Appendix 2

Drug Manual

This manual contains basic pharmacological information on the medications listed throughout this Protocol Manual. The dosages listed in this section are the recommendations of the manufacturers or the textbooks from which the information was gathered. When administering a medication, follow the recommended dose schedule as specified in the Protocol under which you are currently treating.

Adenosine
(Adenocard)

Therapeutic Effects:

- Converts PSVT to slower rate by slowing conduction through the A-V node, also works when PSVT is caused by W-P-W.

Indications:

- Paroxysmal Supraventricular Tachycardia
- Ventricular Tachycardia

Contraindications:

- 2nd and 3rd degree heart blocks
- Sick Sinus Syndrome.
- Known hypersensitivity to Adenocard
- WPW or accessory pathway cardiac condition conduction abnormalities

Adverse Reactions:

- Facial Flushing
- Nausea

Administration and Dosage:

- **Adults:**
  - 6 mg very rapid IVP, followed without delay by a very rapid 20 ml saline bolus.
  - A second dose of 12 mg very rapid IVP, followed without delay by a very rapid 20 ml saline bolus may be given, 12 mg. dose very rapid IVP, followed without delay by a very rapid 20 ml saline bolus, may be repeated once if needed. Max dose 30 mg.

- **Pediatric:**
  - 0.1 mg / kg (max 6mg) very rapid IVP, followed without delay by a very rapid 20 ml saline bolus.
  - Second dose of 0.2 mg / kg (max 12mg) very rapid IVP, followed without delay by a very rapid 20ml saline bolus.

NOTE:

Adenosine should be given in the port closest to the IV site. The syringe with the saline bolus should already be in the next most distal port.

Albuterol
(Proventil, Proventil Syrup, Ventolin)

Therapeutic Effects:

- Relaxes bronchial smooth muscle by acting on beta adrenergic receptors.

Indications:

- Bronchospasms, in patients with reversible obstructive airway disease.
- Airway Management, Allergic Reaction, Anaphylaxis, Asthma, Carbon Monoxide Inhalation, COPD, Sickle Cell Anemia.

Contraindications:

- Use cautiously in patients with cardiovascular disorders, including coronary insufficiency and hypertension.
- Also use caution in patients with hyperthyroidism or diabetes mellitus.
- Warn patient about the possibility of paradoxical bronchospasm. If this occurs, the drug should be discontinued immediately.

Adverse Reactions:

- CNS: Tremor, nervousness, dizziness, insomnia, headache
- CV: Tachycardia, palpitations, hypertension
- EENT: Drying and irritation of nose and throat (with inhaled form)
- GI: Heartburn, nausea, vomiting
- Other: Muscle cramping

Precautions:

- Propranolol and other beta-blockers block the bronchodilation effect of albuterol. Monitor patient carefully.

Administration and Dosage:

- AEROSOL - Adults and pediatric: 2.5 mg in 3.0 ml of premix as individual protocol dictates.

NOTES:

Albuterol can be combined with Atrovent in the nebulizer. This may be administered (as needed) before vascular access.

Amiodarone (Cordarone)

DOSAGE

Adult:

Atrial Fib: 150 mg IV/IO in 100 ml NS over 10 minutes. Single dose only.
VT with pulse (stable) and SVT: 150 mg IV/IO in 100 ml NS over 10 minutes. (10 ml/min or 100 gtt/min using 10 gtt set) May repeat every 10 minutes PRN.
VF and pulseless VT: 300 mg IV/IO over 30 seconds. May repeat once 150 mg IV/IO over 30 seconds.

Pediatric:

VT with a pulse: 5 mg/kg in 30 ml NS / IV/IO over 30 minutes. (1 ml/min or 60 gtt/min)
VF and pulseless VT: 5 mg/kg IV/IO in 30 seconds – max dose 300 mg.

How to mix:
150mg or pediatric appropriate amount of medication in Soluset with NS. Use a 10gtts/ml (macro) set for adults and a 60 gtts/ml (micro) set for pediatrics.

ACTIONS

Amiodarone blocks sodium channels at rapid pacing frequencies and exerts a non-competitive antisympathetic action. One of its main effects, with prolonged administration, is to lengthen the cardiac action potential. In addition, it produces a negative chronotropic effect in nodal tissues. Amiodarone also blocks potassium channels, which contributes to slowing of conduction and prolongation of refractoriness. Its vasodilatory action can decrease cardiac workload and consequently myocardial consumption.

INDICATIONS

Indicated for initiation of treatment and prophylaxis of frequently recurring ventricular fibrillation, atrial fibrillation and hemodynamically unstable ventricular tachycardia in patient refractory to other therapy. Amiodarone may also be used to treat supraventricular tachycardia.

CONTRAINDICATIONS

Contraindicated in patients with known hypersensitivity to Amiodarone, or in patients with cardiogenic shock, marked sinus bradycardia, and second or third degree AV block. Contraindicated in patients with iodine hypersensitivity.

WARNINGS

May worsen existing or precipitate new dysrhythmia's, including torsades de pointes, and VF. Use with beta-blocking agents could increase risk of hypotension and bradycardia. Amiodarone inhibits atrioventricular conduction and decreases myocardial contractility, increasing the risk of AV block with verapamil or diltiazem or of hypotension with any calcium channel blocker. Use with caution with pregnancy and with nursing mothers.

SIDE EFFECTS

Adverse reactions include fever, bradycardia, CHF, cardiac arrest, hypotension, ventricular tachycardia, nausea, and abnormal liver function.

Aspirin

Therapeutic Effects:

- Inhibits platelet aggregation and thereby reduces thrombus formation.

Indications:

- Acute chest pain related to myocardial ischemia

Contraindications:

- Hypersensitivity to Aspirin
- Current GI Bleeding
- Multi-system Trauma
- Pregnancy
- Pt who has taken Aspirin within 4 hours

Adverse Reactions:

- Dyspepsia
- Rash
- Anaphylaxis

Administration and Dosage:

- **Adult:**
  - 81mg x4 chewable tablets

Atropine

Therapeutic Effects:

- Atropine sulfate is a parasympatholytic drug that enhances both sinus node automaticity and atrioventricular (AV) conduction.

Indications:

- Symptomatic bradycardia
- Bradycardic PEA
- Pediatric RSI
- Organophosphate exposure, Nerve Agent exposure

Contraindications:

- Atrial fibrillation
- Atrial flutter
- Glaucoma
- Use with caution in the presence of myocardial ischemia / infarction

Adverse Reactions:

- Ventricular irritability, Tachycardia, Hypertension, Hypotension, Angina
- Atrial or ventricular fibrillation, Paradoxical bradycardia
- Thickening of bronchial mucus
- Increased intra-ocular pressure

Administration and Dosage:

- **Adults:**
  - For pulse producing symptomatic bradycardia, atropine is given 1.0 mg IV every 3 - 5 minutes to a maximum of 3 mg.
  - Maximum dosage is 3 mg.
  - For Organophosphate or Nerve Agent exposure, >10 yrs. 2 mg via Auto Injector pen (green) x 1 for mild symptoms, x 2 pens for moderate symptoms, x 3 pens for severe symptoms.

- **Pediatric:**
  - Atropine dosage is given 0.02 mg/kg IV/IO/ET. May repeat once up to a maximum total dose of 0.04 mg / kg.
  - For Organophosphate or Nerve Agent exposure, 4 to 10 yrs. 1 mg via Auto Injector pen (dark red) x 1 for mild symptoms, x 2 pens for moderate symptoms, x 3 pens for severe symptoms.
  - For Organophosphate or Nerve Agent exposure, 6months to 4 yrs. 0.5 mg via Auto Injector pen (blue) x 1 for mild symptoms, x 2 pens for moderate symptoms, x 3 pens for severe symptoms.
  - Atropine is given 0.02 mg/kg IV/IO for rapid sequence intubation of patients under 5 years of age.

NOTE:

Never administer less than 0.1 mg of Atropine for any patient. Neonates and most children under 1 month of age would receive < 0.1mg of Atropine and therefore should not receive Atropine. Studies show that ET administration of medications is generally ineffective in both adults and children but still remains in the most recent PALS and ACLS manual

Atrovent

Therapeutic Effects:

- Bronchodilation, works synergistically with Albuterol

Indications:

- Bronchospasms including asthma, and COPD

Contraindications:

- Known hypersensitivity to medication or soybeans / peanuts

Adverse Reactions:

- Drying of mucous membranes
- Decreased GI motility
- Exacerbation of narrow angle glaucoma

Administration and Dosage:

- 0.5 mg nebulized single dose only.
- May be mixed with Albuterol.
- May administer one inhaled metered dose if the patient has an Atrovent inhaler and has not recently self-medicated.

Calcium Chloride

Therapeutic Effects:

- Increases myocardial contractile function.

Indications:

- Should only be used during resuscitation in the treatment of acute hyperkalemia (dialysis patients), hypocalcemia, or calcium channel blocker toxicity.

Contraindications:

- If the heart is beating, rapid administration of calcium can produce slowing of the cardiac rate.
- Calcium must be used cautiously in the digitalized patient because it increases ventricular irritability and may precipitate digitalis toxicity.
- In the presence of sodium bicarbonate, calcium salts will precipitate as carbonates. As a result, these drugs cannot be administered together.
- Calcium may produce vasospasm in coronary and cerebral arteries

Adverse Reactions:

- May increase or decrease systemic vascular resistance.
- The high level of calcium in the blood inducted by the administration of calcium salts may induce reperfusion injury and may adversely affect the neurologic outcome of the patient.

Administration and Dosage:

- A 10 ml pre-filled syringe or ampule of 10% solution of calcium chloride contains 1-gram Calcium Chloride (100 mg = 1 ml).

- **Adult**
  - 10ml = 1gram

- **Pediatric**
  - 0.2 ml/kg = 20mg/kg

Dextrose

Therapeutic Effects:

- Will restore circulating blood sugar level to normal in states of hypoglycemia. Acts transiently as an osmotic diuretic.

Indications:

- To treat coma caused by hypoglycemia.
- To treat symptomatic hypoglycemia or if glucose < 60 mg/dl on glucometer.

Contraindications:

- Intracranial hemorrhage

Adverse Reactions:

- May precipitate severe neurologic symptoms in alcoholics.
- Will cause tissue necrosis if it infiltrates; therefore, it should only be given through a good, rapidly flowing IV line.

How Supplied:

- D10 in 100ml or 250ml

Administration and Dosage:

- If possible, draw blood for serum glucose determinations before administering the dextrose.

- **Adults:**
  - D10 100ml or 250ml IV/IO if glucose is < 60 mg. Infuse until mental status returns to baseline.

- **Pediatrics:**
  - D10 100ml or 250ml IV/IO if glucose is < 60 mg. Infuse until mental status returns to baseline.

Diazepam
(Valium)

Therapeutic Effects:

- Through its depressant action on the CNS, it can terminate some seizures, and it has a calming effect on anxiety.

Indications:

- To treat status epilepticus.
- In selected circumstances, to relieve severe emotional distress.
- Given as a sedative prior to cardioversion or pacing in conscious patients.

Contraindications:

- Should only be used for pregnant women experiencing seizures and not for other distresses because of the possible toxic effect it may have on the fetus.
- Should not be given to patients who have taken alcohol or other sedative drugs.
- Should not be given to patients with respiratory depression from any source.
- Should not be given to patients with hypotension.

Adverse Reactions:

- Possible hypotension
- Confusion, stupor.
- In some patients, especially the elderly, the very ill, and those with pulmonary disease, may cause respiratory arrest and / or cardiac arrest.

How Supplied:

- Pre-filled syringes and ampules of 2 ml and in vials of 10 ml, in a concentration of 5 mg / ml

Administration and Dosage:

- **Adult:**
  - For seizure activity administer 5mg IV increments, maximum dose 10 mg.
  - For severe anxiety that must be treated in the field, after consultation with medical control, administer intramuscularly at 2-5 mg IM.
  - For sedation prior to cardioversion or pacing administer 5-10 mg IV max dose 10 mg.

- **Pediatric:**
  - Broslow Tape dosage may be used or 0.1 mg / kg IV / IO

Diltiazem
(Cardizem)

Therapeutic Effects:

- Slows heart rate in tachyarrhythmia by blocking the slow calcium channels in the myocardium.

Indications:

- Symptomatic A-Fib or A-Flutter with a rapid ventricular rate (150)

Contraindications:

- Known hypersensitivity
- Administration of IV beta-blockers within 30 minutes
- Systolic blood pressure less than 90 mm / Hg
- WPW or accessory pathway cardiac conduction abnormalities
- Heart block and sick sinus syndrome
- Ventricular Tachycardia

Adverse Reactions:

- Hypotension
- Heart blocks

Administration and Dosage:

- 0.25 mg / kg IV slow IV push over 2 minutes up to a max. dose of 25 mg

Diphenhydramine
(Benadryl)

Therapeutic Effects:

- Blocks histamine effects in allergic reactions.
- Sedative
- Reverses untoward effects of some phenothiazine tranquilizers.
- Inhibits motion sickness (antiemetic).

Indications:

- As an adjunct to epinephrine in the treatment of anaphylactic shock and severe allergic reactions.
- To treat extrapyramidal reactions caused by some antipsychotic medications.

Contraindications:

- Narrow angle (acute) glaucoma
- Prostate enlargement
- Ulcer disease with symptoms of obstruction

Adverse Reactions:

- Drowsiness, confusion
- Blurring of vision
- Difficulty in urination (especially older men)
- Dry mouth
- Wheezing; thickening of bronchial secretions

How Supplied:

- In vials of 10 or 30 ml containing 10 mg/ml
- In vials of 10 ml containing 50 mg/ml
- In ampules of 1 ml containing 50 mg/ml
- In prefilled syringes containing 50 mg in 1 ml

Administration and Dosage:

- For most purposes, diphenhydramine can be given by intramuscular injection.

- **Adults:**
  - 0.5mg/kg IV/IM, Maximum dose 50 mg

- **Pediatric:**
  - 0.5 mg/kg IV/IM, Maximum dose 50 mg

Dopamine

Therapeutic Effects:

- Stimulates the release of norepinephrine and increases myocardial work without significantly increasing coronary blood flow in a compensatory manner.

Indications:

- Hemodynamically significant hypotension in the absence of hypovolemia

Contraindications:

- Dopamine will increase heart rate and may induce or exacerbate supraventricular and ventricular dysrhythmias and myocardial ischemia.

Adverse Reactions:

- Nausea and vomiting
- Exacerbated myocardial ischemic

Administration and Dosage:

- **Adults:**
  - Is available for intravenous use only. The contents of 2 ampules (200 mg / ampule) should be mixed in 250 ml of NS. This yields a concentration of 1,600 mcg / ml. The initial rate of infusion is 5 mcg / kg / min (maximum rate is 20mcg/kg/min). This rate may be increased until blood pressure, urine output, and other parameters of organ perfusion improve. The lowest infusion rate that results in satisfactory hemodynamic performance should be used to minimize side effects. Monitoring central hemodynamics is essential for proper use of Dopamine in patients who have ischemic heart disease or congestive heart failure and should be instituted prior to or as soon as possible after the initiation of treatment.
  - ROSC after Cardiac Arrest: 10-20 mcg/kg/min to keep SBP >140 or MAP 80-90.
  - Cardiogenic Shock: 5-20 mcg/kg/min for hypotension not corrected by fluid challenge.
  - Can be administered with physician's orders for Traumatic Shock.
  - Symptomatic Bradycardia: 5-20 mcg/kg/min

- **Pediatrics:**
  - Only with physician's orders. Administer dopamine 5-20 mcg/kg/min for Neurogenic Shock after volume replacement. Titrate dopamine to maintain a SBP >90.

- **Street rule:**
  - Take patient's weight in pounds, drop last digit and subtract one. Starting the infusion at this drip rate administers 5 mcg/kg/min.

Duodote

Therapeutic Effects:
DuoDote is an auto-injector containing Atropine and Pralidoxime Chloride. Atropine's ability to block acetylcholine receptors reduce respiratory secretions, relieve airway constriction, and may reduce respiratory paralysis. Pralidoxime reactivates the enzyme acetylcholinesterase, which allows acetylcholine to be degraded, thus relieving the parasympathetic over-stimulation (cholinergic crisis) caused by excess acetylcholine. Pralidoxime potentiates the effect of Atropine, and their ability to reduce respiratory paralysis is significantly improved when the two medications are administered together.

Indications:
- Organophosphate poisoning
- Nerve agent exposure

Contraindications:
- Hypersensitivity (rare)

Precautions:
- None

Adverse Reactions:
- Cardiac dysrhythmias, especially tachycardias
- Hypertension
- Hyperventilation
- Muscle weakness
- Nausea

How Supplied:

- Pre-filled syringes and ampules of 2 ml and in vials of 10 ml, in a concentration of 5 mg / ml

Administration and Dosage:

ADULT / PEDIATRIC:
- Mild symptoms, including dyspnea, increased secretions, chest tightness, nausea, vomiting, and cardiac dysrhythmias: One auto-injector = Atropine 2.0 mg and Pralidoxime 600 mg IM. If patient condition stabilizes, no additional doses are necessary; if patient's symptoms progress to include severe symptoms below, administer two additional auto-injectors.
- Severe symptoms, including copious secretions, severe dyspnea, involuntary urination/defecation, convulsions, altered mental status or unconsciousness: Administer three auto-injectors; consider anticonvulsants

Epinephrine

Therapeutic Effects:

- Increased systemic vascular resistance
- Increased arterial blood pressure
- Increased heart rate
- Increased coronary and cerebral blood blow
- Increased myocardial contraction
- Increased myocardial oxygen requirements
- Increase automaticity
- Decrease bronchospasm

Indications:

- Cardiopulmonary arrest, severe asthma, anaphylactic reactions, and allergic reactions

Contraindications:

- Allergy to sulfites
- Minor allergic reactions (urticaria)
- In patients with coronary artery disease, angina, or palpitations

Precautions:

- In patients who are receiving digitalis, Epinephrine can induce or exacerbate ventricular ectopy.
- Can produce hypertension in patients who are not receiving CPR

Administration and Dosage:

- **Adult:**
  - Given IVP/IO/ET every 3-5 min.
  - SQ dose is 0.3 - 0.5 mg of 1:1,000 concentration
  - Anaphylaxis:
    - 1:1,000 0.3 mg SQ for moderate respiratory compromise
    - 0 .1 mg 1: 10,000 IV. Repeat as needed to a maximum of 0.5 mg for extreme respiratory compromise (complete or almost complete airway obstruction) or profound hypotension
  - Asthma
    - Consider 1:10,000 0.1mg IVP for extreme respiratory compromise
    - Additional Epinephrine doses IV only with physician orders. Epinephrine is 1:1,000 0.1 mg SQ for extreme respiratory compromise.
  - Cardiopulmonary Arrest
    - 1:10,000 1mg IV. Repeat as needed every 3 - 5 minutes

- **Pediatrics:**
  - Initial dose in the pulseless patient is 0.01 mg / kg 1:10,000 IV/IO
  - For true anaphylaxis, 0.01 mg / kg (1:10,000) IV / IO
  - Asthma 1:1,000 SQ 0.01 mg/kg for severe asthma not improving with Albuterol
  - Additional Epinephrine as needed per online medical control.

Fentanyl

Therapeutic Effect

- A potent anesthetic and analgesic often used for pain management in operating rooms and for analgesia, deep sedation in intensive care units, emergency departments, and in EMS.
- Fentanyl has a very rapid onset of action, resulting in near-immediate sedation and analgesia.

Indications

- For sedation prior to intubation if Etomidate and Versed are not available.
- For deep sedation to facilitate intubation if Succinylcholine and Etomidate are not available.
- For severe pain resulting from significant musculoskeletal injuries and burns.

Contraindications

- Known hypersensitivity

Adverse Reactions

- Narcosis/deep sedation with higher doses. This is desirable, however, for sedation prior to intubation.
- Hypotension – much less common than with other opioid medications such as Morphine.
- Rigid Chest Wall
- Nausea/vomiting
- Confusion
- Respiratory depression with higher doses.

Administration and Dosage

- **Adults:**

  <u>Sedation for RSI if Etomidate and Versed are not available</u>
  - 100-300mcg IV/IO (3mcg/kg max dose)

  <u>Anesthesia to facilitate intubation if Succinylcholine and Etomidate are not available</u>
  - 100-300mcg IV/IO
  - May repeat X ½ dose if inadequately sedated for the purpose of intubation.

  <u>Anesthesia to facilitate intubation if Succinylcholine is not available</u>
  - Use Etomidate only

  <u>For pain management (fractures, burns)</u>
  - 1 mcg/kg IV/IO/IM
  - 1-2 mcg/kg IN if unable to establish and IV/IO.

Fentanyl (cont.)

- **Pediatrics:**

  Sedation for RSI if Etomidate and Versed are not available
  - 1mcg/kg IV/IO

  Anesthesia to facilitate intubation if Succinylcholine and Etomidate are not available
  - 1mcg/kg IV/IO
  - May repeat dos X 1 if necessary, for adequate sedation

  For pain management (fractures, burns)
  - 1mcg/kg IV/IO
  - 1-2mcg/kg IN if unable to establish IV/IO

Supplied
- 250 mcg/5mL vial or 100 mcg/2mL vial

Route
- IV/IO/IM/IN

Monitoring
- *Nasal capnography
- Pulse oximetry monitoring

*If available and approved by the Medical Director

Etomidate

Therapeutic Effects:

- Etomidate is a hypnotic drug without analgesic activity. Intravenous injection of Etomidate produces hypnosis characterized by a rapid onset of action, usually within one minute. Duration of hypnosis is dose dependent but relatively brief, usually three to five minutes when an average dose of 0.3 mg / kg is used.

Indications:

- Etomidate is indicated by intravenous injection for sedation.
- May be used as a sedative for cardioversion.
- It is especially helpful as a sedative for RSI intubation in the hemodynamically unstable patient in that it has minimal cardiovascular effects.

Contraindications:

- Etomidate is contraindicated in patients who have shown hypersensitivity to it.

Precautions:

- Do not administer unless solution is clear and container is undamaged. Etomidate should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus. Use is not recommended in obstetrics.

Adverse Reactions:

- The most frequent adverse reaction is skeletal muscle movements. Most movements are bilateral. Hyperventilation, hypoventilation, and apnea of short duration (5 to 90 seconds) with spontaneous recovery can occur. Hypertension, hypotension, tachycardia, bradycardia, and other arrhythmias have occasionally been observed.

Overdosage:

- Overdose may occur from too rapid or repeated injections. A drop in blood pressure may follow too rapid injection.

Administration and Dosage:

- **Adult**
  - RSI - Initial dose is 0.3 mg/kg injected over a period of 30 to 60 seconds. Max dosage 40 mg
  - For sedation prior to cardioversion: 5-10mg IV max dose 10 mg.

- **Pediatric**
  - Initial dose is 0.15-0.3 mg/kg injected over a period of 30 to 60 seconds.

Furosemide
(Lasix)

Therapeutic Effects:

- Acts as a potent, rapidly acting diuretic that inhibits re-absorption of sodium and chloride in the ascending loop of Henle.

Indications:

- Indicated for the emergency treatment of pulmonary congestion associated with left ventricular dysfunction.

Contraindications:

- In patients with acute myocardial infarction and other disease states associated with abnormal left ventricular compliance, diuretics must be used cautiously since small changes in volume may induce large changes in left ventricular pressure. This may reduce cardiac coronary perfusion. Because the effects of diuretics on preload are synergistic with those of morphine and nitrates, combination therapy should be used with caution.

Adverse Reactions:

- Dehydration and hypotension can result.
- Hyperosmolarity and metabolic alkalosis can occur
- Furosemide is a sulfonamide derivative and may induce allergic reactions in patients with sensitivity to sulfonamide

Administration and Dosage:

- **Adults:**
  - Lasix 40 mg IV if patient is not taking Lasix and not improving with Nitro.
  - Lasix two times the usual daily dose if patient takes Lasix/Bumex (40 mg Lasix equals 1 mg Bumex).
  - It should be injected slowly over a period of at least 1 to 2 minutes

NOTE:

Not to be given to febrile patient with signs and symptoms such as rales and shortness of breath may also be present with pneumonia. Maximum dose of Lasix 80 mg.

Glucagon

Therapeutic Effects:

- Raises blood glucose levels by promoting catalytic depolymerization of hepatic glycogen to glucose.

Indications:

- Obtundation from insulin-shock when an IV cannot be initiated in order to give dextrose.

Contraindications:

- Unstable diabetics usually do not respond to glucagon. Give Dextrose IV instead
- It is vital to arouse the patient from coma as quickly as possible and to give additional carbohydrates orally to prevent secondary Hypoglycemic reactions
- For IV drip infusion, glucagon is compatible with Dextrose solution, but forms a precipitate in Chloride solutions
- Has a positive inotropic and chronotropic reaction on the heart. May be used to treat overdose of beta-adrenergic blockers.

Administration and Dosage:

- **Adults:**
  - 1 mg SQ or IM, may repeat within 25 min, if necessary. When patient responds, give additional carbohydrates as soon as possible.
- **Pediatrics:**
  - 0.5 mg SQ or IM for patients < 20 kg
  - 1 mg SQ or IM for patients > 20 kg

Hydroxocobalamin
(Cyanokit)

Therapeutic Effects:

Cyanokit (hydroxocobalamin) has a high affinity for cyanide ions and is converted to cyanocobalamin (vitamin B12). B12 is a water-soluble vitamin that binds with cyanide and then is removed from the circulation by the kidneys and is excreted in the urine.

Indications:

- Cyanokit is indicated for the treatment of known or suspected cyanide poisoning. Cyanide poisoning may result from inhalation, ingestion, or dermal exposure to various cyanide containing compounds, including smoke from closed-space fires (smoke inhalation).
- Haz-mat and terrorist incidents involving cyanide

Contraindications:

- None

Adverse Reactions:

- Chromaturia (red urine)
- Erythema (skin redness), rash
- Increased blood pressure, headache
- Nausea/vomiting, diarrhea

Administration and Dosage:

  - IV infusion through a dedicated IV line.
- After reconstitution, each vial contains 25 mg/ml
- **Adult:**
  - 5gms (two 2.5 gm vials) over 15 minutes
- **Pediatric:**
  - 70 mg/kg (max 5 gms)

Ketamine
(Ketamine Hydrochloride)

Therapeutic Effects:

- Ketamine is a rapid-acting, general anesthetic producing an anesthetic state characterized by profound analgesia, normal pharyngeal and laryngeal reflexes, normal or slightly enhanced skeletal muscle tone, and cardiovascular and respiratory stimulation.

Indications:

- Severely agitated patient that poses an immediate threat to himself/herself or others and usual chemical or physical restraints may not be appropriate or safely used.

Contraindications:

- Combative patient with agitated delirium commonly will be tachycardic and hypertensive. However, it should be noted that Ketamine is a relative contraindication in patients with any condition in which a significant elevation of blood pressure would be hazardous such as:
    - severe cardiovascular disease,
    - heart failure,
    - severe or poorly controlled hypertension,
    - recent myocardial infarction,
    - history of stroke,
    - cerebral trauma,
    - intracerebral mass or hemorrhage.
- The benefit of administering Ketamine to the combative patient with agitated delirium generally outweighs the risks.
- Contraindicated if the patient is hypersensitive to the drug.

Adverse Reactions:

- Psychological manifestations varying in severity between pleasant dream-like states, vivid imagery, hallucinations, nightmares or illusions. Although delirium has been reported.
- Diplopia,
- Nystagmus,
- Blood pressure and pulse rate elevations,
- Local pain,
- Exanthema at the injection site.

Precautions:

- Use with caution in the chronic alcoholic and the acutely alcohol intoxicated patient.
- The intravenous dose should be administered over a period of 60 seconds.
- Resuscitative equipment should be ready for use.
- Although respiratory depression is not a common concern with low dose Ketamine administered IM, as with other sedatives, resuscitative equipment should be ready for use.

Administration and Dosage:

Dosage: 2 mg/kg IM. Maximum per dose 200 mg. May repeat times one if uncontrollable agitation persists
DO NOT attempt to place an IV in a severely combative patient.

Lidocaine

Therapeutic Effects:

- Suppresses ventricular dysrhythmia
- Suppresses ventricular ectopy after acute myocardial infarction

Indications:

- Suppression of ventricular ectopy, including ventricular tachycardia and ventricular fibrillation, as well as premature ventricular complexes in critically ill patients, especially those with acute ischemic heart disease.
- It can be given to the head injured patient that will receive RSI.

Contraindications:

- Known allergy to Lidocaine
- Bradycardia with PVC's

Precautions:

- Known or suspected Lidocaine toxicity
- Patients with recent cocaine abuse
- 70 years of age and older
- Hepatic dysfunction

Adverse Reactions:

- Clinical indicators of Lidocaine toxicity include drowsiness, disorientation, decreased hearing ability, paresthesia, and muscle twitching.
- Some patients may become very agitated.
- More serious toxic effects include focal and grand mal seizures.

Administration and Dosage:

- **Adults:**
  - For VF / VT: ~~1~~–1.5 mg / kg IV repeat in 3-5 minutes to total dose of 3 mg / kg
  - For VT: 1.5mg/kg IV. Repeat 0.75mg/kg every 5 minutes as needed to maximum of 3 mg/kg.
  - Lidocaine drips should be initiated after treating these potentially lethal arrhythmias at 2 to 4 mg / min.

- **Pediatrics:**
  - 1mg/kg IV. Repeat Lidocaine 1mg/kg IV as needed every 3-5 minutes to a maximum dose 3mg/kg. Follow bolus therapy with maintenance infusion of 20-50mcg/kg/min

NOTES:

300 mg of Lidocaine into 250ml of NS yields 1 micro-drop/kg/minute = 20mcg/kg/min

Magnesium Sulfate

Therapeutic Effects

- Magnesium, the second most plentiful cation in the intracellular fluids, has been linked to three important effects on heart cells.
  - First - magnesium increases the stability of cardiac cells.
  - Second - magnesium is directly related to the transportation of potassium ions into the cardiac cells.
  - Third - magnesium can act as a functional calcium channel blocking agent.
  - Magnesium is also a skeletal muscle and CNS depressant.

Indications

- Ventricular fibrillation and tachycardia refractory to Lidocaine and Amiodarone
- Unstable or pulseless ventricular tachycardia with Torsades de Pointes refractory to defibrillation
- Eclampsia and pre-eclampsia immediately pre-partum or post-partum in patient not having seizure history

Contraindications

- Should not be administered parenterally in patients with heart block.

Precautions

- Magnesium may cause respiratory depression through its CNS depressant effects.
- Magnesium can cause fetal harm when administered to pregnant women except in the cases of a toxicmother.
- Use caution if administering with other CNS depressant medications due to the additive effects they mayhave with magnesium.
- Use caution in patients with renal impairment as magnesium is excreted primarily with the kidneys.

How Supplied

- Magnesium Sulfate must be diluted before it is administered. If it is dispensed in a 50% solution (1g/2mL), it must be diluted to a 20% solution. A simple way to do this is to add 3mL of saline for every 1g administered. For example, the first dose given in V-Fib is 2g. Draw up 6mLof saline, then add the contents of 2 vials, whichwill yield 2g/4mL. There should be a total of 10 mL in the syringe containing 2g of Magnesium Sulfate.

Administration and Dosage

- Torsades de Pointes-magnesium 2 grams IV, IO, IM in 100mL NS over 2-3 mins. 2 vials = 2 grams
- For Eclamptic seizures: 2g IV diluted in 20mL NS given over 20-30 minutes (rapid infusion can lead to cardiac arrest) with physician order only

*If available and approved by the Medical Director

Metoprolol
(Lopressor)

Therapeutic Effects:

- In the setting of a myocardial infarction it blocks Beta 1 receptors on the myocardium slowing the heart rate and decreasing myocardial oxygen demand.

Indications:

- Myocardial infarction evidenced by ECG changes indicated by ST segment elevations in 2 contiguous leads with heart rate greater than 60 BPM and systolic blood pressure greater than 120.

Contraindications:

- Active Bronchospasm / wheezing
- Systolic blood pressure < 120 mmHg
- Concurrent calcium channel blocker use (not to be used IV within 30 minutes of each other)

Precautions:

- Use cautiously in patients with history of congestive heart failure and asthma.

Adverse Reactions:

- Bronchospasm
- Hypotension
- Bradycardia
- Heart block

Administration and Dosage:

- **Adults:**
  - 5 mg IVP.
  - Repeat dose once if indicated (HR >60 and SBP >120)

Midazolam
(Versed)

Therapeutic Effects:
Versed is a potent, short-acting Benzodiazepine with strong anti-seizure, hypnotic and amnesic properties. It is widely used as a sedative prior to cardioversion. Versed is 3-4 times more potent than Valium, with a 1-5 minute onset of action when administered intravenously, and 15 minutes when administered intramuscularly. Versed has impressive amnesic properties making it the drug of choice for conscious sedation. Like all Benzodiazepine class drugs, Versed is a central nervous system depressant.

Indications:
o Primary benzodiazepine for seizure control and pharmacological restraint.
o Conscious sedation of patients prior to short-term invasive procedures (cardioversion, etc.)
o Alternative to Etomidate, Ativan, and Diprivan in DAI guideline.

Contraindications:
o Hypersensitivity to the drug
o Narrow-angle glaucoma
o Obstetrical patients in the last few weeks of pregnancy

Precautions:
o A slight to moderate decrease in mean arterial pressure, cardiac output, systemic vascular resistance and heart rate may be seen
o Lower dosages should be considered in patients that are debilitated or chronically ill

Adverse Reactions:
o Respiratory depression
o Laryngospasm
o Bronchospasm
o Respiratory depressant effects are more pronounced when patient has ingested alcohol or other CNS depressant agents
o Hypotension secondary to histamine release (treated with IV fluids / Benadryl)

Administration and Dosage:
ADULT:
o Conscious Sedation: 2 mg slow IV push, repeat as necessary in boluses of 0.5–2 mgs, titrated to the desired level of sedation, not to exceed a total dosage of 5mgs IV
o Seizures 2 – 5 mgs IV, IO, IN, IM
o NOTE: You may dilute 5mg of Versed in 9cc of saline to result in a 0.5mg/cc concentration for IV administration.

PEDIATRIC:

- Administer Versed 0.05 mg / kg IV/IO, maximum single dose of 1mg may repeat one time (maximum combined dose of 2mg), IM or intranasal if no IV/IO access is available 0.1mg/kg, repeat one time if seizures continue, max dose 2mg (if available).

Morphine

Therapeutic Effects:

- Increases venous capacitance and systemic vascular resistance, relieving pulmonary congestion. In doing so, it reduces intramyocardial wall tension, which decreases myocardial oxygen requirements.

Indications:

- For the treatment of pain and anxiety associated with acute myocardial infarction.

Contraindications:

- It is a respiratory depressant and can produce excessive narcosis.
- Should not be given to patients who are volume depleted or with patients who are dependent on medications for the maintenance of blood pressure.

Adverse Reactions:

- Narcosis
- Hypotension
- Inappropriate heart rate response
- Respiratory depression or arrest

Administration and Dosage:

- **Adults**
  - IV in small incremental doses of 2-5 mg every 5 to 30 min, to a total dose of 10 mg until the desired effect is achieved.
  - Administer Morphine 5mg IV or IM for burns that meet trauma alert criteria and for isolated long bone fractures. May repeat 5mg one time.
  - CP or AMI: 2mg IV PRN. Repeat at 5 minute intervals to a total of 10mg for the normotensive patient.
  - CHF: 2 mg to 4 mg IV if patient not tolerating C-PAP well.
  - Morphine's effects may be acutely reversed with Narcan

- **Pediatrics**
  - Burns: Morphine IV/IO 0.1 mg/kg (max dose 5 mg) for burns exceeding 10% (2nd or 3rd degree) BSA.
  - Fractures: Morphine IV/IO 0.1 mg/kg (max 5mg).
  - May only be administered with physicians' orders

Naloxone
(Narcan)

Therapeutic Effects:

- Narcan is the specific antidote for narcotic agents. Reverses the actions of all narcotic drugs, including Heroin, Morphine, Methadone, Codeine, Lomotil, Demerol, Dilaudid, Darvon, Paregoric and Percodan. Naloxone is effective in counteracting the effects of overdose from any of these agents. Naloxone will reverse stupor, coma, respiratory depression, etc., WHEN THESE ARE DUE TO NARCOTIC OVERDOSE. It is not effective in reversing coma from other causes.

Indications:

- Used for the treatment of narcotic overdose. Coma or altered level of consciousness suspected to be due to narcotic overdose or of an unknown cause.

Contraindications:

- None

Adverse Reactions:

- Too rapid administration may precipitate projectile vomiting and ventricular dysrhythmia.
- Administration to people who are physically dependent on narcotics may cause an acute withdrawal syndrome. For this reason, Naloxone should be given very slowly, using improvement of respiratory status as an end point.
- In general, the duration of action of Naloxone is shorter than that of the narcosis it is used to counteract. Thus, the patient who has been successfully roused with Naloxone may fall back into stupor or comas as the Naloxone wears off. These patients must therefore be watched closely and the dose of Naloxone should be repeated as necessary.

How Supplied:

- In concentrations of 0.4 mg/ml and 1 mg/ml

Administration and Dosage:

- **Adults:**
  - In the field given by slow intravenous injection or nasal atomized.
  - If unresponsive and / or respirations are compromised, administer Narcan 2 mg IV in increments of 0.5mg.
  - OD: May repeat as needed for Methadone or Darvocet overdose. If moderately obtunded, incremental doses of 0.5 mg may be prudent since immediate narcotic withdrawal syndromes may be precipitated. Some agents such as Propoxyphene/ Darvon may require higher doses of Narcan (up to 10 mg) to reverse narcotic effects.
  - AMS: Administer Narcan 2 mg IV in increments of 0.5mg, or Nasal Atomized if no IV access as needed for respiratory depression.
  - Administer this solution very slowly IV while monitoring the rate and depth of the patient's respirations. As soon as there is improvement in the respirations, stop giving the drug.
  - It is preferable that the patient NOT wake up fully in the field, as these patients may be violent when brought abruptly out of coma. USE RESPIRATIONS AS A GUIDE.
  - Cardiac Arrest: 2mg if indicated.
  - Repeat as needed.

- **Pediatrics:**
  - 0.1mg/kg or nasal atomized if no IV access >12 years, as needed for respiratory depression.
  - Repeat as needed

Nitroglycerin
(Nitrostat)

Therapeutic Effects:

- Relaxes smooth muscle and the effects on the cardiovascular system are chiefly due to relaxation of vascular smooth muscle (hence vasodilation). Nitroglycerin provides relief of pain in angina, probably by dilating coronary arteries and thereby increasing blood flow through them as well as by decreasing myocardial oxygen demand. Through its vasodilating action on peripheral vessels, Nitroglycerin promotes pooling of the blood in the systemic circulation and decreases the resistance against which the heart has to pump (the after load). These effects may be useful in treating congestive heart failure.

Indications:

- To relieve the pain of Angina
- To treat selected cases of pulmonary edema due to left heart failure with diastolic blood pressure greater than 100 mm / hg.
- To help reduce blood pressure in hypertensive crisis.

Contraindications:

- Increased intracranial pressure
- Glaucoma
- Hypotension
- Use of Viagra and Viagra like medications.

Adverse Reactions:

- Transient, throbbing headache (if headache does not occur, suspect that the nitroglycerin is outdated and no longer potent).
- Hypotension
- Dizziness, weakness

How Supplied:

- Many forms, including ointment, tablets, sustained release capsules. For use in the field, a spray of 0.4 mg strength is preferred.

Administration and Dosage:

- Given sublingual (under the tongue).
- The patient should be semi sitting or recumbent.
- Administer 0.4 mg (one metered dose) sublingual.
- Repeat every 3-5 minutes PRN, keeping SBP > 100.
- Caution with inferior myocardial infarction. Fluid should be given as a bolus of at least 500ml. Nitroglycerin can be given after systolic blood pressure greater than 120.

Norepinephrine bitartrate
(Levophed)

Therapeutic Effects: Stimulates alpha receptors in the peripheral vasculature, producing vasoconstriction-related increases in system blood pressure. Concurrent beta receptor stimulationmay produce increases in heart rate and mild bronchodilation, though norepinephrine is a weaker beta stimulator than dopamine.

Indications: Hypotension (adult = systolic < 100mmHg) - due to cardiogenic, septic, or neurogenic shock either refractory to intravascular fluid boluses or in which intravascular fluid bolusing is contraindicated (e.g.pulmonary edema).

Contraindications: Hypertension

Precautions: In the setting of tachydysrhythmia-induced cardiogenic shock, treat per Unstable Tachycardia protocol. Ensure aggressive fluid resuscitation is accomplished (unless contraindicated) prior to norepinephrineuse.
Norepinephrine should be given into a large, patent vein. The vein of choice for EMS use is the antecubital vein, as this will decrease the risk of overlying skin necrosis. Do not administer norepinephrine through an IV inthe hand or leg. These veins are more likely to be affected by vaso-occlusive diseases and more prone to ischemic complications. Administration through IO in the leg is permitted.
If local extravasation occurs, notify the receiving physician of the following FDA advisement of antidote toextravasation ischemia:
"To prevent sloughing/necrosis in peripheral ischemic areas promptly use syringe w/ fine hypodermic needle to liberally infiltrate area w/ 10-15 mL saline solution containing 5-10 mg phentolamine; sympathetic blockade causesimmediate conspicuous local hyperemic changes if area infiltrated w/in 12 hours."
Safety in pregnancy not firmly established, though when clinically indicated the benefits outweigh risks. Safetyin pediatrics not firmly established and OLMCP is to be consulted prior to pediatric usage.
Avoid mixing in normal saline, as NS promotes loss of potency through oxidation of norepinephrine.

Pharmacokinetics: Onset of action within 5 minutes after IV/IO infusion initiated. Rapid metabolism, requiringongoing IV/IO infusion to maintain clinical effects.

Adverse/Side Effects: Few, though at higher doses, symptoms may include headache, palpitations, tachycardia, chest pain, and eventual hypertension. Bradycardia can result reflexively from an increase inblood pressure.

Dosage: Adult Cardiogenic/Septic/Neurogenic Shock (as described above) Start at 2-4 mcg/minute - see dosage chart - titrated to a systolic B/P ≥ 100 mmHg. Maximum infusion rate is 18 mcg/minute.

Pediatric Cardiogenic/Septic/Neurogenic Shock
Consult with OLMCP for use and dosing.

How Supplied: 4mg/4ml ampule or vial. **Use only Two (2) ml** in a 250ml bag of D5W or NSS. (8mcg/ml concentration)

Norepinephrine Infusion Adult Dosage Chart
Rates reflect using a microdrip (60drops/ml) set:

mcg/min	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***	***12***
drops/min	***15***	***22***	***30***	***37***	***45***	***52***	***60***	***67***	***75***	***82***	***90***

Oxygen

Therapeutic Effects:

- Elevates arterial oxygen tension and increases arterial oxygen content, thereby improving tissue oxygenation.

Indications:

- Acute chest pain that may be due to cardiac ischemia
- Suspected hypoxemia of any cause
- Cardiopulmonary arrest

Adverse Reactions:

- Oxygen toxicity may occur after prolonged ventilatory support with a high oxygen concentration; however, even
- 100% oxygen is not hazardous to the patient's lungs during the brief time required for clinical resuscitation. **IT SHOULD NEVER BE WITHHELD OR DILUTED DURING RESUSCITATION** because of the mistaken belief that it will be harmful.

Administration and Dosage:

- Can be delivered by mask or nasal cannula for patients with adequate spontaneous breathing.
- For patients who are not breathing spontaneously or whose ventilation is inadequate, oxygen can be delivered by positive - pressure ventilation devices (e.g. BVM, demand valve).
- Oxygen can be adequately delivered by volume-regulated ventilators even during resuscitation of intubated patients.

Pralidoxime Chloride
(2 Pam Chloride)

Therapeutic Effects:

- Mark I kits contain two (2) medications, Atropine 2mg and Pralidoxime Chloride 600mg and are used for the treatment of persons recognized, and for treatment of nerve agents or insecticide intoxications. Pralidoxime Chloride should be used in conjunction as an adjunct to Atropine in the treatment of poisoning by nerve agents having anticholinesterase activities. Pralidoxime relieves muscarinic signs and symptoms, salivation, bronchospasms, etc.…

Indications:

- Used in conjunction with Auto Injection of Atropine for signs and symptoms of nerve agents and insecticide intoxication.

Contraindications:

- Known hypersensitivity to Pralidoxime Chloride.

Adverse Reactions:

- Minor to moderate pain at injection site, may cause blurred vision, dizziness, headache, hyperventilation, nausea, tachycardia, increases in blood pressure, hyperventilation, and muscle weakness.

Administration and Dosage:

- Always administer Atropine first then one Auto Injector of Pralidoxime Chloride 600 mg. intramuscular (minor exposure). After monitoring patient for 10 – 15 minutes if no patient improvement administer another Mark I kit (moderate exposure). For severe exposures a total of three (3) Mark I kits can be administered for a total of 1800 mg of Pralidoxime Chloride.

Sodium Bicarbonate

Therapeutic Effects:

- Sodium Bicarbonate reacts with hydrogen ions to form water and carbon dioxide to buffer metabolic acidosis. Administration of Sodium Bicarbonate does not facilitate ventricular defibrillation or survival in cardiac arrest.

Indications:

- Should be used ONLY after application of more definitive and substantiated interventions, such as prompt defibrillation, effective chest compression, endotracheal intubation and hyperventilation with 100% oxygen, and the use of first- and second-line cardiac medications. These interventions will usually take approximately 10 min., thereafter, Sodium Bicarbonate therapy can be considered in specific clinical circumstances, such as documented preexisting metabolic acidosis with or without hyperkalemia. Sodium Bicarbonate is also indicated in tricyclic antidepressant overdoses under physician orders.

Contraindications:

- Congestive heart failure
- Known respiratory or metabolic alkalosis
- Liver cirrhosis

Adverse Reactions:

- Acid rebound
- Hypercalcemia
- Metabolic alkalosis
- Renal dysfunction

Administration and Dosage:

- 1mEq/kg for cardiac arrest with prolonged downtime (>10 min and intubate)
- Should be administered to all arrested dialysis patients.
- Tricyclic Overdose: with physician's orders.

Solu-Medrol

Therapeutic Effects:

- Decreases the body's inflammatory response as well as suppresses the body's immune system.

Indications:

- Used in the treatment of severe asthma, or COPD.

Contraindications:

- Do not administer to patients with a known hypersensitivity to adrenocorticoid preparations.

Adverse Reactions:

- Depression, euphoria, headaches, restlessness, CHF, hypertension, nausea, vomiting

Administration and Dosage:

- Adults: A single dose of 125mg slow IVP. Solu-Medrol for EMS use will be stored in the "powder" form and mixed on site when ready to use. It will most likely be stored and mixed in an action type vial.
- Pediatrics: 1.5 mg/kg slow IVP.

Succinylcholine
(Anectine)

Therapeutic Effects:

- Anectine is an ultra short-acting depolarizing-type, skeletal muscle relaxant for IV administration. Succinylcholine combines with the cholinergic receptors of the motor end plate to produce depolarization, which may be observed as fasciculation. Subsequent neuromuscular transmission is inhibited so long as adequate concentration of succinylcholine remains at the receptor site. Onset of flaccid paralysis is rapid (less than 1 minute after IV administration), and with single administration, lasts approximately 4 to 6 minutes. The paralysis following administration of succinylcholine is selective, initially involving consecutively the levator muscles of the face, muscles of the glottis and finally the intercostals, the diaphragm, and all other skeletal muscles.

Indications:

- Anectine is indicated to facilitate endotracheal intubation and to provide skeletal muscle relaxation during mechanical ventilation.

Contraindications:

- Succinylcholine is contraindicated for persons with genetically determined disorders of plasma pseudocholinesterase, personal or family history of malignant hyperthermia, myopathies associated with elevated creatine phosphokinase (CPK) values, known hypersensitivity to the drug, acute narrow angle glaucoma, and penetrating eye injuries.

Precautions:

- May cause malignant hyperthermia. Low levels or abnormal variants of pseudocholinesterase may be associated with prolonged respiratory depression or apnea following the use of succinylcholine. Low levels of pseudocholinesterase may occur in patients with the following conditions: burns, severe liver disease, cirrhosis, cancer, severe anemia, pregnancy, malnutrition, severe dehydration, collagen disease, myxedema, and abnormal body temperature. Also, exposure to neurotoxic insecticides, anti-malarial or anti-cancer drugs, monoamine oxidase inhibitors, contraceptive pills, pancuronium, chlorpromazine, echothiophate iodide, or neostigmine may result in low levels of pseudocholinesterase. Anectine should be used with caution, if at all, in patients with glaucoma. The drug should be used with caution in patients with fractures or muscle spasm because the initial fasciculation may cause additional trauma. Anectine may increase intragastric pressure, which could result in regurgitation and possible aspiration of gastric contents.

Adverse Reactions:

- Cardiac arrest, malignant hyperthermia, arrhythmias, bradycardia, tachycardia, hypertension, hypotension, hyperkalemia, prolonged respiratory depression or apnea, increased intra ocular pressure, muscle fasciculation, rhabdomyolysis with possible myoglobinuria acute renal failure, excessive salivation, and rash.

Administration and Dosage:

- **Adult:**
  - 1.5 mg/kg IVP
- **Pediatric:**
  - 1 to 2 mg / kg IVP
- **DO NOT GIVE REPEAT DOSES OF ANECTINE**

Tetracaine Hydrochloride
Ophthalmic Solution 0.5%

Therapeutic Effects:

- Topical anesthetic stabilizes the neuronal membrane and prevents the initiation and transmission of nerve impulses thereby effecting local anesthesia. The onset of anesthesia usually begins within 30 seconds and lasts a relatively short period of time.

Indications:

- For procedures in which a rapid and short acting topical ophthalmic anesthetic is indicated.

Contraindications:

- Should not be used in patients with a known hypersensitivity.

Precautions:

- Patient should be advised not to touch or rub their eye. This can cause corneal damage and allow the anesthetic properties to be worn off quickly.

Adverse Reactions:

- May cause a burning or stinging sensation and conjunctival redness.

Administration and Dosage:

- 2 gtts topically applied to each effected eye. Unused portion should be discarded.

Vasopressin

Therapeutic Effects:

- Vasopressin acts by direct stimulation of smooth muscle V1 receptors. The stimulation of the V1 receptors causes intense peripheral vasoconstriction with less constriction on coronary and renal vessels. It also causes vasodilation of the cerebral vasculature. Vasopressin has a 10 – 20 minute half-life; therefore, only one dose is required during cardiac arrest.

Indications:

- Can be used instead of epinephrine for the treatment of patients in VF / pulseless VT refractory to defibrillation.

Contraindications:

- Only true contraindication during VF / pulseless VT is hypersensitivity to Vasopressin

Adverse Reactions:

- Has been shown to cause fewer side effects than epinephrine

Administration and Dosage:

- **Adult:**
  - 40 U IV. Single dose only; do not repeat. (Can be substituted for 1st or 2nd dose of Epi.)
- **Pediatric:**
  - Not recommended for pediatric patients.

Zofran

Therapeutic Effects:

- A selective agonist of a specific type of serotonin receptor located in the CNS at the area postrema (chemoreceptor trigger zone) and in the peripheral nervous system.

Indications:

- Prevention of nausea/vomiting

Contraindications:

- Hypersensitivity to Zofran

Adverse Reactions:

- Severe adverse reactions include syncope and visual disturbance

Administration and Dosage:

- **Adult:**
  - 4mg IV/IO/IM. Max dose 8mg.
  - 4mg ODT

- **Pediatrics:**
  - 0.15mg/kg IV/IO/IM for 6 months or older. Max dose 4mg
  - 4mg ODT (4years and above)