
(Base Hospital Order Only)

Classification: Electrolyte

Actions:
1. Acts as an activator in transmission of nerve impulses and contraction of cardiac, skeletal, and smooth muscles.
2. Maintains cell membrane and capillary permeability.

Indications:
1. Cardiac arrest or significant instability associated with hyperkalemia (suspect in renal failure) or Ca channel blocker toxicity.
2. Overdose on Calcium Channel Blocker medications.

Contraindications: Hypercalcemia

Adverse Effects:
Cardiovascular: Cardiac arrest
Metabolic: Hypercalcemia

Administration:
ADULT DOSE
1 Gm slow IVP

PEDIATRIC DOSE
20 mg/kg slow IVP maximum 500 mg

Onset: Immediate

Duration: 30 minutes - 2 hours

Notes:
- Calcium Chloride will precipitate if in a solution with Sodium Bicarbonate.
DEXTROSE 25%

**Classification:** Hyperglycemic Agent

**Action:** Increases blood sugar

**Indications:**
1. Blood glucose level < 60mg/dl with:
   a. Altered LOC
   b. Apnea / agonal respirations
   c. Non-traumatic focal neurological changes
   d. Seizures

**Contraindications:** For patients with the signs or symptoms of a CVA, do not administer dextrose unless the Glucoscan/glucose test strip reading is < 60 mg/dl. If equipment is not available to test the blood glucose level, base physician approval must precede any administration of dextrose.

**Adverse Effects:** Metabolic
   - Pain/burning at injection site
   - Tissue necrosis
   - Hyperkalemia

**Preparation:** Optional dilution when Dextrose 25% pre-load not available

1. Use a 250 ml bag NS
2. Remove and discard 200 ml of NS
3. Add 50 ml of Dextrose 50%
4. Verify total volume of 100 ml of Dextrose 25%
5. This concentration is now approximately 0.25 Gm/ml

**Administration:** PEDIATRIC DOSE (< 34 KG)
0.5 Gm/kg (2 ml/kg) slow IVP over 5 minutes

**Onset:** Immediate

**Duration:** Brief

**Notes:**
- Dextrose 25% in water is a concentrated solution and is very irritating to the venous tissue. Cannulate as large a vein as possible and aspirate prior to administration.
DEXTROSE 50%

Classification: Hyperglycemic Agent

Action: Increases blood sugar

Indications:
1. Blood glucose level < 60mg/dl with:
   a. Altered LOC
   b. Apnea / agonal respirations
   c. Non-traumatic focal neurological changes
   d. Seizures

Contraindications: For patients with the signs or symptoms of a CVA, do not administer dextrose unless the Glucoscan/glucose test strip reading is < 60 mg/dl. If equipment is not available to test the blood glucose level, base physician approval must precede any administration of dextrose.

Adverse Effects: Metabolic
   Pain/burning at injection site
   Tissue necrosis
   Hyperkalemia

Administration: ADULT DOSE
   25 Gm (50 ml) slow IVP

Onset: Immediate

Duration: Brief

Notes:
- Dextrose 50% in water is a concentrated solution and is very irritating to the venous tissue. Cannulate as large a vein as possible and aspirate prior to administration.
DIAZEPAM (Valium®)
(To be used ONLY under order of the LEMSA medical director when Midazolam is unavailable or as part of a disaster cache)

Classification: Anticonvulsant/Tranquilizer

Actions:
1. Promotes muscle relaxation through inhibition of spinal motor reflex pathways.
2. Suppresses seizure activity through suppression of the motor cortex of the brain.
3. Produces amnesic effect
4. Skeletal muscle relaxant

Indications:
1. Active, continuous seizure
2. Status epilepticus
3. Sedation prior to cardioversion
4. Acute behavior disorder
5. Severe muscle spasms (base physician order only)

Contraindications (relative):
1. History of hypersensitivity to the drug
2. Hold for CNS depression, respiratory depression and hypotension
3. ALOC of unknown etiology
4. Eclampsia (base physician order only)

Adverse Effects:
Cardiovascular
Hypotension

Neurological
Dizziness
Ataxia

Respiratory
Fatigue
Depression

Adversal Effects:
Pain/burning at injection site

Administration:
ADULT DOSE
1. Seizure: 0.3mg/kg slow IVP, titrated to terminate seizure activity, not to exceed 20 mg. If unable to establish an IV, administer 0.3 mg/kg per rectum (PR) via a lubricated 3 ml syringe, titrated to terminate seizure activity, not to exceed 20 mg
2. Pre-cardioversion: 2.5-10 mg IVP
DIPHENHYDRAMINE (Benadryl®)

Classification: Antihistamine

Actions:
- Reverses histamine induced bronchospasm, vasodilation, and increased capillary membrane permeability.
- Relaxes smooth muscle.
- Binds to the histamine receptor sites, thus suppressing the allergic reaction.
- Has an associated sedative effect.

Indications:
- Anaphylaxis
- Acute allergic reaction
- Extrapyramidal/dystonic reactions due to phenothiazines

Contraindications:
- 0. Narrow angle glaucoma
- 1. Pregnancy
- 2. Acute asthma

Adverse Effects:
- Cardiovascular
  - Hypotension
  - Palpitations
  - Tachycardia
- Neurological
  - Drowsiness/confusion
  - Decreased coordination
  - Blurred vision
- Gastrointestinal
  - Dry mouth
- Respiratory
  - Mucous plugs
- Other
  - Urinary retention

Administration:
- **ADULT DOSE**
  - 50 mg slow IVP/IM.
- **PEDIATRIC DOSE**
  - 2 mg/kg slow IVP/IM, not to exceed 50 mg.

Base physician order required for stable patients

Onset: 15-30 minutes

Duration: 4-8 hours
Notes:

- Closely monitor blood pressure and cardiac status before and after administration of Diphenhydramine. Reassess respiratory status and lung sounds after administration.

- Histamines are found in nearly all tissues of the body and are released after skin damage or inflammation. Histamines cause vasodilation and contraction of smooth muscle, which may induce severe hypotension.

- Histamine release can lead to increased capillary permeability and leaking. The intravascular fluid leaks through dilated capillary pores and may result in pulmonary or laryngeal edema. This leaking fluid also leads to edema of the skin (hives/urticaria). Diphenhydramine works by blocking further release of histamines.

- Dystonic reaction signs and symptoms include eye deviation, head jerking, dysphasia, involuntary arm/leg twitching and hypotension.
DOPAMINE (Intropin®)  
(Base Hospital Order Only)

Classification: Sympathomimetic agent (catecholamine)

Actions: **Moderate Dose: (5-10 mcg/kg/min) (β receptors)**  
1. Increases inotropy and may increase chronotropy  
2. Increases BP by stimulating β1 receptors increasing cardiac output with small increase in peripheral vascular resistance.

**High Dose: (Over 10-20 mcg/kg/min) (primarily α receptors, some β)**  
1. Causes vasoconstriction  
2. Increases inotropy and chronotropy  
3. Increases BP by stimulating α and β1 receptors

Indications:  
1. Symptomatic bradycardia persisting after prior therapies  
2. Cardiogenic shock with signs/symptoms of CHF or not responding to fluid challenge  
3. Hypotension

Contraindications:  
1. Hypovolemia  
2. Tachydysrhythmias

Adverse Effects:  
**Cardiovascular Respiratory**  
Tachycardia dyspnea  
Hypertension increase O2 demand  
Ventricular irritability  
Chest pain  

**Gastrointestinal**  
Nausea/vomiting

Administration: **ADULT DOSE**  
400 mg in 250 ml NS (1600 mcg/ml) IV drip, by base physician order: 5-20 mcg/kg/min, titrated to blood pressure.

**PEDIATRIC DOSE**  
400 mg in 250 ml NS (1600 mcg/ml) IV drip, by base physician order: 5-20 mcg/kg/min, titrated to blood pressure.

Onset: 5 minutes  
Duration: 5-10 minutes
DOPAMINE (Intropin®) (Base Physician Order Only) CONTINUED

Notes:
- Consider expediting transport in cases requiring Dopamine administration.
- Dopamine may be inactivated by alkaline solutions such as Sodium Bicarbonate.
- Start in the largest possible vein and ensure patency prior to administration, as Dopamine is likely to cause tissue necrosis upon entering the interstitial space.
- Establish a second IV line for other medications, as the Dopamine infusion should not be interrupted.
- In the upper end of the moderate dosage range, α receptors are stimulated and peripheral vasoconstriction occurs.
- In the high dose range, α receptors override the dopaminergic receptors, resulting in decreased renal and mesenteric perfusion.

<table>
<thead>
<tr>
<th>Weight in:</th>
<th>Dose</th>
<th>5 mcg/kg</th>
<th>10 mcg/kg</th>
<th>15 mcg/kg</th>
<th>20 mcg/kg</th>
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</thead>
<tbody>
<tr>
<td>lbs/kg</td>
<td>Microdrips per Minute</td>
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<td>87</td>
<td>116</td>
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</tr>
</tbody>
</table>
EPINEPHRINE 1:1,000 (Adrenalin®)

Classification: Sympathomimetic agent (catecholamine)

Actions:

1. Increases cardiac output due to increased inotropy, chronotropy, dromotropy, and AV conduction (b1 effect)
2. Relaxes smooth muscles of the respiratory tract (b2 effect)
3. Increases systolic blood pressure due to increased cardiac output (b1 effect) and vasoconstriction (a effect)
4. Increases coronary perfusion during CPR by increasing aortic diastolic pressure

Indications:

1. Cardiopulmonary arrest
2. Anaphylaxis
3. Respiratory distress with wheezing
4. Pediatric symptomatic bradycardia
5. Neonatal resuscitation
6. Suspected croup or epiglottitis

Contraindications:

1. Use with caution in pregnancy.
2. Consider base physician consultation if possible if the patient has history of MI, angina or hypertension.

Adverse Effects:

<table>
<thead>
<tr>
<th>Cardiovascular</th>
<th>Neurological</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tachycardia</td>
<td>Anxiety</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Dizziness</td>
</tr>
<tr>
<td>Chest pain</td>
<td>Headache</td>
</tr>
<tr>
<td>Palpitations</td>
<td>Tremors</td>
</tr>
<tr>
<td>Ventricular fibrillation</td>
<td>Seizures</td>
</tr>
</tbody>
</table>

Gastrointestinal
Nausea/vomiting

Administration:

**ADULT DOSE**

1. **Asthma:** 0.01 mg/kg IM, not to exceed 0.5 mg, may repeat every 5 minutes, not to exceed 3 doses

2. **Allergic reaction/anaphylaxis:** 0.01 mg/kg IM, not to exceed 0.5 mg, may repeat every 5 minutes, not to exceed 3 doses

3. If the patient is in extremis: 0.01 mg/kg **SL** injection, not to exceed 0.5 mg, may repeat every 5 minutes, not to exceed 3 doses
EPINEPHRINE 1:1,000 (Adrenalin®) CONTINUED

PEDIATRIC DOSE
1. **Asthma:** 0.01 mg/kg, IM, not to exceed 0.3 mg, may repeat every 5 minutes, not to exceed 3 doses

2. **Allergic reaction/anaphylaxis:** 0.01 mg/kg, IM, not to exceed 0.3 mg, may repeat every 5 minutes, not to exceed 3 doses

3. If the patient is in extremis: 0.01 mg/kg **SL** injection, not to exceed 0.3 mg, may repeat every 5 minutes, not to exceed 3 doses

4. **Bradycardia:** The first line drug in pediatric bradycardia is epinephrine 1:10,000

Notes:
- IM administration is with 1-1½” needle in anterior/lateral thigh or deltoid.
- SL injection is with a small 25 gauge ¼” TB syringe.
- Tachycardia is not a contraindication to Epinephrine.
EPINEPHRINE 1:10,000 (Adrenalin®)

Classification: Sympathomimetic agent (catecholamine)

Actions:
1. Increases cardiac output due to increased inotropy, chronotropy, dromotropy, and AV conduction (b1 effect)
2. Relaxes smooth muscles of the respiratory tract (b2 effect)
3. Increases systolic blood pressure due to increased cardiac output (b1 effect) and vasoconstriction (a effect)
4. Increases coronary perfusion during CPR by increasing aortic diastolic pressure

Indications:
1. Cardiopulmonary arrest
2. Anaphylaxis
3. Respiratory distress with wheezing
4. Pediatric symptomatic bradycardia
5. Neonatal resuscitation
6. Suspected croup or epiglottitis

Contraindications:
1. Use with caution in pregnancy.
2. Consider base physician consultation if possible if the patient has a history of MI, angina or hypertension.

Adverse Effects:

<table>
<thead>
<tr>
<th>Cardiovascular</th>
<th>Neurological</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tachycardia</td>
<td>Anxiety</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Dizziness</td>
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<tr>
<td>Chest pain</td>
<td>Headache</td>
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<tr>
<td>Palpitations</td>
<td>Tremors</td>
</tr>
<tr>
<td>Ventricular fibrillation</td>
<td>Seizures</td>
</tr>
</tbody>
</table>

Gastrointestinal
Nausea/vomiting

Administration:

**ADULT DOSE**
1. **Cardiac Arrest:** 1 mg IVP/IO, may repeat every 3-5 minutes
2. **Anaphylaxis:** base physician order only 0.01 mg/kg, slow IVP titrated, not to exceed 0.5 mg
3. **Asthma:** base physician order only 0.01 mg/kg, slow IVP titrated, not to exceed 0.5 mg

**PEDIATRIC DOSE**
1. **Cardiac Arrest:** 0.01 mg/kg (0.1 ml/kg) slow IVP/IO, repeat every 3-5 minutes
EPINEPHRINE 1:10,000 (Adrenalin®) - continued

2. **Symptomatic Bradycardia:** 0.01 mg/kg (0.1 ml/kg) slow IVP/IO, not to exceed 0.3 mg per dose, repeat every 3-5 minutes

3. **Anaphylaxis:** *base physician order only* 0.01 mg/kg (0.1 ml/kg) slow IVP titrated, not to exceed 0.3 mg

4. **Respiratory Distress:** *base physician order only* 0.01 mg/kg (0.1 ml/kg) slow IVP titrated, not to exceed 0.3 mg

**Notes:**

- Use Epinephrine with caution in older patients. If a patient is clearly in anaphylaxis, this is the drug of choice, even in older patients. If doubt exists, initiate early base hospital contact, prior to drug therapy.

- Tachycardia is not a contraindication to Epinephrine.

- **Base physician order** for Epinephrine 1:10,000, 0.01mg/kg titrated IV not to exceed 0.5mg for circulatory collapse from anaphylaxis.

- IM administration is with 1-1½" needle in anterior/lateral thigh or deltoid.
GLUCAGON HYDROCHLORIDE (Glucogan®)

Classification: Hyperglycemic agent / Pancreatic hormone

Actions:
1. Stimulates breakdown of glycogen in the liver to increase blood sugar.
2. Increases inotropy and chronotropy.

Indications:
1. Known or suspected hypoglycemia when unable to administer Dextrose IVP x two (2) attempts or Oral Glucose.
2. Cardiac arrest with suspected Beta Blocker or Calcium Channel Blocker overdose (base physician order only).
3. Beta Blocker overdose (base physician order only).
4. Consider for esophageal foreign body obstruction (base physician order only).

Contraindications: For the patient with signs or symptoms of a CVA, do not administer unless blood glucose is <60 mg/dl. If the equipment to test blood glucose is not available, base physician approval must be obtained prior to administration.

Adverse Effects: Gastrointestinal
Nausea/vomiting

Administration:

**ADULT DOSE**
1. Hypoglycemia: 1 mg IM
2. Beta Blocker OD: 3-10 mg slow IVP (when cache available)

**PEDIATRIC DOSE**
1. Hypoglycemia: 0.1 mg/kg IM, not to exceed 1 mg
2. Beta Blocker OD: 0.1 mg/kg slow IV/IM

Onset: Within 15 minutes

Duration: 15-30 minutes

Notes:
- Caution is advised in administration to a patient with cardiovascular disease due to inotropic and chronotropic effects.
- Glucagon is packaged as a powder that must be reconstituted prior to administration.
- Glucagon takes effect via conversion of stored glycogen in the liver. If the patient is low in stored glycogen due to alcoholism or malnutrition, Glucagon will be less effective.
- Requires EKG monitoring when used in higher doses for esophageal foreign body obstruction.
GLUCOSE (Oral)

Classification: Hyperglycemic agent

Actions: Provides an oral source of glucose rapidly utilized for cellular metabolism

Indications: Conscious patient with signs/symptoms of hypoglycemia

Contraindications:
1. Inability to swallow
2. Unconsciousness

Adverse Effects: Respiratory Gastrointestinal
Aspiration Nausea/vomiting

Administration: ADULT DOSE
15 Gm (1 tube), repeat as needed

PEDiatric DOSE
15 Gm (1 tube), repeat as needed

Onset: Rapid

Duration: Brief

Notes:
- Administer ONLY to patients with an intact gag reflex.
- Check blood glucose level prior to and after administration.
- Glucose administration can cause nausea and vomiting
LIDOCAINE (Xylocaine®)

**Classification:** Antidysrhythmic agent

**Action:** Suppresses ventricular ectopy by stabilizing the myocardial cell membrane.

**Indications:**
1. Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia
2. Post conversion or defibrillation of ventricular rhythms with base contact.
3. Ventricular tachycardia with pulse present
4. Symptomatic/malignant ventricular ectopy

**Contraindications:**
1. 2° degree type II heart block
2. 3° degree heart block
3. Junctional bradycardia
4. Ventricular ectopy associated with bradycardia
5. Idioventricular rhythm
6. Known allergy to Lidocaine or sensitivity to other anesthetics (report to base).

**Adverse Effects:**

**Cardiovascular**
- Bradycardia
- Hypotension
- Arrest
- Blurred vision

**Neurological**
- Dizziness
- Drowsiness
- Paresthesia
- Restlessness
- Slurred speech

**Respiratory**
- Dyspnea
- Depression
- Apnea
- Disorientation
- Seizures
- Lightheadedness
- Tinnitus
- Muscle twitching

**Gastrointestinal**
- Nausea/vomiting

**Administration:**

**ADULT DOSE**
1. **V-Fib/pulseless V-Tach:** 1.5 mg/kg IVP/IO, repeat every 3-5 minutes, not to exceed 3 mg/kg

2. **V-Tach with a pulse:** 1.5 mg/kg IVP, may repeat with 0.75 mg/kg IVP every 5-10 minutes, not to exceed 3 mg/kg

**PEDIATRIC DOSE**
1. **V-Fib/pulseless V-Tach:** 1 mg/kg IVP/IO. May repeat every 5 minutes, not to exceed 3 mg/kg
2. **V-Tach with a pulse:** 1 mg/kg IVP/IO, may repeat with 0.5 mg/kg IVP/IO every 5-10 minutes, not to exceed 3 mg/kg

**Onset:** 30 - 90 seconds

**Duration:** 10 - 20 minutes

**Notes:**

- In cases of premature ventricular contractions, assess need and treat underlying cause. Needs include: chest pain, syncope, R on T situations, multifocal and paired PVCs, bigeminy and trigeminy, and PVCs at 6-12 per minute. See appropriate protocols as needed.

- Lidocaine is to be administered no faster than 50mg/min, except in patients in cardiac arrest.
MIDAZOLAM (Versed®)

Classification: Benzodiazepine

Actions:
1. Hypnotic, amnesiac, sedative, anticonvulsant
2. Potent but short-acting, 3-4 times more potent than diazepam
3. Has NO effect on pain

Indications:
1. Active, continuous seizure
2. Status epilepticus
3. Sedation prior to cardioversion
4. Acute behavior disorder (agitated patient danger to self or others)
5. Severe muscle spasms (base physician order only)

Contraindications (Relative):
1. History of hypersensitivity to benzodiazepines
2. Shock with depressed vital signs
3. ALOC of unknown etiology/polypharmacy ingestion
4. Narrow-angle glaucoma
5. Eclampsia (base physician order only)

Adverse Effects (Precautions, Side Effects and Notes):
Midazolam may cause respiratory depression and/or hypotension especially if administered rapidly. Monitor patient closely.
1. Common side effects include drowsiness, hypotension, respiratory depression and apnea. These are more likely to occur in the very young and the very elderly. Rarely, patients may experience paradoxical agitation.
2. Respiratory depression is more likely in patients who have taken other CNS depressant drugs such as opioids, alcohol, other benzodiazepines or barbiturates, or when given rapidly.
3. Midazolam is metabolized in the liver and excreted by the kidneys. Doses should be adjusted accordingly in patients with underlying hepatic or renal diseases or cardiac diseases with low flow states such as CHF.
4. GI effects include nausea, vomiting, hiccough/hiccup
5. Pain at injection site (IV/IM), intranasal irritation if given IN

Administration:

**ADULT DOSE**

1. Seizure:
   - 1-2 mg SLOW IV or
   - 5 mg IM or IN (2.5 mg each nostril)
   - May repeat once after 10 min
2. **Pre-cardioversion sedation:**
   - 1-2 mg SLOW IV
   - 5 mg IN (intranasal) (split dose: 2.5 mg each nostril)
   - May repeat once after 10 minutes

3. **Agitated patient sedation** (danger to self or others):
   - 1-2 mg SLOW IV
   - 5 mg IM or IN (intranasal) (split dose: 2.5 mg in each nostril)
   - May repeat once after 10 minutes

***EKG, Pulse oximetry, and ETCO2 (when equipment is available) monitoring will be used at all times.

**PEDIATRIC DOSE**

1. **Seizure/Agitated Patient Sedation:**
   - 0.1 mg/kg SLOW IV
   - 0.1 mg/kg IM/IN not to exceed 5 mg
   - Total max dose 5 mg
   (IN volume for pediatric patient up to 0.3 ml per nostril)

2. **Pre-cardioversion:**
   - 0.1 mg / kg IN or SLOW IV.
   - Max 2mg

***EKG, Pulse oximetry, and ETCO2 (when equipment is available) monitoring will be used at all times.

**Onset:**
- 1.5 - 5 minutes IV
- 2 - 6 minutes IN
- 15 minutes IM

**Duration:**
- 2 - 6 hours for IV/IN/IM
MORPHINE SULFATE

Classification: Narcotic analgesic

Actions:
1. Acts directly on the CNS at the opiate receptor sites to relieve pain
2. Decreases myocardial oxygen demand
3. Causes venous pooling due to peripheral vasodilation
4. Reduces preload and afterload by decreasing venous return and systemic vascular resistance
5. Helps alleviate anxiety

Indications:
1. Chest pain associated with suspected MI
2. CHF/pulmonary edema
3. Pain associated with marine animal stings or spider/insect bites.
4. Situations in which pain control is a significant factor in transport of patient, such as a large area burn or an isolated fracture or dislocation.

Contraindications:
1. Altered LOC
2. Head injury and multisystem trauma
3. Pain of unknown etiology
4. Abdominal pain
5. A base physician order must be obtained if the BP is less than 100 systolic.

Adverse Effects:
Cardiovascular
Tachycardia
Bradycardia
Cardiac arrest
Hypotension

Neurological
Headache
Hallucinations
Dizziness
Tremors/seizures
Altered LOC/agitation

Gastrointestinal
Nausea/vomiting

Respiratory
Depression/arrest

Administration:

**ADULT DOSE**
1. Cardiac chest pain: 2-10 mg slow IVP titrated to pain improvement
2. Pulmonary edema: 1-3 mg slow IVP (base order only)
3. Pain management: 5 mg slow IVP/IM, may repeat once, not to exceed 10 mg.

**PEDIATRIC DOSE**
1. Pain management: 0.1 mg/kg slow IVP/IM, may repeat once, not to exceed 5 mg.
   Notify base physician of Morphine administration
MORPHINE SULFATE - continued

Onset: Immediate

Duration: 3-5 hours

Notes:
- Have Naloxone ready in the event of opiate-induced respiratory depression or arrest.
- Place patient on Oxygen and ECG prior to administration of Morphine Sulfate.
- Hypotension caused by Morphine Sulfate can be treated by shock position and/or fluid challenge.
- Morphine should not be given for the purpose of pain control in patients with significant abdomen, chest, or head trauma, or a patient in shock, unless ordered by the base physician.
- IV is preferred route
NARCAN (Naloxone®)

Classification: Narcotic antagonist

Actions:
1. Displaces narcotics from opiate receptor sites
2. Reverses respiratory depression, sedation, and pupillary effects of narcotics.

Indications: Respiratory depression and/or altered LOC associated with suspected narcotic overdose

Contraindications: None

Adverse Effects:
Cardiovascular
- Tachycardia
- Hypertension

Neurological
- Pupillary dilation

Gastrointestinal
- Nausea/vomiting

Administration:

**ADULT DOSE**
1. Titrate 1 mg IV/IM/IN (split dose between nares) – repeat to maintain adequate respirations (IV preferred route)
2. Extremis 0.5 mg SL - repeat to maintain adequate respirations

**PEDIATRIC DOSE**
1. Titrate 0.1 mg/kg IV/IM/IN (split doses between nares) -to a maximum dose of 1 mg – may repeat to maintain adequate respirations
2. Extremis 0.5 mg SL - repeat to maintain adequate respirations

Onset: 1-2 minutes

Duration: 45 minutes

Notes:
- Administer Narcan prior to intubation in a patient with severe respiratory depression when narcotic induced coma is suspected.
- If there is no response to IV Narcan after 1-2 minutes, the etiology of the altered level of consciousness should be questioned (5 minutes for IM).
- IM administration is with 1 1½ " needle in anterior/lateral thigh or deltoid.
- SL injection is with a small 25 gauge ¼" TB syringe.
NITROGLYCERIN
(Nitrostat®)(Nitro-Bid®)

Classification: Vasodilator

Actions:
1. Dilates coronary vessels enhancing coronary perfusion
2. Reduces coronary vasospasm
3. Decreases myocardial workload and oxygen demand
4. Relaxes vascular smooth muscle, resulting in peripheral vasodilation
5. Produces venous pooling due to vasodilation
6. Reduces preload and afterload

Indications:
1. Chest pain of suspected myocardial origin
2. Acute pulmonary edema

Contraindications: Blood pressure less than 100 systolic and/or other signs of poor perfusion

Adverse Effects:
Cardiovascular
- Orthostatic hypotension
- Tachycardia
- Palpitations

Neurological
- Throbbing headache
- Increased ICP
- Dizziness/syncope

Other
- Flushed skin
- Sublingual burning

Administration:
**ADULT DOSE Sublingual**
Persistent cardiac chest pain or pulmonary edema: 0.4 mg SL tablets or spray, may repeat every 5 minutes. Titrate to pain, BP and signs of perfusion

**ADULT DOSE – with CPAP**
Administer first dose(s) of Nitroglycerine SL and apply 2% topical Nitroglycerin patch - 1 Gm pre-packaged single dose: apply to chest area once mask is applied

Notes:
- Do not administer if BP drops <100 systolic and/or other signs of poor perfusion are present
- When BP < 100 consult the Base Hospital
- If at any time the BP drops <100 remove nitroglycerine patch
- Monitor BP trends. Administer with caution and consult with base physician if BP demonstrates significant decreases

Onset:
SL - 1-3 minutes
Topical – 15-60 minutes
**NITROGLYCERIN continued**

**Duration:**
- SL - 30-60 minutes
- Topical - 2-12 hours

**Notes:**

- Patients can develop a tolerance to Nitroglycerin.
- If administered via spray, hold can upright and do not shake can.
- Administering personnel must wear gloves to avoid inadvertent skin absorption.
- Nitroglycerin must be stored in a glass vial away from light, and tends to lose potency once exposed to air. The possibility that a patient's personal Nitroglycerin may have lost potency must be kept in mind when a patient takes Nitroglycerin for symptoms without relief.
- Avoid administering Nitroglycerin for patients with rales due to circumstances other than pulmonary edema/congestive heart failure (e.g. pneumonia).
- The impotence treatment drugs may have a cumulative vasodilatory effect when used in conjunction with Nitroglycerin. Pre-hospital providers should ask if the patient has taken any Viagra-like medications in the last 24 hours. The base hospital physician may still order Nitroglycerin if he/she feels that enough time has passed for the patient to have safely metabolized the drug.
- Use caution with defibrillation and/or cardioversion if topical Nitroglycerin patch is placed on the chest wall.
ONDANSETRON (Zofran)

Classification: Anti-emetic

Actions: Selective antagonism of the serotonin 5-HT3 receptor
Decreases or eliminates nausea
Decreases/prevents episodes of vomiting

Indications: Intractable vomiting or severe nausea for patients greater than 34 kg

Contraindications:
1. Children < 34 kg base physician order only
2. Pregnancy – base physician order only
3. Hypersensitivity to 5-HT3 receptor antagonists (i.e. Dolasetron (Anzemet), Granisetron (Kytril) or Palonosetron (Aloxi))
4. History of previous hypersensitivity to Zofran
5. Patients taking Apomorphine – (an injectable drug for Parkinson’s Disease or rarely for erectile dysfunction – Apokyn, Spontane, Uprima)
6. Do not administer orally to those with known sensitivity to Phenylketonurics (contains phenylaline)

Adverse Effects (Precautions, Side Effects and Notes):
- Hypotension
- Dizziness
- QT prolongation
- Dysrhythmias
- Drowsiness
- Rash
- Urinary Retention
- Diarrhea
- Headache
- Anaphylaxis
- Flushing

Ondansetron may cause QT prolongation in dose dependent manner, consider EKG monitoring or withholding in patients with long QT or at risk. Patients that do not respond to initial dose often do not respond to subsequent doses.

Administration:
ADULT DOSE
4mg SLOW IV push over 1min - (rapid administration may result in syncope)
4mg IM or PO (oral disintegrating tablet - ODT)
May repeat PO every 20 min to a total of 12 mg

PEDIATRIC DOSE <34 kg – base physician order only
4 mg SLOW IV push over 1 min - (rapid administration may result in syncope)
4 mg IM or PO (oral disintegrating tablet - ODT)
Repeat per base physician order

Onset:

<table>
<thead>
<tr>
<th>Route</th>
<th>Onset</th>
<th>Peak</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>P.O., I.V.</td>
<td>Rapid</td>
<td>15-30 min</td>
<td>4-8 hr</td>
</tr>
<tr>
<td>I.M.</td>
<td>Rapid</td>
<td>40 min</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

Duration: 4-8 hours
OXYGEN

Classification: Elemental gas (room air contains 21% oxygen)

Actions:
1. Oxidizes glucose to provide cellular energy
2. Essential for normal aerobic metabolism

Indications:
1. Patients who have oxygen saturations ≥ 94% without signs or symptoms of hypoxia or impending respiratory compromise should not receive O2
2. When applying O2 use the simplest method to maintain O2 Sat ≥ 94%
3. Do not withhold O2 if patient is in extremis

Contraindications: No absolute contraindications exist in the field

Administration:
- Cannula: 2 to 6 L/min (25-40% concentration)
- Mask: 10 to 15 L/min (50-60% concentration)
- NRB Mask: 10 to 15 L/min (90-95% concentration)
- BVM with reservoir: 15 L/min (40-90% concentration)
- ET with BVM: 15 L/min (100% concentration)
- Nebulizer: 10 L/min

Onset: 1-2 minutes
Duration: Up to 30 minutes

Notes:
- Never use an oxygen-powered ventilation device with an ET tube or with pediatric patients. This produces high pressure, which may result in a pneumothorax and/or gastric distension.
- Never withhold oxygen from a patient in respiratory distress. Use caution with COPD patients who have a chief complaint other than respiratory distress. In the COPD patient, hypoxic drive may be their stimulus to breathe. If respiratory depression occurs, support ventilations with 100% oxygen via BVM.
PRALIDOXIME (2-PAM Chloride)
(For Prehospital Personnel Use Only)

Classification: Nerve agent antidote

Actions:
1. Antidote to cholinesterase inhibitors
2. Antidote to organophosphate nerve agents or pesticides

Indications: In the event of exposure or suspected exposure to (base on symptomatology) to nerve agents.

Contraindications: No symptoms present

Adverse Effects:
- Neurological
  - Blurred or double vision
  - Difficulty speaking
  - Rapid breathing
  - Muscle stiffness or weakness
  - Headache
  - Nausea
- Cardiac
  - Tachycardia

Administration: ADULT DOSE (self administration)
1. Mild Signs: MARK I auto-injector antidote kit, 1 dose initially, may repeat once in 10 minutes, not to exceed 2 doses
2. Moderate Signs: MARK I auto-injector antidote kit, 1 dose initially, may repeat once in 10 minutes, not to exceed 2 doses
3. Severe Signs: MARK I auto-injector antidote kit, 3 doses initially

Onset: Variable

Duration: Variable

Notes:
- See Weapons of Mass Destruction Section for complete instructions for nerve agent exposure.
- Monitor for signs and symptoms of exposure that include; salivation, lacrimation, urination, defecation, GI irritation, eye constriction, bradycardia and hypotension.
- Further treatment based on base station orders
SODIUM BICARBONATE
(Base Hospital Order Only)

Classification: Alkalinizing agent

Actions:
1. Combines with hydrogen ions to form carbonic acid (H2CO3) which breaks down into H2O+CO2
2. Increases blood pH

Indications:
1. Prolonged resuscitation not responding to hyperventilation, oxygenation, defibrillation, and first-line medications.
2. If used for cardiac arrest, Sodium Bicarbonate should not be given until all other more effective interventions, such as defibrillation, effective cardiac compressions, positive pressure ventilation via the ET tube, and pharmacological therapies, including Epinephrine and anti-arrhythmic have been employed.
3. Consider in suspected tricyclic overdoses with signs of tachycardia and QRS widening (>0.1 seconds) on the EKG.
4. Consider in hyperkalemia with EKG changes refractory to Calcium Chloride.

Contraindications: Metabolic and/or respiratory alkalosis

Adverse Effects:
Metabolic
- Hypernatremia
- Hyperosmolarity
- Hyperkalemia
- Metabolic alkalosis

Administration:

**ADULT DOSE**
1 mEq/kg IVP/IO, may repeat every 10 minutes at ½ the initial dose

**PEDIATRIC DOSE**
1 mEq/kg IVP/IO

Onset: Immediate

Duration: Dependent upon the degree of acid-base imbalance

Notes:
- Causes Calcium Chloride to precipitate and inactivates catecholamines. Flush IV tubing before and after administration.
- Adequate alveolar ventilation is the mainstay in the control of acid-base balance in cardiac arrest.