

IOWA DEPARTMENT OF PUBLIC HEALTH BUREAU OF EMERGENCY MEDICAL SERVICES

Formulary
For
Scott County
Basic and Advanced
(ADULT & PEDIATRIC)



“Promoting and Protecting the Health of Iowans through EMS”

LUCAS STATE OFFICE BUILDING

DES MOINES, IOWA 50319-0075

(515) 281-3741

(800) 728-3367

www.idph.state.ia.us/ems

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Scott County Formulary (Medication List)

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Adenosine

Trade Name(s)	Adenocard
Class	Antidysrhythmic
Mechanism of Action	<ol style="list-style-type: none"> 1. Slows conduction through AV node. 2. Can interrupt reentry pathways through AV node. 3. Can restore normal sinus rhythm in patients with paroxysmal supraventricular tachycardia (PSVT).
Indications	<ol style="list-style-type: none"> 1. Treatment of symptomatic supraventricular tachycardia.
Contraindications	<ol style="list-style-type: none"> 1. Hypersensitivity to drug 2. 2nd or 3rd degree heart block 3. Sick sinus syndrome 4. Atrial flutter or Atrial Fibrillation 5. Ventricular tachycardia
Precautions	<ol style="list-style-type: none"> 1. Use in children and the elderly 2. Use in asthmatics
Side Effects	<ol style="list-style-type: none"> 1. Nausea, throat tightness, groin pressure 2. Dyspnea, chest pressure, hyperventilation 3. Light headedness, dizziness, arm tingling, numbness, apprehension, blurred vision, headache. 4. Chest pain, atrial tachydysrhythmias, sweating, palpitations, hypotension, facial flushing.
Interactions	None
Dosage	IV 6 mg rapid IV push; if needed, give second dose of 12 mg rapid IV. (total of 18 mg)
Pediatric Dose	0.1 mg/kg
Preparation	6 mg vials / preloaded syringes
Special Notes	<ol style="list-style-type: none"> 1. The half-life of Adenosine is less than 5 seconds. Therefore, administration should be in a proximal IV site (antecubital fossa) followed by an immediate 20 ml bolus of normal saline. 2. Adenosine is contraindicated in those patients taking carbamazepine (tegretol, persantine) and dipyridamole.

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Albuterol

Trade Name(s)	Proventil, Ventolin
Class	Beta 2 Agonist
Mechanism of Action	<ol style="list-style-type: none"> 1. Beta 2 adrenergic agonist 2. Relaxes smooth muscle of bronchial passages by activation of Beta receptors located in bronchial smooth muscle.
Indications	<ol style="list-style-type: none"> 1. Relief of bronchospasm in patient with reversible pulmonary constrictive disease. 2. Can be used in patient with bronchospasm as result of anaphylaxis, asthma, and COPD.
Contraindications	Patient with known hypersensitivity
Precautions	<ol style="list-style-type: none"> 1. Should be used with great caution in patient with known cardiovascular disease, especially coronary insufficiency, arrhythmias and hypotension, because of some patients unusual responsiveness to sympathomimetics. 2. Should be used with extreme caution in patient concurrently taking MAO inhibitors and tricyclic antidepressants because of the potentiation of cardiovascular effects.
Side Effects	<ol style="list-style-type: none"> 1. Palpitations 2. Tachycardia 3. Increased Blood Pressure 4. Tremor 5. Dizziness 6. Nausea 7. Bronchospasm
Interactions	None
Dosage	2.5 mg in 2.5 ml saline, by nebulizer
Pediatric Dose	Same as Adult unless directed by Medical Control
Preparation	Unit dose 3ml bottle 0.083%
Special Notes	May be administered with a BVM in patients in respiratory arrest with suspected reactive disease

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Amiodarone

Trade Name(s)	Cordarone, Nexterone
Class	Antidysrhythmic
Mechanism of Action	Complex agent with multiple effects on sodium, potassium and calcium channels.
Indications	<ol style="list-style-type: none"> 1. Cardiac arrest due to shock resistant VF or pulseless VT 2. Perfusing WIDE COMPLEX tachycardia
Contraindications	<ol style="list-style-type: none"> 1. Hypersensitivity to Amiodarone 2. Cardiogenic shock 3. Sinus bradycardia 4. Severe liver disease
Precautions	Not to be used in conjunction with another ventricular Antidysrhythmic
Side Effects	Pulmonary fibrosis
Interactions	None
Dosage	<ol style="list-style-type: none"> 1. 300 mg IV push for cardiac arrest from VF/VT that persists after multiple shocks.. If VF/pulseless VT recurs, consider administration of a second dose of 150 mg IV. Max cumulative dose 2.2 G over 24 hours. 2. Wide Complex tachycardia - 150 mg diluted in 10 ml NS given IV push over 10 min.
Pediatric Dose	5 mg/kg
Preparation	50 mg / ml injection
Special Notes	

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Aspirin

Trade Name(s)	Aspirin
Class	Platelet Aggregator Inhibitor/Anti-Inflammatory Agent
Mechanism of Action	Blocks the formation of thromboxane A2, which causes platelets to aggregate and arteries to constrict. This results in an overall reduction in mortality associated with myocardial infarction.
Indications	New chest pain suggestive of acute myocardial infarction.
Contraindications	1. Patients with known hypersensitivity/allergy to the drug. 2. Relatively contraindicated in active ulcer disease and asthma.
Precautions	1. Can cause gastrointestinal upset and bleeding. 2. Use with caution in patients who report allergies to the non-steroidal anti-inflammatory (NSAID) class of drugs.
Side Effects	Heartburn, GI bleeding, nausea, vomiting, wheezing, and prolonged bleeding.
Interactions	None
Dosage	324 mg (4x81 mg) orally, which may either be chewed or swallowed x 1 dose as soon as possible after the onset of chest pain
Pediatric Dose	Not for pediatric use
Preparation	81 mg each tablet ,obtain from multiple dose bottle
Special Notes	1. When administered in conjunction with other anti-inflammatory agents, an increased incidence of side effects and increased levels of both drugs may occur. 2. Administration with antacids may reduce the blood levels and decrease absorption.

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Atropine

Trade Name(s)	Atropine
Class	Anticholinergic
Mechanism of Action	<ol style="list-style-type: none"> 1. Competes with acetylcholine for receptor sites at the synapse by blocking parasympathetic responses. 2. Increases conduction through heart 3. Inhibits secretions 4. Blocks vagus nerve
Indications	<ol style="list-style-type: none"> 1. Sinus bradycardia with hypotension and/or frequent PVC's. 2. Sinus bradycardia with rate under 50. 3. Organophosphate poisoning
Contraindications	None
Precautions	<ol style="list-style-type: none"> 1. Total dose of 3.0 mg (.04mg/kg) results in full vagal blockade should not be exceeded except in cases of organophosphate poisoning. 2. Hypertension
Side Effects	<ol style="list-style-type: none"> 1. Tachycardia 2. Dry mucous membranes 3. Dilated pupils 4. Paradoxical bradycardia (doses less than 0.5 mg in adult) 5. Toxic levels: flushed skin, restlessness, decreased level of consciousness, irritability and hallucinations.
Interactions	None
Dosage	1. Bradycardia-0.5-1.0 mg IV q 5-10 min., to total dose of 0.03 mg/kg.
Pediatric Dose	0.02 mg/kg, minimum of dose of 0.1 mg
Preparation	Prefilled Disposable Syringes: 1.0 mg in 5 ml
Special Notes	None

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Benadryl

Trade Name(s)	Diphenhydramine hydrochloride
Class	Antihistamine
Mechanism of Action	<ol style="list-style-type: none"> 1. Binds to histamine receptor sites to prevent further allergic reaction. 2. Sedation
Indications	<ol style="list-style-type: none"> 1. Allergic reactions and anaphylaxis (AFTER administration of epinephrine) 2. Idiosyncratic reaction to thorazine, Compazine or phenothiazine related drugs. 3. Anticholinergic action
Contraindications	<ol style="list-style-type: none"> 1. Asthma attack 2. Infant under 20 pounds 3. Nursing mothers
Precautions	Cumulative depressant effects occur in presence of alcohol and/or other sedatives.
Side Effects	<ol style="list-style-type: none"> 1. Drowsiness 2. Syncope 3. Hypotension 4. Thickened mucous secretions 5. Blurred vision 6. Headaches 7. Palpitations 8. Urinary retention 9. Toxic levels: seizures, coma, death
Interactions	None
Dosage	25-50 mg SLOW IV push or deep IM
Pediatric Dose	1 mg/kg SLOW IV push or deep IM
Preparation	Vials: 50 mg in 1 ml
Special Notes	None

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Calcium Chloride 10%

Trade Name(s)	Calcium Chloride
Class	Electrolyte
Mechanism of Action	Antagonizes the effects of Potassium at the cell membrane
Indications	1. Hypocalcemia 2. Magnesium overdose 3. Calcium channel blocker overdose 4. Hyperkalemia
Contraindications	1. Digitalized patients 2. Hypercalcemia
Precautions	1. Confirm vein patency to avoid extravasation and necrosis 2. Be alert for postural hypotension
Side Effects	Local burning sensation, moderate drop in BP, bradycardia and peripheral vasodilation.
Interactions	None
Dosage	0.5 - 1 Gram (5-10 ml of 10% solution) (Requires Medical Control Direction)
Pediatric Dose	Call Medical Control for pediatric dosing
Preparation	1 Gram in 10 ml Pre-filled
Special Notes	May be beneficial for dialysis patients with cardio-respiratory compromise.

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Dextrose 50%

Trade Name(s)	D ₅₀ , D ₅₀ W
Class	Carbohydrate
Mechanism of Action	<ol style="list-style-type: none"> 1. Elevates blood glucose level rapidly. 2. Promotes osmotic diuresis to decrease brain swelling.
Indications	<ol style="list-style-type: none"> 1. Hypoglycemia (Blood Glucose < 60 mg/dl) 2. Seizures of unknown etiology 3. Coma of unknown etiology 4. Decrease cerebral edema and intracranial pressure due to head injury.
Contraindications	<ol style="list-style-type: none"> 1. Do not give into arteries; can cause gangrene. 2. Leakage into tissue causes local damage and necrosis. 3. Known hyperglycemic patient
Precautions	Perform blood glucose test before administration.
Side Effects	None expected
Interactions	None
Dosage	25-50 g IV / IO push, slowly over 2 minutes with IV running to insure vein patency.
Pediatric Dose	D ₂₅ -0.5 g/kg IV or IO; prepare by diluting D ₅₀ 1:1 with normal saline for injection.
Preparation	Preloaded syringe: 25 g in 50 ml water
Special Notes	One bolus of D50 will not adversely affect the hyperglycemic patient.

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Diazepam

Trade Name(s)	Valium
Class	Benzodiazepine
Mechanism of Action	<ol style="list-style-type: none"> 1. Anticonvulsant 2. Skeletal muscle relaxant 3. Sedative 4. Decreases cerebral irritability
Indications	<ol style="list-style-type: none"> 1. Sustained and/or recurrent grand mal seizures. 2. Pre-cardioversion in conscious patient to decrease anxiety and decrease recall. 3. Acute behavioral disorders
Contraindications	<ol style="list-style-type: none"> 1. Under 30 days of age 2. Acute glaucoma 3. Known hypersensitivity
Precautions	<ol style="list-style-type: none"> 1. Can cause local venous irritation 2. Has short duration of effect 3. Do not mix with other drugs due to possible precipitation problems.
Side Effects	<ol style="list-style-type: none"> 1. Respiratory depression/arrest 2. Drowsiness 3. Vertigo 4. Hypotension
Interactions	None
Dosage	IV Push: 2.5-20 mg in 2.5 mg increments over one minute; titrate to effect
Pediatric Dose	IV: 0.25 mg/kg slow IV push (over 3 minutes); may repeat once after 15-30 min. DO NOT use in neonate (less than 30 days old) Rectal: 0.5 mg/kg (maximum 20 mg)
Preparation	Prefilled syringe: 10 mg / 2 ml
Special Notes	Not for use in neonate patients

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Dopamine

Trade Name(s)	Intropin, Revimine
Class	Sympathomimetic. Natural catecholamine with alpha, beta, and dopaminergic stimulatory activity.
Mechanism of Action	<ol style="list-style-type: none"> 1. Positive inotrope 2. Selectively dilates blood vessels of kidney, mesentery, brain, and heart. 3. Increases cardiac output by increasing contractility and increasing stroke volume and also raises the blood pressure. 4. Increases systolic pressure and pulse pressure without increasing diastolic pressure.
Indications	<ol style="list-style-type: none"> 1. Cardiogenic shock 2. Septic shock 3. Anaphylactic shock 4. Hypovolemic shock ONLY after complete fluid volume replacement.
Contraindications	<ol style="list-style-type: none"> 1. Hypovolemic shock where complete fluid resuscitation has not occurred. 2. Severe tachyarrhythmia 3. Presence of ventricular fibrillation 4. Ventricular irritability
Precautions	
Side Effects	<ol style="list-style-type: none"> 1. Ventricular irritability 2. Hypertension and extreme vasoconstriction only in very large doses. 3. Rebound hypotension if infusion rate very slow.
Interactions	Alkaline solutions such as bicarbonate inactivate dopamine.
Dosage	<p>5-20 mcg/kg/min.</p> <ol style="list-style-type: none"> a. 55-120 lbs.-5 gtts/min IVPB. b. 120-300 lbs.-10 gtts/min IVPB. c. May increase initial dose by 10 gtts/min. q 3 min. until 50 gtts/min. reached or systolic BP of 90 is achieved.
Pediatric Dose	2-20 mcg/kg/min per medical control
Preparation	400 mg / 250 ml D5W yields 1600 mcg / ml IV drip.
Special Notes	<ol style="list-style-type: none"> 1. Administered by IV drip only. 2. Induces less myocardial oxygen consumption than Isuprel. 3. Infiltration may cause tissue necrosis. 4. Effects of drug ceases in 10 minutes after drip is stopped.

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Epinephrine Auto-Injector

Trade Name(s)	EpiPen, EpiPen Jr.
Class	Sympathomimetic; naturally occurring catecholamine
Mechanism of Action	<p>Acts on both alpha and beta receptors</p> <ol style="list-style-type: none"> 1. Alpha receptor action <ul style="list-style-type: none"> • Strong vasoconstrictor action acts quickly to counter vasodilation and increased vascular permeability • Decrease in vasodilation and vascular permeability should reduce the loss of intravascular fluid volume and hypotension associated with anaphylaxis 2. Beta receptor action <ul style="list-style-type: none"> • Bronchial smooth muscle relaxation • Alleviation in wheezing and dyspnea 3. Alleviates itching, urticaria, and angioedema 4. May be effective in relieving genitourinary and gastrointestinal symptoms associated with anaphylaxis.
Indications	Indicated for the emergency treatment of allergic reactions (anaphylaxis) to insect stings or bites, foods, drugs, and other allergens
Contraindications	No absolute contraindications to the use of epinephrine in a life-threatening situation
Precautions	<ol style="list-style-type: none"> 1. Administer with extreme caution to patients with heart disease 2. Effects may be potentiated by tricyclic antidepressants and monoamine oxidase inhibitors. 3. Hyperthyroid patients, patients with cardiovascular disease, hypertension or diabetes, elderly patients, pregnant women, and children under 30 kg (66 lbs) may be at greater risk of developing adverse reactions after epinephrine admin.
Side Effects	Palpitations, tachycardia, sweating, nausea/vomiting, respiratory difficulty, pallor, dizziness, weakness, tremor, headache, apprehension, nervousness and anxiety, cardiac arrhythmias
Interactions	None
Dosage	Adults greater than 66 lbs./30 kg: EpiPen Auto-Injector 1:1000 0.3 mg/0.3ml in anterolateral thigh
Pediatric Dose	Children 66 lbs/30 kg or less: EpiPen Junior EpiPen Auto-Injector 1:2000 0.15mg/0.3ml in anterolateral thigh
Preparation	See Dosage above
Special Notes	<ol style="list-style-type: none"> 1. DO NOT ADMINISTER INTO BUTTOCK 2. Light sensitive; store in tube provided. 3. Avoid injection into hands or feet; may cause a loss of blood flow to the area.

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Epinephrine 1:1,000

Trade Name(s)	Adrenaline. "Epi"
Class	Sympathomimetic, Natural catecholamine
Mechanism of Action	<ol style="list-style-type: none"> 1. Bronchodilation 2. Increases heart rate, contractility, AV conduction, and myocardial irritability. 3. Increases blood pressure in anaphylaxis through peripheral vasoconstriction
Indications	<ol style="list-style-type: none"> 1. Bronchial asthma or Anaphylaxis 2. Exacerbation of some forms of COPD 3. Bradycardia (Epi Drip).(Pediatric and Adult)
Contraindications	<ol style="list-style-type: none"> 1. Patients with underlying cardiac disease 2. Hypertension or tachydysrhythmias 3. Pregnancy
Precautions	<ol style="list-style-type: none"> 1. Should be protected from light 2. Constantly monitor vital signs and EKG.
Side Effects	<ol style="list-style-type: none"> 1. Palpitations 2. Anxiousness 3. Headache 4. Ventricular irritability, PVC's
Interactions	None
Dosage	<ol style="list-style-type: none"> 1. 0.3 mg IM; may repeat in 15-20 min if no relief. 2. Epi Drip- 1mg Epinephrine 1:1,000 added to 1,000ml Normal Saline attached to a micro drip tubing set. Administer IV piggyback at a rate of 60 microdrops per minute into a fast running IV of Normal Saline
Pediatric Dose	0.01 mg/kg IM not to exceed 0.3 mg
Preparation	<ol style="list-style-type: none"> 1. Vials: 1 mg/ml 2. Epi Drip- 1mg Epinephrine 1:1,000 added to 1,000ml Normal Saline attached to a micro drip tubing set.
Special Notes	<ol style="list-style-type: none"> 1. Contact Medical Control for Anaphylaxis 2. Never used in presence of pulmonary edema 3. Store in dark; discard if drug discolored or precipitate occurs 4. Has both alpha and beta properties 5. Administer slowly

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Epinephrine 1:10,000

Trade Name(s)	Adrenalin, "Epi"
Class	Sympathomimetic, Natural catecholamine
Mechanism of Action	<ol style="list-style-type: none"> 1. Increases heart rate, contractility, AV conduction, and myocardial irritability. 2. Bronchodilation 3. Peripheral vasoconstriction
Indications	<ol style="list-style-type: none"> 1. Fine ventricular fibrillation (to help convert to coarse VF before defibrillation) 2. Asystole 3. Peripheral vasoconstriction 4. Symptomatic Bradycardia
Contraindications	None when used in situations above
Precautions	<ol style="list-style-type: none"> 1. Should be protected from light 2. Constantly monitor vital signs and EKG
Side Effects	<ol style="list-style-type: none"> 1. Tachydysrhythmias 2. Ventricular irritability
Interactions	None
Dosage	1 mg every 3-5 minutes IV push. Other doses may be used as directed by physician.
Pediatric Dose	Bradycardia and cardiac arrest, initial dose-0.01 mg/kg IV.
Preparation	Prefilled syringe: 1 mg / 10 ml
Special Notes	<ol style="list-style-type: none"> 1. Store in dark, discard if discolored or precipitate occurs 2. Never used in presence of pulmonary edema 3. Has both Alpha and Beta properties: administer slowly.

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Fentanyl

Trade Name(s)	Actiq, Sublimaze, Duragesic, Fentora
Class	Opioid Analgesic
Mechanism of Action	Inhibits ascending pain pathways in CNS, Increases pain threshold, Alters pain perception by binding to opiate receptors
Indications	To relieve pain in isolated orthopedic trauma, burns, and other pain conditions. Acute Coronary Syndromes
Contraindications	Hypersensitivity to drug class or components/opiates, myasthenia gravis
Precautions	Elderly patients, impaired renal/liver function, head injury, increased intracranial pressure, impaired pulmonary function, impaired cardiovascular function, bowel obstruction, prostatic hypertrophy, CNS or respiratory depressant use, hypotension, biliary disease, seizure disorder, inflammatory bowel disease, pregnancy, lactation
Side Effects	Bradycardia, cardiac arrest, respiratory depression/arrest, laryngospasm, dizziness, delirium, euphoria, hypo/hypertension, blurred vision, meiosis, nausea/vomiting, urinary retention, rash, diaphoresis, muscle rigidity (i.e., thoracic muscle tetany)
Interactions	Increase w/ other CNS depressants, alcohol, opiates, sedative/hypnotics, antipsychotics, and skeletal muscle relaxants
Dosage	25-50 mcg IV push or Intranasal; may repeat q 5 minutes up to total dose of 100 mcg. Onset 60 seconds. Duration of action 30-60 minutes May be given Intranasal prior to IV initiation in trauma patients (Pediatrics). IV should be initiated if patient condition warrants after administration (such as hemodynamic instability or hypoventilation).
Pediatric Dose	1mcg / kg IV, IM or Intranasal. Duration of action 30-60 minutes
Preparation	2 mL vial, containing 50 mcg/mL
Special Notes	May reverse drug effects with Naloxone (Narcan)Room temperature storage May cause thoracic muscle paralysis/tetany post administration

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Glucagon

Trade Name(s)	Glucagon
Class	Pancreatic Hormone-Insulin Antagonist
Mechanism of Action	Indirectly raises glucose levels by stimulating hepatic production of glucose from glycogen stores (glycogenolysis).
Indications	1. Acute management of severe hypoglycemia when administration of oral or IV glucose is not feasible. 2. Altered level of consciousness when hypoglycemia is suspected and IV access is unavailable
Contraindications	1. Hypersensitivity to beef or pork protein 2. Diluent contains glycerin and phenol - avoid use in patients with hypersensitivities to these ingredients.
Precautions	May take up to twenty minutes to achieve desired effect of increased blood sugar.
Side Effects	1. Nausea, vomiting 2. Hypersensitivity reactions
Interactions	None
Dosage	1 mg/ml Glucagon to be given IM, IV, or SC.
Pediatric Dose	0.5-1 mg IM for children under 40 kg
Preparation	Reconstitute by injecting diluting solution into medication vial yielding 1 mg / ml vial.
Special Notes	1. Medication is incompatible with 0.9% NaCl - must use diluent. 2. Be alert for potential emesis and aspiration, place patient in appropriate position (side lying).

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Ipratropium Bromide & Albuterol Sulfate

Trade Name(s)	Duoneb
Class	Anticholinergic and Beta 2 agonist
Mechanism of Action	<ol style="list-style-type: none"> 1. Parasympatholytic inhibition of bronchoconstriction 2. Relaxes smooth muscle of bronchial passages by activation of Beta receptors located in bronchial smooth muscle.
Indications	<ol style="list-style-type: none"> 1. Relief of bronchospasm in patient with reversible pulmonary constrictive disease. 2. Can be used in patient with bronchospasm as result of anaphylaxis, asthma, and COPD.
Contraindications	<ol style="list-style-type: none"> 1. Patients with known hypersensitivity to Albuterol or Atropine 2. Patients with hx of Glaucoma 3. Patients 5 years and under
Precautions	<ol style="list-style-type: none"> 1. Should be used with great caution in patient with known cardiovascular disease, especially coronary insufficiency, arrhythmias and hypertension, because of some patients unusual responsiveness to sympathomimetics. 2. Should be used with extreme caution in patient concurrently taking MAO inhibitors and tricyclic antidepressants because of the potentiation of cardiovascular effects.
Side Effects	<ol style="list-style-type: none"> 1. Palpitations 2. Tachycardia 3. Increased Blood Pressure 4. Tremor 5. Dizziness 6. Nausea 7. Bronchospasm
Interactions	None
Dosage	Unit dose DUONEB (Ipratropium Bromide 0.5 mg and Albuterol 3.0 mg) in 3 ml via nebulizer
Pediatric Dose	Above five years of age Unit dose DUONEB (Ipratropium Bromide 0.5 mg and Albuterol 3.0 mg) in 3 ml via nebulizer
Preparation	Unit dose 3ml (Ipratropium Bromide 0.5 mg and Albuterol 3.0 mg)
Special Notes	Not for use in patients under five years of age

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Ketamine Behavioral

Trade Name(s)	Ketamine								
Class	Anesthetic CIII								
Mechanism of Action	NMDA (N-methyl-D-aspartic acid) receptor antagonist. Dissociative anesthetic 30 second onset time. Duration of 45 minutes with a 10-15 minute half life								
Indications	Extreme agitation and combativeness caused by excited delirium where the paramedic determines that the patient is a danger to themselves or others								
Contraindications	Hypertensive patients or those whom would have an adverse reaction to hypertension. Not for use in the acutely intoxicated patient or the chronic alcoholic. Acute globe injury. Documented Schizophrenia, CNS Abnormalities. Thyroid disorders. Pregnancy								
Precautions	Maintain vigilance in monitoring of airway patency. Slow push over 60 seconds.								
Side Effects	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Hypertension</td> <td style="width: 50%;">Fasiculations</td> </tr> <tr> <td>Tachycardia</td> <td>Increased Salivation</td> </tr> <tr> <td>Arrhythmia</td> <td>Laryngospasm</td> </tr> <tr> <td>Respiratory depression</td> <td>Apnea.</td> </tr> </table>	Hypertension	Fasiculations	Tachycardia	Increased Salivation	Arrhythmia	Laryngospasm	Respiratory depression	Apnea.
Hypertension	Fasiculations								
Tachycardia	Increased Salivation								
Arrhythmia	Laryngospasm								
Respiratory depression	Apnea.								
Interactions	Barbiturates or narcotics use may extend recovery time								
Dosage	200mg up to 69kg, 300mg 70-89 kg, 400mg 90+kg. IM in adult patients and may be repeated in 3-5 minutes if needed								
Pediatric Dose	Not to be used in pediatric patients								
Preparation	500mg / 5 ml vial								
Special Notes	Not for use in pediatric patients under the age of 10 years. To be administered in the lateral thigh.								

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Ketamine Pain

Trade Name(s)	Ketamine	
Class	Anesthetic CIII	
Mechanism of Action	NMDA (N-methyl-D-aspartic acid) receptor antagonist. Dissociative anesthetic 30 second onset time. Duration of 45 minutes with a 10-15 minute half life	
Indications	Pain not relieved by 2 doses of Fentanyl or Morphine	
Contraindications	Hypertensive patients or those whom would have an adverse reaction to hypertension. Not for use in the acutely intoxicated patient or the chronic alcoholic. Acute globe injury. Documented Schizophrenia, CNS Abnormalities. Thyroid disorders. Pregnancy	
Precautions	Maintain vigilance in monitoring of airway patency. Slow push over 60 seconds.	
Side Effects	Hypertension Tachycardia Arrhythmia Respiratory depression	Fasciculations Increased Salivation Laryngospasm Apnea.
Interactions	Barbiturates or narcotics use may extend recovery time	
Dosage	100mg in 100ml Normal Saline bag infused through a microdrip set (60gtt) infused at 15 gtts per minute. May be increased to 30 gtts per minute after five minutes if pain persists.	
Pediatric Dose	Not to be used in pediatric patients	
Preparation	500mg / 5 ml vial	
Special Notes	Not for use in pediatric patients under the age of 10 years.	

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Lidocaine

Trade Name(s)	Xylocaine, Lido
Class	Local anesthetic
Mechanism of Action	1. Provides anesthetic action in the intraosseous site if administered prior to fluid administration.
Indications	1. Osseous anesthetic to facilitate reduced pain on fluid administration through an intraosseous infusion to a conscious adult patient.
Contraindications	1. Known sensitivity to lidocaine or any other local anesthetic 2. Stokes-Adams syndrome
Precautions	1. Monitor the patients EKG continuously 2. Discontinue lidocaine use if any signs of toxicity become apparent. 3. Use caution in severe liver or renal disease, hypovolemia, shock, all forms of heart block, and untreated bradycardia 4. Do not add lidocaine to blood transfusion tubing.
Side Effects	Transient because of short duration of action 1. Minor: apprehension, blurred vision, dizziness, drowsiness, euphoria, numbness, tinnitus, vomiting. 2. Major: anaphylaxis, arrest, bradycardia, cardiovascular collapse, convulsions, hypotension, PR interval prolonged, QRS widening, respiratory depression, tremors, twitching, unconsciousness.
Interactions	None
Dosage	40mg Bolus prior to fluid administration in conscious adult patients
Pediatric Dose	1 mg / kg
Preparation	100 mg lidocaine per 10 cc for bolus.
Special Notes	None

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Magnesium Sulfate

Trade Name(s)	Mag Sulfate, Mag
Class	Anticonvulsant
Mechanism of Action	<ol style="list-style-type: none"> 1. Decreases acetylcholine in motor nerve terminals, which is responsible for anticonvulsant properties. 2. Reduces SA node impulse formation prolonging conduction time in the myocardium.
Indications	<ol style="list-style-type: none"> 1. Hypomagnesaemia seizures 2. Control of seizures in pregnancy induced hypertension 3. Refractory and recurrent V-fib/V-tach 4. Treatment of choice in patients with torsades de pointes
Contraindications	<ol style="list-style-type: none"> 1. Hypersensitivity 2. Renal disease 3. Myocardial Infarction
Precautions	
Side Effects	<ol style="list-style-type: none"> 1. Sweating, flushing, drowsiness, flaccid paralysis, hypothermia, weakness 2. hypotension, circulatory collapse, heart block, decreased cardiac function
Interactions	None
Dosage	For recurrent VF/VT: 1-2 grams slow IV bolus over at least 2 minutes.
Pediatric Dose	No pediatric dose
Preparation	Vial containing 1 gm in 2 ml 50% solution.
Special Notes	

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Midazolam

Trade Name(s)	Versed
Class	Anesthetic
Mechanism of Action	Acts on the benzodiazepine binding site of GABA receptors
Indications	Amnesia induction, anti-anxiety, premedication for cardioversion, seizure mitigation
Contraindications	Hypersensitivity to midazolam or other benzodiazepines
Precautions	May cause respiratory depression and / respiratory distress.
Side Effects	<ol style="list-style-type: none">1. Apnea2. Respiratory depression3. Respiratory arrest4. Hypotensive episode5. Cardiac arrest6. Residual "hangover" effects after administration
Interactions	None
Dosage	5mg Intranasal, IV, IO or IM. May be repeated in five (5) minutes if symptoms return. Post intubation to a semi-conscious patient to facilitate continuation of a secure airway.
Pediatric Dose	0.15 mg/kg Intranasal, IV, IO or IM. May be repeated in Five (5) minutes if symptoms return.
Preparation	10 mg in 2 ml vial (single dose)
Special Notes	For intranasal administration, limit fluid to 1ml per nare.

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Morphine Sulfate

Trade Name(s)	Morphine, MS
Class	Narcotic Agonist
Mechanism of Action	Potent analgesic, providing relief of pain in AMI and other conditions.
Indications	To relieve pain in myocardial infarction, isolated trauma, burns, and other conditions.
Contraindications	<ol style="list-style-type: none">1. Marked hypotension2. Respiratory depression3. Asthma and COPD4. In patients who have taken other depressant drugs5. Head Injury6. Undiagnosed abdominal pain
Precautions	Watch for hypotension and respiratory depression.
Side Effects	<ol style="list-style-type: none">1. Hypotension2. Increased vagal tone, leading to bradycardia3. Respiratory depression4. Nausea and vomiting5. Urinary retention
Interactions	None
Dosage	2-10 mg IV slowly May be repeated every 5 minutes up to a total of 10mg or titrate to pain relief.
Pediatric Dose	0.1 mg/kg IV up to 10 mg
Preparation	Prefilled syringe containing 10 mg/ml
Special Notes	Not to be used for pain relief in multi system trauma

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Naloxone

Trade Name(s)	Narcan
Class	Narcotic Antagonist
Mechanism of Action	Reverses effects of narcotic overdose by occupying opiate receptor sites (includes synthetic narcotics and endogenous opiates)
Indications	<ol style="list-style-type: none"> 1. Narcotic overdoses including: morphine, Dilaudid, fentanyl, Demerol, Paregoric, Methadone, Heroin, Percodan, Codeine. 2. Synthetic analgesic overdoses 3. Diagnostic tool in coma of unknown origin 4. Cardiac Arrest 2mg IVP
Contraindications	Known hypersensitivity to Naloxone
Precautions	<ol style="list-style-type: none"> 1. Administer with caution to patients dependent on narcotics; may precipitate withdrawal syndrome and/or combative behavior. Goal should be to titrate to respiratory response, NOT to totally awaken patient. 2. Quick onset of action (30 seconds-2 minutes if given IV, within minutes if given IM) 3. Short duration of action: should be closely monitored and augmented every 5 minutes.
Side Effects	None Expected
Interactions	None
Dosage	2.0 mg repeated every 3 minutes as needed IV push, Intranasal, or IM
Pediatric Dose	0.1 mg/kg/dose IV push, Intranasal, or IM; may repeat
Preparation	Bristoject: 2mg in 2ml preloaded
Special Notes	Do not insert advanced airway prior to administration.

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Nitroglycerin

Trade Name(s)	NTG, Nitro, Nitrostat
Class	Vasodilator
Mechanism of Action	<ol style="list-style-type: none"> 1. Produces systemic vasodilation, thereby causing decreased right heart return. 2. Decreases myocardial workload 3. Decreases myocardial oxygen consumption 4. Dilation of coronary arteries
Indications	<ol style="list-style-type: none"> 1. Angina pectoris 2. Chest pain associated with MI 3. Aid in relief of pulmonary edema
Contraindications	<ol style="list-style-type: none"> 1. Children under the age of puberty 2. Hypotension 3. Dehydration 4. Hypersensitivities, nitrates & nitrites 5. Use of sexual enhancement medications
Precautions	<ol style="list-style-type: none"> 1. May cause severe hypotension in patient with pneumonia. 2. Monitor blood pressure constantly 3. Because of blood pressure effects, IV should be infusing before administration to counteract any hypotensive effects. 4. May cause severe hypotension in a patient with a right ventricular MI
Side Effects	<ol style="list-style-type: none"> 1. Headache (Note: if medication is effective, a throbbing headache should be experienced) 2. Dizziness 3. Transient hypotension, may be profound 4. Facial flushing
Interactions	Contact medical control for an order with a patient known to use sexual enhancement medications recently.
Dosage	.4 mg tablet given sublingually every 5 minutes to a total dose of 3 tablets
Pediatric Dose	Not to be used on pediatric patients
Preparation	0.4mg tablet or 0.4mg spray
Special Notes	<ol style="list-style-type: none"> 1. Check blood pressure before and after administration. 2. Effective in 1-2 minutes; effects last up to 30 minutes

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Normal Saline

Trade Name(s)	NS, 0.9% Sodium Chloride, NaCl, Physiologic Saline
Class	Crystalloid
Mechanism of Action	<ol style="list-style-type: none"> 1. Increases circulating blood volume by remaining in the vascular space. 2. Fluid and sodium replacement
Indications	<ol style="list-style-type: none"> 1. Dehydration 2. Eye irrigant 3. Trauma 4. Burns 5. Heat related problems (such as heat stroke and heat exhaustion) 6. Diabetic ketoacidosis 7. Hypothermia 8. Hyperthermia 9. Septic shock 10. Internal hemorrhage
Contraindications	<ol style="list-style-type: none"> 1. Congestive heart failure 2. Pulmonary edema
Precautions	Electrolyte depletion (potassium, magnesium, calcium, etc...) may occur after administering of large amounts of normal saline.
Side Effects	Thirst
Interactions	None
Dosage	IV drip, regulated by patient needs
Pediatric Dose	10 ml/kg, regulated by patient need
Preparation	250 ml bag, 1000 ml bag
Special Notes	<ol style="list-style-type: none"> 1. Content: 154 mEq Sodium per liter 154 mEq Chloride per liter 2. Use conservatively with head injury 3. Fluid of choice for diabetic ketoacidosis and alcoholic patient 4. In freshwater drowning and heat emergencies, administration is usually rapid

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Ondansetron

Trade Name(s)	Zofran
Class	Serotonin Antagonist
Mechanism of Action	<ol style="list-style-type: none">1. Selective 5HT₃ receptor antagonist in the small intestine.2. Blocks the initiation of the vagal reflex and reduces nausea
Indications	Management of nausea and vomiting
Contraindications	Hypersensitivity to any component of the preparation
Precautions	<ol style="list-style-type: none">1. Hypersensitivity reactions have been reported in patients who have exhibited hypersensitivity to other HT₃ receptor antagonists.2. Known to increase large bowel transit time, patients with sub-acute intestinal obstruction should be monitored after administration.
Side Effects	<ol style="list-style-type: none">1. Headache.2. Blurred vision or dizziness (with rapid infusion).3. Constipation.4. Hypersensitivity including rare cases of anaphylaxis.
Interactions	None
Dosage	4mg IV push over 2 minutes once repeated in one hour
Pediatric Dose	0.1 mg/kg over 2 minutes up to 4mg total
Preparation	4mg in 2ml vial (single use)
Special Notes	May be given in conjunction with Morphine to avoid risk of nausea induced by morphine administration

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Oxygen

Trade Name(s)	O ₂												
Class	Odorless, colorless and tasteless gas necessary for life												
Mechanism of Action	<ol style="list-style-type: none"> 1. To increase arterial oxygen concentration 2. To minimize or prevent tissue hypoxia, which can lead to cellular damage and death. 												
Indications	<ol style="list-style-type: none"> 1. Known or suspected hypoxemia of any cause 2. Chest pain 3. Cardiac and/or Respiratory arrest 4. Trauma 5. Situations in which a patient's oxygen demands have or may have increased. 												
Contraindications	None in the emergency setting.												
Precautions	<ol style="list-style-type: none"> 1. Assess respiratory effort as well as the need for supplemental oxygen, and if inadequate, provide assisted ventilation 2. The administration of high concentrations of oxygen in COPD patients may cause a decrease in the ventilatory effort, or even apnea. Observe ventilatory effort closely in these types of patients, and assist ventilation as needed. 3. The prolonged administration of high quantities of O₂ to newborn infants can result in eye damage (consider in long-distance neonatal transports). 												
Side Effects	<ol style="list-style-type: none"> 1. Can be drying and irritating to mucous membranes. 2. None for adults when given for short periods (<24 hours). 												
Interactions	None												
Dosage	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 33%;">DEVICE</th> <th style="width: 33%;">LITERS PER MINUTE</th> <th style="width: 33%;">O₂ CONCENTRATION</th> </tr> </thead> <tbody> <tr> <td>Nasal Cannula</td> <td>1-6</td> <td>24-44%</td> </tr> <tr> <td>Non-Rebreather Mask</td> <td>10-15</td> <td>80-100%</td> </tr> <tr> <td>Bag-Valve Mask with Reservoir</td> <td>10-15</td> <td>80-100%</td> </tr> </tbody> </table>	DEVICE	LITERS PER MINUTE	O ₂ CONCENTRATION	Nasal Cannula	1-6	24-44%	Non-Rebreather Mask	10-15	80-100%	Bag-Valve Mask with Reservoir	10-15	80-100%
DEVICE	LITERS PER MINUTE	O ₂ CONCENTRATION											
Nasal Cannula	1-6	24-44%											
Non-Rebreather Mask	10-15	80-100%											
Bag-Valve Mask with Reservoir	10-15	80-100%											
Pediatric Dose	Same as adult dosing												
Preparation	Stored in Green Cylinders												
Special Notes	Accelerates combustion												

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Phenylephrine HCL

Trade Name(s)	Neo-Synephrine, Coricidin Nasal Mist, Sinarest
Class	Nasal Decongestant
Mechanism of Action	Produces vasoconstriction (rapid, long-acting) of arterioles, thereby decreasing fluid exudation, and mucosal engorgement.
Indications	<ol style="list-style-type: none"> 1. Relief of nasal congestion 2. Arterial vasoconstriction in nares preceding nasotracheal intubation
Contraindications	Hypersensitivity to sympathomimetic amines
Precautions	<ol style="list-style-type: none"> 1. Children less than 6 and the elderly 2. Use in diabetics 3. Use in hypertension, hyperthyroidism, increased ICP, and glaucoma
Side Effects	<ol style="list-style-type: none"> 1. Nausea, vomiting, anorexia 2. Nasal irritation, burning, sneezing, stinging, dryness, rebound congestion 3. Contact dermatitis 4. Anxiety, restlessness, tremors, weakness, insomnia, dizziness, fever, headache
Interactions	None
Dosage	Instill 2-3 sprays to nasal mucosa
Pediatric Dose	Not indicated for pediatric use
Preparation	Solution of 0.5%
Special Notes	None

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Sodium Bicarbonate

Trade Name(s)	Bicarb, NaHCO ₃
Class	Alkalinizing agent
Mechanism of Action	<ol style="list-style-type: none"> 1. Combines with excessive acids to form a weak, volatile acid which is more easily excreted by the body. 2. Increases ph.
Indications	<ol style="list-style-type: none"> 1. Cardiac arrest (to neutralize metabolic acidosis) 2. Alkalinize blood in tricyclic antidepressant overdose (reversing the drug-induced dysrhythmias and decreasing blood pressure) 3. Reverse acidosis of salicylate and methanol intoxication 4. Increase excretion by the kidneys of drugs which are acids by chemical structure (ex. barbiturates).
Contraindications	Alkaloid states
Precautions	<ol style="list-style-type: none"> 1. Correct dosage is essential to avoid overcompensation of PH 2. Can deactivate catecholamines 3. Can precipitate with calcium
Side Effects	<ol style="list-style-type: none"> 1. Metabolic alkalosis 2. Cardiac dysrhythmias 3. Sodium overload 4. Pulmonary edema 5. Cerebral edema 6. Congestive heart failure
Interactions	None
Dosage	Cardiac Arrest: 1 mEq/kg IV push 8.4% solution. Doses for other conditions are per medical control orders
Pediatric Dose	Cardiac Arrest: 4.2% solution 1mEq / kg IV push. Prepare by diluting Bicarb 8.4% 1:1 with normal saline for injection
Preparation	Preloaded syringe: 50 mEq/50 ml-8.4% solution.
Special Notes	<ol style="list-style-type: none"> 1. Metabolic alkalosis interferes with oxygen delivery to the tissues and causes refractory dysrhythmias. 2. Adequate ventilatory status necessary, whether spontaneous, assisted, or totally managed. 3. Precipitates if mixed with calcium chloride -flush tubing well between drugs.

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Tranexamic Acid

Trade Name(s)	TXA
Class	Antifibrinolytic
Mechanism of Action	Inhibits plasminogen activation and plasmin activity preventing clot breakdown
Indications	<ol style="list-style-type: none"> 1. Severe bleeding associated with trauma in patients greater than 16 years of age excluding head injuries. 2. Systolic blood pressure less than 90mmHg or Heart rate greater than 110 with associated hemorrhage 3. Injuries such as pelvic or femur fractures, 4. Penetrating or blunt injuries 5. Internal hemorrhage is suspected cause of shock 6. Bleeding from non-compressible site 7. Bleeding from tumor mass 8. Severe hemoptysis
Contraindications	<ol style="list-style-type: none"> 1. Hypersensitivity to TXA, 2. Subarachnoid Hemorrhage 3. Injuries greater than 3 hours old, 4. Laboratory evidence of Disseminated Intravascular Coagulation.
Precautions	Use caution in patients with pulmonary embolism history or renal failure. Can be excreted through breast milk.
Side Effects	<ol style="list-style-type: none"> 1. Visual disturbances, 2. Headache, 3. Hypotension with rapid administration, 4. Abdominal pain, nausea and vomiting
Interactions	No studies have been conducted
Dosage	1 gram in 50ml bag (1 gram vial)
Pediatric Dose	Rarely Used, Medical control order
Preparation	100mg/ml 1 ml in a 10ml vial (1 gram total)
Special Notes	Inject 1gm of TXA into 50ml bag of N.S. and administer via IV infusion over 10 minutes. Prepare just prior to administration.

