

Paramedic Drug Reference

Revised 11/11/03

Activated Charcoal

CLASS:	Adsorbent
ACTIONS:	Adsorbs toxins by chemical binding and prevents gastrointestinal adsorption.
INDICATIONS:	Poisoning following emesis or when emesis is contraindicated.
CONTRAINDICATIONS:	None in severe poisoning.
PRECAUTIONS:	Should only be administered following emesis, in cases in which it is so indicated. Use with caution in patients with altered mental status. May adsorb Ipecac before emesis; If Ipecac is administered, wait at least 10 minutes to administer activated charcoal.
SIDE EFFECTS:	Nausea, vomiting, and constipation.
DOSAGE:	1 g/kg (typically 50-75 grams) mixed with a glass of water to form a slurry.
ROUTES:	Oral
PEDIATRIC DOSAGE:	1g/kg mixed with a glass of water to form a slurry

Adenosine (Adenocard)

CLASS:	Antiarrhythmic
ACTIONS:	slows AV conduction
INDICATIONS:	symptomatic PSVT
CONTRAINDICATIONS:	second- or third-degree heart block, sick-sinus syndrome, known hypersensitivity to the drug.
PRECAUTIONS:	Arrhythmias, including blocks, are common at the time of cardioversion. Use with caution in patients with asthma.
SIDE EFFECTS:	Facial flushing, headache, shortness of breath, dizziness, and nausea.
DOSAGE:	6 mg given as a rapid IV bolus over a 1-2 second period; if, after 1-2 minutes, cardioversion does not occur, administer a 12-mg dose over 1-2 seconds.
ROUTES:	IV; should be administered directly into a vein or into the medication administration port closest to the patient and followed by flushing of the line with IV fluid.
PEDIATRIC DOSAGE:	Safety in children has not been established.

Albuterol (Proventil) (Ventolin)

CLASS:	Sympathomimetic (β_2 selective)
ACTIONS:	Bronchodilation
INDICATIONS:	Asthma reversible bronchospasm associated with COPD
CONTRAINDICATIONS:	Known hypersensitivity to the drug, symptomatic tachycardia
PRECAUTIONS:	Blood pressure, pulse, and EKG should be monitored use caution in patients with known heart disease
SIDE EFFECTS:	Palpitations, anxiety, headache, dizziness, and sweating
DOSAGE:	Metered Dose Inhaler: 1-2 sprays (90 micrograms per spray) Small-Volume Nebulizer: 0.5 ml (2.5 mg) in 2.5 ml normal saline over 5-15 minutes Rotohaler: one 200-microgram rotocap should be placed in the inhaler and breathed by the patient
ROUTES:	Inhalation
PEDIATRIC DOSAGE:	0.15 mg (0.03 ml)/kg in 2.5 ml normal saline by small volume nebulizer

Aminophylline

CLASS:	Xanthine bronchodilator
ACTIONS:	Smooth muscle relaxant, causes bronchodilation, has mild diuretic properties, increases heart rate.
INDICATIONS:	Bronchial asthma, reversible bronchospasm associated with chronic, bronchitis and emphysema, congestive heart failure, pulmonary edema.
CONTRAINDICATIONS:	Patients with history of hypersensitivity to the drug, hypotension, patients with peptic ulcer disease.
PRECAUTIONS:	Monitor for arrhythmias. Monitor blood pressure. Do not administer to patients on chronic theophylline. Preparations until the theophylline blood level has been determined.
SIDE EFFECTS:	Convulsions, tremor, anxiety, and dizziness vomiting palpitations, PVCs, and tachycardia.
DOSAGES:	Method 1: 250 - 500 mg in 90 or 80 ml of d5w, respectively, infused over 20-30 minutes (approximately 5-10 mg/kg/hr) Method 2: 250 - 500 mg (5-7 mg/kg) in 20 ml of D5W infused over 20-30 minutes
ROUTES:	Slow IV infusion.
PEDIATRIC DOSAGE:	6 mg/kg loading dose to be infused over 20-30 minutes; maximum dose not to exceed 12 mg/kg per 24 hours.

Amiodarone HCL (Cordarone)

CLASS:	Aniarrhythmic (Group III)
ACTIONS:	Prolongs action potential and refractory period Slows the sinus rate; Increases PR and QT intervals Decreases Peripheral vascular resistance
INDICATIONS:	Life-threatening cardiac arrhythmias such as ventricular tachycardia and ventricular fibrillation.
CONTRAINDICATIONS:	Severe sinus node dysfunction Sinus Bradycardia Second and Third Degree Block Hemodynamically significant bradycardia
PRECAUTIONS:	Heart Failure
SIDE EFFECTS:	Hypotension Nausea Anorexia Malaise – Fatigue Tremors Pulmonary toxicity Ventricular escape beats
DOSAGE:	Adults – V-Fib / V-Tach without pulses: 300 mg IV Adults – Ventricular arrhythmias with a pulse: 150 mg over 10 minutes Maintenance Infusion: As with any Aniarrhythmic a maintenance infusion is required. However it is seldom used in the prehospital setting
ROUTES:	IV, Oral
PEDIATRIC DOSAGE:	Not recommended

Amrinone (Inocor)

CLASS:	Cardiac inotrope.
ACTIONS:	Increases cardiac contractility, vasodilator.
INDICATIONS:	Short-term management of severe CHF.
CONTRAINDICATIONS:	Patients with history of hypersensitivity to the drug.
PRECAUTIONS:	May increase myocardial ischemia. Blood pressure, pulse, and EKG should be constantly monitored. Amrinone should only be diluted with normal saline or 1/2 normal saline; no dextrose solutions should be used. Furosemide (Lasix) should not be administered into an IV line delivering Amrinone.
SIDE EFFECTS:	Reduction in platelets, nausea and vomiting cardiac arrhythmias.
DOSAGE:	0.75 mg/kg bolus given slowly over 2-3 minute interval followed by maintenance infusion of 2-15 µg/kg/minute.
ROUTES:	IV bolus and infusion as described earlier.
PEDIATRIC DOSAGE:	Safety in children has not been established.

Aspirin (Bufferin)

CLASS:	Platelet inhibitor/anti-inflammatory.
ACTIONS:	Blocks platelet aggregation.
INDICATIONS:	New-onset chest pain suggestive of MI signs and symptoms suggestive or recent CVA.
CONTRAINDICATIONS:	Patients with history of hypersensitivity to the drug.
PRECAUTIONS:	GI bleeding and upset.
SIDE EFFECTS:	Heartburn, nausea and vomiting, wheezing.
DOSAGE:	150-325 mg PO or chewed.
ROUTES:	PO.
PEDIATRIC DOSAGE:	not recommended.

Atropine

CLASS:	Parasympatholytic (anticholinergic).
ACTIONS:	Blocks acetylcholine receptors, increases heart rate, decreases gastrointestinal secretions.
INDICATIONS:	Hemodynamically-significant bradycardia, hypotension secondary to bradycardia, asystole, organophosphate poisoning.
CONTRAINDICATIONS:	None when used in emergency situations.
PRECAUTIONS:	Dose of 0.04 mg/kg should not be exceeded except in cases of organophosphate poisonings, tachycardia, hypertension.
SIDE EFFECTS:	Palpitations and tachycardia, headache, dizziness, and anxiety, dry mouth, pupillary dilation, and blurred vision, urinary retention (especially older males).
DOSAGE:	Bradycardia: 0.5 mg every 5 minutes to maximum of 0.04 mg/kg. Asystole: 1 mg. Organophosphate poisoning: 2-5 mg.
ROUTES:	IV, ET (ET dose is 2 - 2.5 times IV dose).
PEDIATRIC DOSAGE:	Bradycardia: 0.02 mg/kg Maximum single dose (child 0.5 mg) (adolescent 1.0 mg) Maximum total dose (child 1.0 mg) (adolescent 2.0 mg)

Bretylium (Bretylol)

CLASS:	Antiarrhythmic.
ACTIONS:	Increases ventricular fibrillation threshold, blocks the release of Norepinephrine from peripheral, sympathetic nerves.
INDICATIONS:	Ventricular fibrillation refractory to Lidocaine, ventricular tachycardia refractory to Lidocaine, PCVs refractory to first-line medications.
CONTRAINDICATIONS:	None when used in the management of life-threatening arrhythmias.
PRECAUTIONS:	Postural hypotension occurs in almost 50% of patients receiving Bretylium. Patient must be kept supine decrease dosage in patients being treated with catecholamine sympathomimetics.
SIDE EFFECTS:	Hypotension, syncope, and bradycardia, Increased frequency of arrhythmias, dizziness and vertigo.
DOSAGE:	5 mg/kg. may be repeated at dose of 10 mg/kg up to a total dose of 30 mg/kg.
ROUTES:	Rapid IV bolus.
PEDIATRIC DOSAGE:	5 mg/kg

Calcium Chloride (CaCl)

CLASS:	Electrolyte.
ACTIONS:	Increases cardiac contractility.
INDICATIONS:	Acute hyperkalemia (elevated potassium), acute hypocalcemia (decreased calcium), calcium channel blocker (Nifedipine, Verapamil, etc.), overdose, abdominal muscle spasm associated with spider bite and portuguese man-o-war stings, antidote for magnesium sulfate.
CONTRAINDICATIONS:	Patients receiving digitalis.
PRECAUTIONS:	IV line should be flushed between calcium chloride and sodium bicarbonate administration. Extravasation may cause tissue necrosis.
SIDE EFFECTS:	Arrhythmias (bradycardia and asystole), hypotension.
DOSAGE:	2-4 mg/kg of a 10% solution; may be repeated at 10-minute intervals.
ROUTES:	IV.
PEDIATRIC DOSAGE:	5-7 mg/kg of a 10% solution.

Dexamethasone (Decadron, Hexadrol)

CLASS:	Steroid.
ACTIONS:	Possibly decreases cerebral edema, anti-inflammatory, suppresses immune response (especially in allergic reactions).
INDICATIONS:	Cerebral edema, anaphylaxis (after Epinephrine and diphenhydramine), asthma, COPD.
CONTRAINDICATIONS:	None in the emergency setting.
PRECAUTIONS:	Should be protected from heat, onset of action may be 2-6 hours and thus should not be considered to be of use in the critical first hour following an anaphylactic reaction.
SIDE EFFECTS:	Gastrointestinal bleeding, prolonged wound healing.
DOSAGE:	4-24 mg.
ROUTES:	IV.
PEDIATRIC DOSAGE:	0.2-0.5 mg/kg

Dextrose 50%

CLASS:	Carbohydrate.
ACTIONS:	Elevates blood glucose level rapidly.
INDICATIONS:	Hypoglycemia.
CONTRAINDICATIONS:	None in the emergency setting.
PRECAUTIONS:	A blood sample should be drawn before administering 50% dextrose.
SIDE EFFECTS:	Local venous irritation.
DOSAGE:	25 grams (50 ml).
ROUTES:	IV.
PEDIATRIC DOSAGE:	0.5 g/kg slow IV; should be diluted 1:1 with sterile water to form a 25% solution.

Diazepam (Valium)

CLASS:	Tranquilizer (Benzodiazepine).
ACTIONS:	Anticonvulsant, skeletal muscle relaxant, sedative.
INDICATIONS:	Generalized seizures, status epilepticus, premedication before cardioversion, skeletal muscle relaxant, acute anxiety states.
CONTRAINDICATIONS:	Patients with a history of hypersensitivity to the drug.
PRECAUTIONS:	Can cause local venous irritation. Has short duration of effect. Do not mix with other drugs because of possible precipitation problems.
SIDE EFFECTS:	Drowsiness, hypotension, respiratory depression, apnea.
DOSAGE:	Status epilepticus: 5-10 mg IV. Acute anxiety: 2-5 mg IM or IV. Premedication before cardioversion: 5-15 mg IV.
ROUTES:	IV (care must be taken not to administer faster than 1 ml/min) IM rectal.
PEDIATRIC DOSAGE:	Status epilepticus: 0.1 - 0.2 mg/kg.

Digoxin (Lanoxin)

CLASS: Cardiac glycoside.

ACTIONS: Increases cardiac contractil

Diltiazem (Cardizem)

CLASS:	Calcium channel blocker.
ACTIONS:	Slows conduction through the AV node, causes vasodilation, decreases rate of ventricular response, decreases myocardial oxygen demand.
INDICATIONS:	To control rapid ventricular response associated with atrial fibrillation and flutter.
CONTRAINDICATIONS:	Hypotension, wide complex tachycardia, conduction system disturbances.
PRECAUTIONS:	Should not be used in patients receiving intravenous β blockers. Hypotension. Must be kept refrigerated or discarded one month after removal from refrigeration.
SIDE EFFECTS:	Nausea, vomiting, hypotension, and dizziness.
DOSAGE:	0.25 mg/kg bolus (typically 20 mg) IV over 2 minutes. This should be followed by a maintenance infusion of 5-15 mg/hour.
ROUTES:	IV, IV drip.
PEDIATRIC DOSAGE:	Rarely used.

Dimenhydrinate (Dramamine)

CLASS:	Antihistamine.
ACTIONS:	Blocks histamine receptors, antiemetic.
INDICATIONS:	Nausea and vomiting, motion sickness, to potentiate the effects of analgesics.
CONTRAINDICATIONS:	Comatose states, patients who have received large amounts of depressants (including alcohol).
PRECAUTIONS:	Use with caution in patients with seizure disorders, asthma.
SIDE EFFECTS:	May impair mental and physical ability, drowsiness, bronchial secretions.
DOSAGE:	25-50 mg slow IVP (over 2 minutes) 50 - 100 mg IM.
ROUTES:	IV, IM.
PEDIATRIC DOSAGE:	Not recommended.

Diphenhydramine (Benadryl)

CLASS:	Antihistamine.
ACTIONS:	Blocks histamine receptors, has some sedative effects.
INDICATIONS:	Anaphylaxis, allergic reactions, dystonic reactions due to phenothiazines.
CONTRAINDICATIONS:	Asthma, nursing mothers.
PRECAUTIONS:	Hypotension.
SIDE EFFECTS:	Sedation, dries bronchial secretions, blurred vision, headache, palpitations.
DOSAGE:	25-50 mg.
ROUTES:	Slow IV push deep IM.
PEDIATRIC DOSAGE:	2-5 mg/kg.

Dobutamine (Dobutrex)

CLASS:	Sympathomimetic.
ACTIONS:	Increases cardiac contractility, little chronotropic activity.
INDICATIONS:	Short-term management of congestive heart failure.
CONTRAINDICATIONS:	Should only be used in patients with an adequate heart rate.
PRECAUTIONS:	Ventricular irritability. Use with caution following myocardial infarction. Can be deactivated by alkaline solutions.
SIDE EFFECTS:	Increased heart rate, palpitations.
DOSAGE:	2.5-20 mg/kg/minute. Method: 250 mg should be placed in 500 ml of d5w, which gives a concentration of 0.5 mg/ml.
ROUTES:	IV drip.
PEDIATRIC DOSAGE:	2 - 20 mg /kg/min.

Dopamine (Intropin)

CLASS:	Sympathomimetic.
ACTIONS:	Increases cardiac contractility, causes peripheral vasoconstriction.
INDICATIONS:	Hemodynamically significant hypotension (systolic BP of 70-100 mmhg) not resulting from hypovolemia, cardiogenic shock.
CONTRAINDICATIONS:	Hypovolemic shock where complete fluid resuscitation has not occurred.
PRECAUTIONS:	Should not be administered in the presence of severe tachyarrhythmias. Should not be administered in the presence of ventricular fibrillation, ventricular irritability. Beneficial effects lost when dose exceeds 20 µg/kg/min.
SIDE EFFECTS:	Ventricular tachyarrhythmias, hypertension, palpitations.
DOSAGE:	2-20 µg/kg/minute. Start low and increase as needed. Method: 400 mg should be placed in 250 ml of D5W giving a concentration of 1600 µg/ml.
ROUTES:	IV drip only.
PEDIATRIC DOSAGE:	2-20 µg/kg/minute.

Epinephrine 1:1,000

CLASS:	Sympathomimetic.
ACTIONS:	Bronchodilation.
INDICATIONS:	Bronchial asthma, exacerbation of COPD, allergic reactions.
CONTRAINDICATIONS:	Patients with underlying cardiovascular disease, hypertension, pregnancy, patients with tachyarrhythmias.
PRECAUTIONS:	Should be protected from light. Blood pressure, pulse, and EKG must be constantly monitored.
SIDE EFFECTS:	Palpitations and tachycardia, anxiousness, headache, tremor.
DOSAGE:	0.3-0.5 mg.
ROUTES:	Subcutaneous (IV and ET for pediatric cardiac arrest).
PEDIATRIC DOSAGE:	0.01 mg/kg up to 0.3 mg.

Epinephrine 1:10,000

CLASS:	Sympathomimetic.
ACTIONS:	Increases heart rate and automaticity. Increases cardiac contractile force. Increases myocardial electrical activity. Increases systemic vascular resistance. Increases blood pressure. Causes bronchodilation.
INDICATIONS:	Cardiac arrest, anaphylactic shock severe reactive airway disease.
CONTRAINDICATIONS:	Epinephrine 1:10,000 is for intravenous or endotracheal use; it should not be used in patients who do not require extensive resuscitative efforts.
PRECAUTIONS:	Should be protected from light. Can be deactivated by alkaline solutions.
SIDE EFFECTS:	Palpitations, anxiety, tremulousness, nausea and vomiting.
DOSAGE:	cardiac arrest: 0.5-1.0 mg repeated every 3-5 minutes. severe anaphylaxis: 0.3-0.5 mg (3-5 ml); occasionally and Epinephrine drip is required.
ROUTES:	IV, IV drip, ET.
PEDIATRIC DOSAGE:	0.01 mg/kg initially. with subsequent doses, Epinephrine 1:1,000 should be used at a dose of 0.1 mg/kg.

Flumazenil (Romazicon)

CLASS:	Benzodiazepine antagonist.
ACTIONS:	Reverses effects of benzodiazepines.
INDICATIONS:	To reverse CNS, respiratory depression associated with Benzodiazepines.
CONTRAINDICATIONS:	Flumazenil should not be used as a diagnostic agent for Benzodiazepine overdose in the same manner Naloxone is used for narcotic overdose. Known hypersensitivity to the drug.
PRECAUTIONS:	Administer with caution to patients dependent upon Benzodiazepines as it may induce life-threatening Benzodiazepine withdrawal.
SIDE EFFECTS:	Fatigue Headache Nervousness Dizziness.
DOSAGE:	0.2 mg IV over 30 seconds; repeated as needed to a maximum dose of 1.0 mg.
ROUTES:	IV.
PEDIATRIC DOSAGE:	Pediatric data unavailable.

Furosemide (Lasix)

CLASS:	Potent diuretic.
ACTIONS:	Inhibits reabsorption of sodium chloride, promotes prompt diuresis, vasodilation.
INDICATIONS:	Congestive heart failure, pulmonary edema.
CONTRAINDICATIONS:	Pregnancy, dehydration.
PRECAUTIONS:	Should be protected from light, dehydration.
SIDE EFFECTS:	Few in emergency usage.
DOSAGE:	Standard: 40-80 mg. ACLS: 1 mg/kg, max of 100 mg
ROUTES:	IV.
PEDIATRIC DOSAGE:	1 mg/kg.

Glucagon

CLASS:	Hormone (antihypoglycemic agent).
ACTIONS:	Causes breakdown of glycogen to glucose. Inhibits glycogen synthesis. Elevates blood glucose level. Increases cardiac contractile force. Increases heart rate.
INDICATIONS:	Hypoglycemia.
CONTRAINDICATIONS:	Hypersensitivity to the drug.
PRECAUTIONS:	Only effective if there are sufficient stores of Glycogen within the liver. Use with caution in patients with cardiovascular or renal disease. Draw blood glucose before administration.
SIDE EFFECTS:	Few in emergency situations.
DOSAGE:	0.25-0.50 mg (unit) IV 1.0 mg, IM.
ROUTES:	IV, IM.
PEDIATRIC DOSAGE:	0.03 mg/kg.

Haloperidol (Haldol)

CLASS:	Major tranquilizer.
ACTIONS:	Blocks dopamine receptors in brain responsible for mood and behavior has antiemetic properties.
INDICATIONS:	Acute psychotic episodes.
CONTRAINDICATIONS:	Should not be administered in the presence of other sedatives. Should not be used in the management of dysphoria caused by Talwin.
PRECAUTIONS:	Orthostatic hypotension.
SIDE EFFECTS:	Physical and mental impairment, Parkinson-like reactions have been known to occur, especially in children.
DOSAGE:	2-5 mg.
ROUTES:	IM.
PEDIATRIC DOSAGE:	Rarely used.

Heparin

CLASS:	Anticoagulant.
ACTIONS:	Functions as an anticoagulant by accelerating neutralization of activated clotting factors.
INDICATIONS:	Situations where a hypocoaguable state is required (i.e. post MI, post-CVA, pulmonary embolism).
CONTRAINDICATIONS:	Should not be used unless there is a medical reason to anticoagulate the patient.
PRECAUTIONS:	Sever, urticaria, and anaphylaxis have been reported following heparin administration skin necrosis can develop at site of sub-Q injections.
SIDE EFFECTS:	Fever, bruising, oozing of blood.
DOSAGE:	Loading dose: 5,000 iu IV is a typical loading dose although large patients and patients with heparin resistance may receive larger doses. Maintenance dose: Infusion therapy is typically started at 800 - 1,000 iu/hour. the dosage is modified based upon the patient's prothrombin (pt) time.
ROUTES:	IV subQ (for prophylaxis).
PEDIATRIC DOSAGE:	Rarely used.

Hydroxyzine (Vistaril)

CLASS:	Antihistamine.
ACTIONS:	Antiemetic, antihistamine, antianxiety, potentiates analgesic effects of narcotics and related agents.
INDICATIONS:	To potentiate the effects of narcotics and synthetic narcotics, nausea and vomiting, anxiety reactions.
CONTRAINDICATIONS:	Patients with a history of hypersensitivity to the drug.
PRECAUTIONS:	Orthostatic hypotension, analgesic dosages should be reduced when used with Hydroxyzine, urinary retention.
SIDE EFFECTS:	Drowsiness.
DOSAGE:	50-100 mg.
ROUTES:	Deep IM.
PEDIATRIC DOSAGE:	1 mg/kg.

Insulin (Humulin)

CLASS:	Hormone (hypoglycemic agent).
ACTIONS:	Causes uptake of glucose by the cells, decreases blood glucose level, promotes glucose storage.
INDICATIONS:	Elevated blood glucose, diabetic ketoacidosis.
CONTRAINDICATIONS:	Avoid overcompensation of blood glucose level; if possible, administration should wait until the patient is in the emergency department.
PRECAUTIONS:	Administration of excessive dose may induce hypoglycemia. Glucose should be available.
SIDE EFFECTS:	Few in emergency situations.
DOSAGE:	10-25 units regular insulin IV followed by an infusion at 0.1 units/kg/hr.
ROUTES:	IV, SQ
PEDIATRIC DOSAGE:	Dosage is based on blood glucose level.

Ipratropium (Atrovent)

CLASS:	Anticholinergic.
ACTIONS:	Causes bronchodilation, dries respiratory tract secretions.
INDICATIONS:	Bronchial asthma, reversible bronchospasm associated with chronic bronchitis and emphysema.
CONTRAINDICATIONS:	Patients with history of hypersensitivity to the drug, should not be used as primary agent in acute treatment of bronchospasm.
PRECAUTIONS:	Blood pressure, pulse, and EKG must be constantly monitored.
SIDE EFFECTS:	Palpitations, dizziness, anxiety, tremors, headache, nervousness, dry mouth.
DOSAGE:	Small-volume nebulizer: 500 µg should be placed in small volume nebulizer (typically administered with a β agonist).
ROUTES:	Inhalation only.
PEDIATRIC DOSAGE:	Safety in children has not been established.

Isoetharine (Bronkosol)

CLASS:	Sympathomimetic (β_2 selective).
ACTIONS:	Bronchodilation, increases heart rate.
INDICATIONS:	Asthma, reversible bronchospasm associated with chronic bronchitis and emphysema.
CONTRAINDICATIONS:	Patients with history of hypersensitivity to the drug.
PRECAUTIONS:	Blood pressure, pulse, and EKG must be constantly monitored.
SIDE EFFECTS:	Palpitations, tachycardia, anxiety and tremors, headache.
DOSAGE:	Hand nebulizer: four inhalations. Small-volume nebulizer: 0.5 ml (1:3 with saline).
ROUTES:	Inhalation only.
PEDIATRIC DOSAGE:	0.25-0.5 ml diluted with 4 ml normal saline.

Ketorolac (Toradol)

CLASS:	Non-steroidal anti-inflammatory agent.
ACTIONS:	Anti-inflammatory, analgesic (peripherally-acting).
INDICATIONS:	Mild to moderate pain.
CONTRAINDICATIONS:	Patients with a history of hypersensitivity to the drug, patients allergic to Aspirin.
PRECAUTIONS:	GI irritation or hemorrhage can occur.
SIDE EFFECTS:	Edema, rash, heartburn.
DOSAGE:	IV 15-30 mg, IM 30-60 mg.
ROUTES:	IV, IM.
PEDIATRIC DOSAGE:	Safety in children has not been established.

Labetalol (Trandate) (Normodyne)

CLASS:	Sympathetic blocker.
ACTIONS:	Selectively blocks α_1 receptors and nonselectively blocks β receptors.
INDICATIONS:	Hypertensive crisis.
CONTRAINDICATIONS:	Bronchial asthma, congestive heart failure, heart block, bradycardia, cardiogenic shock.
PRECAUTIONS:	Blood pressure, pulse, and EKG must be constantly monitored. Atropine and transcutaneous pacing should be available.
SIDE EFFECTS:	Bradycardia, heart block, congestive heart failure, bronchospasm, postural hypotension.
DOSAGE:	Method 1: 20 mg by slow IV infusion over 2 minutes; doses of 40 mg can be repeated in 10 minutes until desired supine blood pressure is obtained or until 300 mg of the drug has been given. Method 2: 200 mg placed in 500 ml d5w to deliver 2 mg/minute.
ROUTES:	IV infusion or slow IV bolus as described earlier.
PEDIATRIC DOSAGE:	Safety in children has not been established.

Lidocaine (Xylocaine)

CLASS:	Antiarrhythmic.
ACTIONS:	Suppresses ventricular ectopic activity, increases ventricular fibrillation threshold, reduces velocity of electrical impulse through conductive system.
INDICATIONS:	Malignant PVCs, ventricular tachycardia, ventricular fibrillation, prophylaxis of arrhythmias associated with acute myocardial infarction and thrombolytic therapy, premedication prior to rapid sequence induction.
CONTRAINDICATIONS:	High-degree heart blocks, PVCs in conjunction with bradycardia.
PRECAUTIONS:	Dosage should not exceed 300 mg/hr. Monitor for CNS toxicity. Dosage should be reduced by 50% in patients older than 70 years of age or who have liver disease in cardiac arrest, use only bolus therapy.
SIDE EFFECTS:	Anxiety, drowsiness, dizziness, and confusion, nausea and vomiting, convulsions, widening of QRS.
DOSAGE:	Bolus: Initial bolus of 1.5 mg/kg; additional boluses of 0.5 – 0.75 mg/kg can be repeated at 8-10-minute intervals until the arrhythmia has been suppressed or until 3 mg/kg of the drug has been administered; reduce dosage by 50% in patients older than 70 years of age.
DRIP:	After the arrhythmia has been suppressed a 2-4 mg/minute infusion may be started to maintain adequate blood levels.
ROUTES:	IV bolus, IV infusion.
PEDIATRIC DOSAGE:	1 mg/kg.

Lorazepam (Ativan)

Class	Tranquilizer
Actions	Anticonvulsant Sedative
Indications	Major motor seizures Status epilepticus Premedication before cardioversion Acute anxiety states
Contraindication	Patients with a history of hypersensitivity to the drug
Precautions	Has short duration of effect Do not mix with other drugs because of possible precipitation problems Flumazenil (Romazicon) should be available Dilute with normal saline or D ₅ W prior to intravenous (IV) administration
Side Effects	Drowsiness Hypotension Respiratory depression and apnea
Dosage	0.5-2.0 mg IV; may be increased to 1.0-4.0 mg IV
Routes	IV, intramuscular (IM), rectal
Pediatric Dosage	0.05-0.10 mg/kg (maximum dose 4 mg)

Magnesium Sulfate

CLASS:	Anticonvulsant/Antiarrhythmic.
ACTIONS:	CNS depressant, anticonvulsant, antiarrhythmic.
INDICATIONS:	Obstetrical eclampsia (toxemia of pregnancy), pre-eclampsia/PIH, cardiovascular severe refractory ventricular fibrillation, pulseless ventricular tachycardia, post-MI as prophylaxis for arrhythmias, torsades de pointes (multi-axial ventricular tachycardia).
CONTRAINDICATIONS:	Shock, heart block.
PRECAUTIONS:	Caution should be used in patients receiving digitalis. Hypotension. Calcium Chloride should be readily available as an antidote if respiratory depression ensues. Use with caution in patients in renal failure.
SIDE EFFECTS:	Respiratory depression, drowsiness.
DOSAGE:	1-4 g.
ROUTES:	IV, IM.
PEDIATRIC DOSAGE:	Not indicated.

Mannitol (Osmotrol)

CLASS:	Osmotic diuretic
ACTIONS:	Decreases cellular edema Increases urinary output
INDICATIONS:	Acute cerebral edema Blood transfusion reactions
CONTRAINDICATIONS:	Pulmonary edema Patients who are dehydrated Hypersensitivity to the drug
PRECAUTIONS:	Rapid administration can cause circulatory overload Crystallization of the drug can occur at lower temperatures
SIDE EFFECTS:	Pulmonary congestion Sodium depletion Transient volume overload
DOSAGE:	1.5 – 2.0 g/kg
ROUTES:	Slow IV bolus or infusion
PEDIATRIC DOSAGE:	0.25 – 0.5 g/kg IV over 60 minutes

Methylprednisolone (Solu-Medrol)

CLASS:	Steroid.
ACTIONS:	Anti-inflammatory, suppresses immune response (especially in allergic reactions).
INDICATIONS:	Severe anaphylaxis, asthma/COPD, possibly effective as an adjunctive agent in the management of spinal cord injury.
CONTRAINDICATIONS:	None in the emergency setting.
PRECAUTIONS:	Must be reconstituted and used promptly. Onset of action may be 2-6 hours and thus should not be expected to be of use in the critical first hour following an anaphylactic reaction.
SIDE EFFECTS:	GI bleeding, prolonged wound healing, suppression of natural steroids.
DOSAGE:	General usage: 125-250 mg. Spinal cord injury: Initial bolus of 30 mg/kg administered over 15 minutes, followed by a maintenance infusion of 5.4 mg/kg/hr.
ROUTES:	IV, IM.
PEDIATRIC DOSAGE:	30 mg/kg.

Midazolam (Versed)

CLASS:	Benzodiazepine tranquilizer.
ACTIONS:	Hypnotic, sedative.
INDICATIONS:	Premedication prior to cardioversion/RSI, acute anxiety states.
CONTRAINDICATIONS:	Patients with known hypersensitivity to the drug, narrow-angle glaucoma, shock.
PRECAUTIONS:	Emergency resuscitation equipment should be available. Flumazenil (Romazicon) should be available. Dilute with normal saline or D5W prior to intravenous administration. Respiratory depression more common with Midazolam than with other Benzodiazepines.
SIDE EFFECTS:	Drowsiness Hypotension Amnesia Respiratory depression Apnea
DOSAGE:	1.0 - 5.0 mg IV.
ROUTES:	IV PO Intranasal
PEDIATRIC DOSAGE:	0.03 mg/kg.

Morphine

CLASS:	Narcotic.
ACTIONS:	CNS depressant, causes peripheral vasodilation, decreases sensitivity to pain.
INDICATIONS:	Severe pain, pulmonary edema.
CONTRAINDICATIONS:	Head injury, volume depletion undiagnosed abdominal pain, patients with history of hypersensitivity to the drug.
PRECAUTIONS:	Respiratory depression (narcain should be available), hypotension, nausea.
SIDE EFFECTS:	Dizziness, altered level of consciousness.
DOSAGE:	IV: 2-5 mg followed by 2 mg every few minutes until the pain is relieved or until respiratory depression ensues. IM: 5-15 mg based on patient weight.
ROUTES:	IV, IM.
PEDIATRIC DOSAGE:	0.1-0.2 mg/kg IV.

Nalbuphine (Nubain)

CLASS:	Synthetic analgesic.
ACTIONS:	CNS depressant, decreases sensitivity to pain.
INDICATIONS:	Moderate to severe pain.
CONTRAINDICATIONS:	Patients with a history of hypersensitivity to the drug.
PRECAUTIONS:	Use with caution in patients with impaired respiratory function, respiratory depression (Naloxone should be available). Patients dependent on narcotics may experience, symptoms of withdrawal, nausea.
SIDE EFFECTS:	Dizziness, altered level of consciousness.
DOSAGE:	5-10 mg.
ROUTES:	IV, IM.
PEDIATRIC DOSAGE:	Rarely used.

Naloxone (Narcan)

CLASS:	Narcotic antagonist.
ACTIONS:	Reverses effects of narcotics.
INDICATIONS:	Narcotic overdoses including the following: Codeine, Demerol, Dilaudid, Fentanyl, Heroin, Lortabs, Methadone, Morphine, Paregoric, Percodan, Tylox, Vicodin, synthetic analgesics, Overdoses including the following: Darvon, Nubain, Stadol, Talwin, alcoholic coma, To rule out narcotics in coma of unknown origin.
CONTRAINDICATIONS:	Patients with a history of hypersensitivity to the drug.
PRECAUTIONS:	Should be administered with caution to patients dependent on narcotics as it may cause withdrawal effects. Short-acting, should be augmented every 5 minutes.
SIDE EFFECTS:	none.
DOSAGE:	1-2 mg.
ROUTES:	IV, IM ET (ET dose is 2.0-2.5 times IV dose).
PEDIATRIC DOSAGE:	< 5 years old: 0.1 mg/kg > 5 years old: 2.0 mg.

Nifedipine (Procardia)

CLASS:	Calcium channel blocker.
ACTIONS:	Relaxes smooth muscle causing arteriolar vasodilation decreases peripheral vascular resistance.
INDICATIONS:	Severe hypertension, angina pectoris.
CONTRAINDICATIONS:	Known hypersensitivity to the drug, hypotension.
PRECAUTIONS:	Blood pressure should be constantly monitored. May worsen congestive heart failure. Nifedipine should not be administered to patients receiving intravenous beta blockers.
SIDE EFFECTS:	Dizziness, flushing, nausea, headache, and weakness.
DOSAGE:	10 mg sublingually; puncture the capsule several times with a needle and place it under the patient's tongue and have them withdraw the liquid medication.
ROUTES:	Oral, sublingual.
PEDIATRIC DOSAGE:	0.25-0.5 mg/kg.

Nitroglycerin (Nitroglycerin Spray)

CLASS:	Antianginal
ACTIONS:	Smooth-muscle relaxant, decreases cardiac work, dilates coronary arteries, dilates systemic arteries.
INDICATIONS:	Angina pectoris, chest pain associated with myocardial infarction.
CONTRAINDICATIONS:	Hypotension
PRECAUTIONS:	Constantly monitor vital signs. Syncope can occur.
SIDE EFFECTS:	Dizziness, hypotension, headache.
DOSAGE:	One spray administered under the tongue; may be repeated in 3 - 5 minutes; no more than three sprays in a 15-minute period; spray should not be inhaled.
ROUTES:	Sprayed under tongue on mucous membrane.
PEDIATRIC DOSAGE:	Not indicated.

Nitropaste (Nitro-Bid)

CLASS:	Antianginal.
ACTIONS:	Smooth-muscle relaxant, decreases cardiac work, dilates coronary arteries, dilates systemic arteries.
INDICATIONS:	Angina pectoris, chest pain associated with myocardial infarction.
CONTRAINDICATIONS:	Children younger than 12 years of age, hypotension.
PRECAUTIONS:	Constantly monitor blood pressure, syncope, drug must be protected from light, expires quickly once bottle is opened.
SIDE EFFECTS:	Dizziness, hypotension.
DOSAGE:	1/2 to 1 inch
ROUTES:	Topical
PEDIATRIC DOSAGE:	Not indicated

Nitrous Oxide (Nitronox, Entonox)

CLASS:	Gas
ACTIONS:	Central nervous system depressant
INDICATIONS:	Pain of musculoskeletal origin, particularly fractures Burns Suspected ischemic chest pain States of severe anxiety including hyperventilation
CONTRAINDICATIONS:	Patient who cannot comprehend verbal instructions Patients intoxicated with alcohol or drugs Head-injury patients who exhibit and altered mental status COPD: Increases oxygen concentration may cause respiratory depression Thoracic injury suspicious of a pneumothorax Abdominal pain and distention suggestive of a bowel obstruction
PRECAUTIONS:	Use only in well ventilated areas May not operate at low temperatures
SIDE EFFECTS:	Headache Dizziness Giddiness Nausea Vomiting
DOSAGE:	Self Administered only using fixed 50 percent nitrous oxide and 50 percent oxygen blender
ROUTES:	Inhalation
PEDIATRIC DOSAGE:	Self Administered only

Norepinephrine (Levophed)

CLASS:	Sympathomimetic.
ACTIONS:	Causes peripheral vasoconstriction.
INDICATIONS:	Hypotension refractory to other sympathomimetics, neurogenic shock.
CONTRAINDICATIONS:	Hypotensive states due to hypovolemia.
PRECAUTIONS:	Can be deactivated by alkaline solutions. Constant monitoring of blood pressure is essential. Extravasation can cause tissue necrosis.
SIDE EFFECTS:	Anxiety, palpitations, hypertension.
DOSAGE:	0.5-30 $\mu\text{g}/\text{minute}$. Method: 8 mg should be placed in 500 ml of D5W, giving a concentration of 16 $\mu\text{g}/\text{ml}$.
ROUTES:	IV drip only.
PEDIATRIC DOSAGE:	0.01-0.5 $\mu\text{g}/\text{kg}/\text{minute}$ (rarely used).

Oxygen (O₂)

CLASS:	Gas.
ACTIONS:	Necessary for cellular metabolism.
INDICATIONS:	Hypoxia.
CONTRAINDICATIONS:	None.
PRECAUTIONS:	Use cautiously in patients with COPD, humidify when providing high-flow rates.
SIDE EFFECTS:	Drying of mucous membranes.
DOSAGE:	Cardiac arrest: 100%. Other critical patients: 100%. COPD: 35%.
ROUTES:	Inhalation.
PEDIATRIC DOSAGE:	24-100% as required.

Oxytocin (Pitocin)

CLASS:	Hormone (oxytocic)
ACTIONS:	Causes uterine contraction Causes lactation Slows postpartum vaginal bleeding
INDICATIONS:	Postpartum vaginal bleeding
CONTRAINDICATIONS:	Any condition other than postpartum vaginal bleeding. Cesarean section
PRECAUTIONS:	Essential to ensure that the placenta has delivered and that there is not another fetus before administration oxytocin. Overdose can cause uterine rupture Hypertension
SIDE EFFECTS:	Anaphylaxis Cardiac arrhythmias
DOSAGE:	<i>Intravenous (IV):</i> 10 – 20 units in 500 mL of D5W administered according to uterine response <i>Intramuscular (IM):</i> 3-10 units
ROUTES:	IV drip IM
PEDIATRIC DOSAGE:	Not indicated

Phenytoin (Dilantin)

CLASS:	Anticonvulsant/antiarrhythmic.
ACTIONS:	Inhibits spread of seizure activity through motor cortex, antiarrhythmic.
INDICATIONS:	Status epilepticus, arrhythmias due to digitalis toxicity.
CONTRAINDICATIONS:	Any arrhythmia except those due to digitalis toxicity, patients with history of hypersensitivity to the drug.
PRECAUTIONS:	Should not be administered with glucose solutions. Hypotension. EKG monitoring during administration is essential.
SIDE EFFECTS:	Local venous irritation, central nervous system depression.
DOSAGE:	Status epilepticus: 150-250 mg (10-15 mg/kg) not to exceed 50 mg/minute. Digitalis toxicity: 100 mg over 5 minutes until the arrhythmia is suppressed or until symptoms of central nervous system depression occur.
ROUTES:	IV (dilute with saline).
PEDIATRIC DOSAGE:	Status epilepticus: 8-10 mg/kg IV. Digitalis toxicity: 3-5 mg/kg IV over 10 minutes.

Procainamide (Pronestyl)

CLASS:	Antiarrhythmic.
ACTIONS:	Slows conduction through myocardium, elevates ventricular fibrillation threshold, suppresses ventricular ectopic activity.
INDICATIONS:	Persistent cardiac arrest due to ventricular fibrillation and refractory to Lidocaine, PVCs refractory to Lidocaine, ventricular tachycardia refractory to Lidocaine.
CONTRAINDICATIONS:	High-degree heart blocks, PVCs in conjunction with bradycardia.
PRECAUTIONS:	Dosage should not exceed 17 mg/kg. Monitor for central nervous system toxicity.
SIDE EFFECTS:	Anxiety, nausea, convulsions, widening of QRS.
DOSAGE:	Initial: 20 mg/minute until arrhythmia abolished, hypotension ensues, QRS widened by 50% of original width total of 17 mg/kg has been given. Maintenance: 1-4 mg/minute.
ROUTES:	Slow IV bolus, IV drip.
PEDIATRIC DOSAGE:	Rarely used.

Prochlorperazine (Compazine)

CLASS:	Phenothiazine antiemetic.
ACTIONS:	Antiemetic.
INDICATIONS:	Nausea and vomiting, acute psychosis.
CONTRAINDICATIONS:	Comatose states, patients who have received a large amount of depressants (including alcohol), patients with a history of hypersensitivity to the drug.
PRECAUTION:	EPS (extra-pyramidal seizure) (dystonic) reactions have been reported.
SIDE EFFECTS:	May impair mental and physical ability, drowsiness.
DOSAGE:	5-10 mg slow IV or IM.
ROUTES:	IV, IM.
PEDIATRIC DOSAGE:	Not recommended.

Promethazine (Phenergan)

CLASS:	Antihistamine (h1 antagonist).
ACTIONS:	Mild anticholinergic activity, antiemetic, potentiates actions of analgesics.
INDICATIONS:	Nausea and vomiting, motion sickness, to potentiate the effects of analgesics, sedation.
CONTRAINDICATIONS:	Comatose states, patients who have received a large amount of depressants (including alcohol).
PRECAUTIONS:	Avoid accidental intra-arterial injection.
SIDE EFFECTS:	May impair mental and physical ability, drowsiness.
DOSAGE:	12.5 - 25 mg.
ROUTES:	IV.
PEDIATRIC DOSAGE:	0.5 mg/kg.

Racemic Epinephrine (Micronefrin) (VapoNefrin)

CLASS:	Sympathomimetic.
ACTIONS:	Bronchodilation, increases heart rate, increases cardiac contractile force.
INDICATIONS:	Croup (laryngotracheobronchitis).
CONTRAINDICATIONS:	Epiglottitis, hypersensitivity to the drug.
PRECAUTIONS:	Vital signs should be constantly monitored. Should be used only once in the prehospital setting.
SIDE EFFECTS:	Palpitations, anxiety, headache.
DOSAGE:	0.5-0.75 ml of a 2.25% solution in 2.0 ml normal saline.
ROUTES:	Inhalation only (small-volume nebulizer).
PEDIATRIC DOSAGE:	0.25-0.75 ml of a 2.25% solution in 2.0 ml normal saline.

Sodium Bicarbonate

CLASS:	Alkalinizing agent.
ACTIONS:	Combines with excessive acids to form a weak volatile acid, increases ph.
INDICATIONS:	Late in the management of cardiac arrest, if at all, tricyclic antidepressant overdose, severe acidosis refractory to hyperventilation.
CONTRAINDICATION:	Alkalotic states.
PRECAUTIONS:	Correct dosage is essential to avoid overcompensation of ph. Can deactivate catecholamines. Can precipitate with calcium preparations. Delivers large sodium load.
SIDE EFFECTS:	Alkalosis.
DOSAGE:	1 mEq/kg initially followed by 0.5 mEq/kg every 10 minutes as indicated by blood gas studies.
ROUTES:	IV.
PEDIATRIC DOSAGE:	1 mEq/kg initially followed by 0.5 mEq/kg every 10 minutes.

Succinylcholine (Anectine)

CLASS:	Neuromuscular blocking agent (depolarizing).
ACTIONS:	Skeletal muscle relaxant, paralyzes skeletal muscles including respiratory muscles.
INDICATIONS:	To achieve paralysis to facilitate endotracheal intubation.
CONTRAINDICATIONS:	Patients with known hypersensitivity to the drug.
PRECAUTIONS:	Should not be administered unless persons skilled in endotracheal intubation are present. Endotracheal intubation equipment must be available. Oxygen equipment and emergency resuscitative drugs must be available. Paralysis occurs within 1 minute and lasts for approximately 8 minutes.
SIDE EFFECTS:	Prolonged paralysis, hypotension, bradycardia.
DOSAGE:	1-1.5 mg/kg (40-100 mg in an adult).
ROUTES:	Rapid IV.
PEDIATRIC DOSAGE:	1 mg/kg.

Terbutaline (Brethine)

CLASS:	Sympathomimetic.
ACTIONS:	Bronchodilator, increases heart rate.
INDICATIONS:	Bronchial asthma, reversible bronchospasm associated with COPD, preterm labor.
CONTRAINDICATIONS:	Patients with known hypersensitivity to the drug.
PRECAUTIONS:	Blood pressure, pulse, and EKG must be constantly monitored.
SIDE EFFECTS:	Palpitations, tachycardia, and PVCs, anxiety, tremor, and headache.
DOSAGE:	Metered-dose inhaler: two inhalations, 1 minute apart. Subcutaneous injection: 0.25 mg; may be repeated in 15-30 minutes.
ROUTES:	Inhalation, subcutaneous injection, IV (preterm labor only).
PEDIATRIC DOSAGE:	0.01 mg/kg subcutaneously.

Thiamine (Vitamin B1)

CLASS:	Vitamin.
ACTIONS:	Allows normal breakdown of glucose.
INDICATIONS:	Coma of unknown origin, alcoholism, delirium tremens.
CONTRAINDICATIONS:	None in the emergency setting.
PRECAUTIONS:	Rare anaphylactic reactions have been reported.
SIDE EFFECTS:	Rare, if any.
DOSAGE:	100 mg.
ROUTES:	IV, IM.
PEDIATRIC DOSAGE:	Rarely indicated.

Torsemide (Demadex)

CLASS:	Potent diuretic.
ACTIONS:	Inhibits reabsorption of sodium chloride, promotes prompt diuresis.
INDICATIONS:	Congestive heart failure, pulmonary edema.
CONTRAINDICATIONS:	Patients with known hypersensitivity to the drug, anuria.
PRECAUTIONS:	Should be used with caution in patients taking NSAIDs, dehydration.
SIDE EFFECTS:	Dizziness, headache, nausea.
DOSAGE:	10-20 mg.
ROUTES:	IV.
PEDIATRIC DOSAGE:	Safety not established.

Vecuronium (Norcuron)

CLASS:	Neuromuscular blocking agent (non-depolarizing).
ACTIONS:	Skeletal muscle relaxant, paralyzes skeletal muscles including respiratory muscles.
INDICATIONS:	To achieve paralysis to facilitate endotracheal intubation.
CONTRAINDICATIONS:	Patients with known hypersensitivity to the drug.
PRECAUTIONS:	<p>Should not be administered unless persons skilled in endotracheal intubation are present.</p> <p>Endotracheal intubation equipment must be available. Oxygen equipment and emergency resuscitative drugs must be available.</p> <p>Paralysis occurs within 1 minute and lasts for approximately 30 minutes.</p>
SIDE EFFECTS:	Prolonged paralysis, hypotension, bradycardia.
DOSAGE:	0.08-0.1 mg/kg.
ROUTES:	IV
PEDIATRIC DOSAGE:	0.1 mg/kg.

Verapamil (Isoptin) (Calan)

CLASS:	Calcium channel blocker.
ACTIONS:	Slows conduction through the AV node, inhibits reentry during PSVT, decreases rate of ventricular response, decreases myocardial oxygen demand.
INDICATIONS:	PSVT.
CONTRAINDICATIONS:	Heart block, conduction system disturbances.
PRECAUTIONS:	Should not be used in patients receiving intravenous β blockers, hypotension.
SIDE EFFECTS:	Nausea, vomiting, hypotension, and dizziness.
DOSAGE:	2.5 - 5.0 mg. a repeat dose of 5 - 10 mg can be administered after 15-30 minutes if PSVT does not convert. maximum dose is 30 mg in 30 minutes.
ROUTES:	IV.
PEDIATRIC DOSAGE:	0-1 year: 0.1-0.2 mg/kg (maximum of 2.0 mg) administered slowly. 1-15 years: 0.1-0.3 mg/kg (maximum of 5.0 mg) administered slowly.