

***NEW MEXICO
EMERGENCY MEDICAL SERVICES
GUIDELINES***



DRUGS

***EMT - BASIC
EMT- INTERMEDIATE
EMT-PARAMEDIC***

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ACETAMINOPHEN

CLASS OF DRUG

Analgesic, Antipyretic

INDICATIONS

1. Fever in pediatric patients during long transports

CONTRAINDICATIONS

1. Hypersensitivity to the drug
2. Hepatic failure or impairment

DRUG INTERACTION

1. Phenothiazines - may produce hypothermia
2. Phenobarbital - increase hepatic toxicity

ADMINISTRATION

Pediatric: [10-15 mg/kg] orally

Not to exceed 50 mg/kg/24 hours

SPECIAL NOTES

1. Acetaminophen use in the scope of practice is intended for fever control in pediatric patients during long transports to prevent febrile seizures.

ACETYLCYSTEINE

CLASS OF DRUG

Mucolytic

INDICATIONS – Authorized for Paramedic monitoring during inter-facility transport

1. Antidote to acetaminophen overdose

CONTRAINDICATIONS

1. Hypersensitivity

DRUG INTERACTION

None

ADMINISTRATION

Follow dosing ordered by sending physician

SPECIAL NOTES

Activated charcoal absorbs acetylcysteine if given PO for acetaminophen ingestion.

ACETYLSALICYLIC ACID (ASA, ASPIRIN)

CLASS OF DRUG

Anti-inflammatory, analgesic, antipyretic, anticoagulant

INDICATIONS

1. Myocardial infarction patients, including suspected AMI patients.

CONTRAINDICATIONS

1. Hypersensitivity
2. Bleeding disorders
3. Asthma (Relative)

ADMINISTRATION

Adult: [162-325 mg] orally for AMI (prefer chewable)

Pediatric: Should not to be given to pediatric patients.

SPECIAL NOTES

1. All patients with suspected AMI and without contraindications receive aspirin.

ACTIVATED CHARCOAL

CLASS OF DRUG

Gastrointestinal Adsorbent

INDICATIONS

1. Activated charcoal is used in the treatment of certain cases of poisoning and over-doses in the alert patient. Most commonly given in the hospital after gastric lavage, but it is appropriate to give in the pre-hospital setting before lavage if a long transport time is anticipated.

CONTRAINDICATIONS

1. Acids or alkali ingestion unless other drugs have ingested.
2. GI obstruction

DRUG INTERACTION

1. Contact MCEP before giving in acetaminophen OD's. Charcoal interferes with the function of N-Acetylcysteine, an antidote for acetaminophen.
2. Milk products-decreases effectiveness.

ADMINISTRATION

Adult: [1 gm/kg] PO. If the quantity of the substance is known, 10 times the amount of ingested substance (by weight). Premix with Sorbitol® is preferred

Pediatric: Same as adult

SPECIAL NOTES

1. The patient must be capable of protecting their airway.

ADENOSINE (ADENOCARD®)

CLASS OF DRUG

Endogenous nucleoside; antidysrhythmic

INDICATIONS

1. Paroxysmal supraventricular tachycardia (PSVT), including PSVT associated with Wolff-Parkinson-White syndrome.

CONTRAINDICATIONS

1. Hypersensitivity
2. High degree A-V block and sick sinus syndrome, unless a pacemaker is in place

DRUG INTERACTION

1. Carbamazepine - increased likelihood of progressive heart blocks.
2. Dipyridamole - potentiates the effect of adenosine (reduce the dosage).
3. Xanthines - reduces effectiveness (a larger dosage may be required).
4. Nicotine - may increase risk of tachycardia.

ADMINISTRATION

Adult: [6 mg] rapid IVP (1-2 seconds) followed with a 30 cc flush. May be repeated in 1-2 minutes, a second dose of [12 mg] rapid IVP followed by a 30 cc flush. Single doses of greater than 12 mg should not be given. May be given up to three times and always follow each bolus with a 30 cc flush.

Pediatric: Initial: [0.1 mg/kg] rapid IVP. Repeat in 2-3 minutes if no change.
Second and third dose at [0.2 mg/kg] rapid IVP.

SPECIAL NOTES

1. Use on patients with asthma, may induce bronchospasms.
2. Safety in pregnancy is unknown.

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ADENOSINE (cont.)

3. Transient dysrhythmias, such as periods of asystole, are common and self-limiting, requiring no treatment unless they persist.
4. Side effects may include: facial flushing, headache, chest pain, dyspnea, lightheadedness, and nausea.
5. Must be given in the IV port most proximal to the patient.

ALBUTEROL (PROVENTIL®, VENTOLIN®)

CLASS OF DRUG

Sympathomimetic, Beta₂ selective adrenergic bronchodilator

INDICATIONS

1. Albuterol is used to treat reversible airway obstruction caused by:
 - a. Wheezing associated with asthma
 - b. COPD (emphysema)
 - c. Chronic bronchitis

CONTRAINDICATIONS

1. Hypersensitivity

DRUG INTERACTION

1. Beta adrenergic agents - potentiates the effects
2. MAO inhibitors - may lead to hypertensive crisis
3. Beta adrenergic blockers - decreases the effectiveness

ADMINISTRATION

Nebulizer

Adult: [2.5-5.0 mg] (up to 10 mg) in 3 ml of sterile NS given as inhalation therapy over 5-15 minutes, may be repeated as necessary.

Pediatric: [1.25-2.5 mg] (up to 5 mg) in 3 ml of sterile NS given as inhalation therapy over 5-15 minutes, may be repeated as necessary.

SPECIAL NOTES

1. Most side effects are dosage related.
2. May decrease arterial oxygen tension acutely by causing bronchodilation in areas of lung with poor blood perfusion
3. Care should be taken if patient is already using an inhalant due to possible development of severe paradoxical airway resistance with repeated excessive use.

AMINOPHYLLINE

CLASS OF DRUG

Xanthine bronchodilator

INDICATIONS (Authorized for monitoring during inter-facility transport)

1. Acute bronchospasm due to asthma
2. Anaphylaxis with bronchospasm
3. Wheezing in older persons, when pulmonary edema is a serious consideration
4. COPD with exacerbation

CONTRAINDICATIONS

1. None, when indicated.

DRUG INTERACTION

1. Smoking, phenytoin, and rifampin - decreases effectiveness.
2. Erythromycin, steroids, and beta-blockers - increases effectiveness - may lead to toxicity.

ADMINISTRATION

Adult: [5-7 mg/kg] IV infusion in 50 ml D₅W over 20 minutes
[0.5 to 0.9 mg/kg per hour] maintenance dose

- a. The lower dose is used for older patients, patients with liver disease, congestive heart failure, hypovolemia, and non-smokers.
- b. The higher ranges are used for children and smokers.

Pediatric: [5-6 mg/kg] IV infusion in 50 ml D₅W over 20 minutes not to exceed 12 mg/kg in a 24 hour period

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AMINOPHYLLINE (cont.)

SPECIAL NOTES

1. Aminophylline monitoring is used only during inter-facility transports.
2. If infused too rapidly, may cause nausea, vomiting, seizures, ventricular fibrillation, and circulatory collapse. Monitor constantly. Do not exceed 25 mg/min.
3. Aminophylline may cause an initial drop in arterial oxygen concentration. **Always have patient on oxygen before administration.**
4. Nausea is an early sign of toxicity. Seizures are a late sign of toxicity.

AMIODARONE (CORDARONE®)

CLASS OF DRUG

Antiarrhythmic

INDICATIONS

1. Pulseless VF/VT refractory to initial electrical therapy
2. Unstable VT refractory to lidocaine and/or electrical therapy

CONTRAINDICATIONS

1. None, if the patient is in cardiac arrest with VF or VT.
2. High degree AV blocks or sinus node dysfunction with marked bradycardia unless a functional pacemaker is in place.
3. Congestive heart failure

DRUG INTERACTION

1. Enhanced bradycardia and hypotension when given with other beta-blockers or calcium channel blockers.

ADMINISTRATION

Adult:

Pulseless VT/VF	[300 mg] initial bolus IVP or IO after epinephrine. May re-bolus with [150mg] once.
Sustained VT	[150 mg] over 10 minutes. May re-bolus every 10 minutes as needed up to a maximum dose of 15 mg/kg/day.
Maintenance infusion:	[0.5 mg/kg], 540 mg IV over 18 hours

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AMIODARONE (cont.)

Pediatric:

Pulseless VT/VF	[5mg/kg] IVP or IO. May re-bolus every 3-5 minutes to a maximum of 20 mg/kg/24 hours
Sustained VT	[5 mg/kg] IVP or IO over 20-60 minutes. May repeat as needed to a maximum dose of 20 mg/kg /24 hours.

SPECIAL NOTES

1. Must be drawn up slowly to avoid "bubbles" do not shake the ampule for the same reason.
2. Must be given concurrently with epinephrine in the pulseless patient.
3. Can not be administered via ET tube.
4. Hypotension and bradycardia can occur on patients with a pulse.

ATROPINE SULFATE

CLASS OF DRUG

Anticholinergic (parasympatholytic)

INDICATIONS

1. Symptomatic sinus bradycardia or A-V Blocks
2. Bradycardia associated with PEA
3. Asystole
4. Anticholinesterase poisonings - organophosphate, mushrooms (certain types), and nerve gases
5. Adjunct in the treatment of bronchial asthma

CONTRAINDICATIONS

1. None, when indicated.

DRUG INTERACTION

1. Antihistamines, tricyclic antidepressants - additive effect

ADMINISTRATION

1. Cardiac Indications:

Adult: [0.5 mg] IV, every 3-5 minutes: max 3.0 mg (0.04 mg/kg) for bradycardia.
[1.0 mg] rapid IVP or IO, [2 to 3 mg diluted in 10ml NS] ET, every 3-5 minutes for (asystole, PEA < 60 bpm)

Pediatric: [0.02 mg/kg] IVP or IO for 2 dosages. Minimum of 0.1 mg and maximum of 0.5 mg

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ATROPINE SULFATE (cont.)

2. Anticholinesterase poisoning:

Adult: [2.0 mg] IVP repeated until symptoms abate

Pediatric: [0.05 mg/kg] IV, ET, or IO, repeated until symptoms abate

3. Mushroom Poisoning:

Adult: [2 mg] IVP, repeated to doses sufficient enough to control parasympathomimetic signs

SPECIAL NOTES

1. May be not be effective with high degree A-V block (2nd degree type II, 3rd degree) - do not delay pacing.
2. Bradycardia in the setting of an acute MI is common and probably beneficial. Don't treat the rate unless there are signs of poor perfusion (i.e. low blood pressure, mental confusion). Chest pain could be due to an AMI or to poor perfusion caused by the bradycardia itself.
3. Atropine increases the workload and myocardial O₂ consumption of heart. Beware of patients who have an ischemic myocardium. Administer supplemental oxygen.

ANTIBIOTICS and other anti-infective agents**CLASS OF DRUG**

Anti-infective

INDICATIONS (Authorized for monitoring during inter-facility transport)

(This is not an exhausted list, just a list of the most common antibiotics).

Aminoglycosides: Gram negative bacteria, bone and joint, soft tissue, Post-op, UTIs, and intra-abdominal infections.

Cephalosporin: Gram positive cocci and limited use against gram negative (*E. coli*).

Chloramphenicol: **NOT TO BE USED IN TRIVIAL INFECTIONS.** Serious infection caused by *Salmonella*, *Rickettsia*, and *Chlamydia*. Meningitis caused by *hemophilus influenza*, and Meningococcal meningitis.

Erythromycin (EES)

And Macrolides: Bacteriostatic against *Streptococcus sp.*, *Staphylococcus aureus*, *Mycoplasma pneumoniae*, *Hemophilus influenza* (when used with sulfonamides), and many others.

Penicillin: Bactericidal against Gram negative bacteria such as *Hemophilus influenza*, *Escherichia coli*, *Proteus mirabilis*, *Neisseria gonorrhoea*; Gram positive organisms such as *Streptococcus*.

Polymyxin: Has potent bactericidal activity against many gram negatives such as *Pseudomonas*, *Proteus*, and *Hemophilus*.

Sulfonamide: Wide bacteriostatic spectrum against gram positives and gram negatives.

Anti-fungal: Wide fungicidal activity against *Candida*, *Trichophyton*, *Epidermophyton*, and *Microsporum*.

Fluoroquinolones: Broad spectrum of activity against gram positive and gram negative bacteria including *pseudomonas* (Ciprofloxacin=Cipro®)

Tetracycline: *Rickettsia*, *Chlamydia*, and *Mycoplasma*. Use to treat syphilis and gonorrhoea for patients who are allergic to PCN.

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ANTIBIOTICS and other anti-infective agents (cont.)

CONTRAINDICATIONS

General: Contraindicated if any history of hypersensitivity to the particular class of antibiotics. Must use another class

Aminoglycosides: Renal or hearing impairment.

Cephalosporin: Use with caution with renal and hepatic impaired patients.

Chloramphenicol: Pregnancy and nursing mothers.

Erythromycin (EES)

And Macrolides: Patients taking Seldane® and other antihistamine(s) may lead to Torsades de Pointes.

Penicillin: Use with caution on patients with hay fever or other allergies.

Polymyxin: Use in pregnancy if benefits outweigh risks.

Sulfonamide: Third trimester pregnancy, nursing mothers, and infants under two months.

Anti-Fungal: None when indicated.

Fluoroquinolones: Children and nursing mothers.

Antitubercular: Isoniazid-use cautions in seizure patients

ADMINISTRATION

Refer to manufacturer's information

SPECIAL NOTES

Refer to manufacturer's information

BETA BLOCKING AGENTS

CLASS OF DRUG

Beta-adrenergic blocker

INDICATIONS (Intra-facility Transport Drug)

1. Used alone or in combination with other agents in the management of hypertension.
2. Management of angina pectoris.
3. Prevention of myocardial infarction.

CONTRAINDICATIONS

1. Uncompensated congestive heart failure.
2. Pulmonary edema
3. Cardiogenic shock
4. Bradycardia or heart block

DRUG INTERACTION

1. General anesthesia, IV Phenytoin, and Verapamil may cause additive myocardial depression.
2. May decrease the beta effects of Dopamine or Dobutamine.
3. Additive bradycardia may occur with digitalis glycosides.
4. Additive hypotension may occur with other antihypertensives, alcohol or nitrates.
5. May alter effectiveness of insulin or oral hypoglycemic agents.
6. May decrease effectiveness of beta-adrenergic bronchodilators.

ADMINISTRATION

1. Selected drug, administration, and drug dosage must be determined by Medical Direction prior to transport.

SPECIAL NOTES

1. Use cautiously within 14 days of MAO inhibitor therapy

BENZODIAZEPINES

DIAZEPAM - VALIUM®, MIDAZOLAM - VERSED®, - LORAZEPAM - ATIVAN®

CLASS OF DRUG

Anticonvulsant, anti-anxiety, sedative, muscle relaxant

INDICATIONS

1. Control of seizures
2. Sedation for cardioversion
3. To facilitate intubation or in conjunction with paralytics for rapid sequence intubation. **(with special skills approval only)**
4. Reduction of anxiety
5. Skeletal muscle relaxant

CONTRAINDICATIONS

1. Hypersensitivity
2. CNS depression

DRUG INTERACTION

1. Additive effect to other CNS depressants such as alcohol, narcotics, etc

ADMINISTRATION

Adults

Diazepam (Valium®): [2-10 mg] IVP, slow with IV running open

Lorazepam (Ativan®): [2 - 4 mg] (0.05 mg/kg) IVP, slow with IV running open

Midazolam (Versed®): [1-5 mg] IVP, slow (over 2 minutes) with IV running open

Note: HIGHER DOSES MAY BE REQUIRED

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BENZODIAZEPINES (cont.)

Pediatric:

Diazepam: > 5 yrs. of age, [1 mg] every 2-5 minutes to a max. of 10 mg. Repeat every 2-4 hrs.

Diazepam: < 5 yrs. of age, [0.2 mg] every 2-5 minutes to a maximum of 5 mg.

- a. Rectal dosage [0.5 mg/kg] may be warranted in seizure patients if no venous access is available. Onset of action by this route may be delayed.
- b. Apnea in children after diazepam administration may occur

Lorazepam: 0.05-0.1 mg/kg IV to a maximum 4 mg. Onset 2-3 minutes. Duration 12-24 hours.

SPECIAL NOTES

1. Should not be mixed with other agents, or diluted with intravenous solutions. Give through the proximal end of IV tubing, then flush well.
2. Most likely to produce respiratory depression on patients who have taken other depressant drugs, especially alcohol and barbiturates.
3. It can cause local venous irritation. Use relatively large veins.
4. Has short half- life. Additional doses may be necessary.
5. **Utilization of pharmacological agents for the primary purpose of sedation, induction, or muscle relaxation to facilitate placement of an advanced airway requires Medical Direction Committee Special Skills approval.**

BLOOD (Packed Red Cells, Fresh Plasma, Whole Blood)

CLASS OF DRUG

Naturally occurring colloid

INDICATIONS (Authorized for monitoring during inter-facility transport)or special situations)

1. To maintain blood volume or replenish blood loss

CONTRAINDICATIONS

1. Non-compatible blood

ADMINISTRATION

1. [10 ml/kg] or based on H/H

SPECIAL NOTES

1. Double check blood ID # and patient ID.
2. Save bags after administration.
3. Save all bags and tubing if there is a reaction, after stopping transfusion.
4. Close monitoring of body temperature is mandatory during infusion.

BRETYLIUM TOSYLATE (BRETYLOL®)

CLASS OF DRUG

Antidysrhythmic

INDICATIONS

1. Ventricular tachycardia and ventricular fibrillation that are refractory to lidocaine and/or defibrillation
2. Serious, ectopic ventricular dysrhythmias refractory to lidocaine, magnesium sulfate, and procainamide
3. Recurrent ventricular fibrillation despite use of epinephrine and defibrillation
4. Wide complex tachycardias, (uncertain origin) that are refractory to lidocaine and adenosine

CONTRAINDICATIONS

1. None if indicated.

DRUG INTERACTION

1. Use cautiously in digitalis toxic patients.

ADMINISTRATION

Adult:

Pulseless VT/VF: Initial - [5 mg/kg] bolus rapid IVP; Repeat dose at [10 mg/kg] every 5 minutes, until 30 to 35 mg/kg has been administered.

VT (with a pulse): Dilute 500 mg in 50 cc NS. Give [5 - 10 mg/kg] IV piggyback, over 8 - 10 minutes (onset of action may be delayed).

IV Infusion
(maintenance): [1 gm] in 250 cc of normal saline or D5W, at 1-2 mg/min

Pediatric:

Same as adult

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BRETYLIUM TOSYLATE (cont.)

SPECIAL NOTES

1. When given to a conscious patient, it will almost always produce nausea, vomiting and hypotension.

CALCIUM PREPARATIONS

CALCIUM GLUCONATE, CALCIUM CHLORIDE, CALCIUM GLUCEPTATE

CLASS OF DRUG

Electrolyte

INDICATIONS

1. Used as antidote for calcium channel blocker overdoses
2. Magnesium sulfate overdoses
3. Black Widow spider bite

CONTRAINDICATIONS

1. Hypercalcemia
2. Absence of indications

DRUG INTERACTION

1. Increase toxicity of cardiac glycoside

ADMINISTRATION

Calcium Gluconate

Adult: [5 - 10 ml] **SLOW** IVP (Do Not Exceed 2 ml/minute) repeat if necessary after 5 - 10 min.

Pediatric: [0.6 ml/kg] **SLOW** IVP of 10% solution

Calcium Chloride:

Adult: [5-10ml] by **SLOW** IVP. Repeat every 10 minutes as needed (1 ml of 10% = 100 mg of calcium chloride).

Pediatric: [0.2 ml/kg] (10% solution) by **SLOW** IVP. Repeat once in 10 minutes if needed.

NOTE: RAPID INJECTION CAN CAUSE HYPOTENSION, BRADYCARDIA AND DEATH.

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CALCIUM PREPARATION (cont.)

SPECIAL NOTES

1. It is best to warm the drug to body temperature prior to administration.
2. If heart is beating, rapid administration of calcium salts can produce bradycardia and/or arrest.
3. May increase cardiac irritability, i.e., PVC's, particularly in the presence of digitalis.
4. Local infiltration will cause tissue necrosis.

CORTICOSTEROIDS

Dexamethasone (Decadron®)

CLASS OF DRUG

Anti-Inflammatory; immunosuppressant

INDICATIONS

1. Brain injury associated with trauma
2. Reactive airway disease with no response to Albuterol and other treatments

CONTRAINDICATIONS

1. Absolute – Hypersensitivity
2. Relative – Hypothyroidism; thromboembolic disorders; active infection

DRUG INTERACTION

None

ADMINISTRATION

Adults – 4-10 mg PO/IV/IM

Pediatrics – 0.6 mg/kg (range 0.15-1.0 mg/kg) PO/IV/IM

SPECIAL NOTES

Compatible in D5W/NS

CORTICOSTEROIDS

Methylprednisolone (Solu-Medrol®)

CLASS OF DRUG

Anti-Inflammatory; immunosuppressant

INDICATIONS

3. Reactive airway disease with no response to Albuterol and other treatments
4. Allergic reactions

CONTRAINDICATIONS

1. Absolute – Hypersensitivity
2. Relative – Immunocompromised state; serious infections; psychotic disorders

DRUG INTERACTION

None

ADMINISTRATION

Adults – 125-250 mg IV q. 6 hours
Pediatrics – 2 mg/kg IV q. 6 hours

SPECIAL NOTES

Adverse effects – hyperglycemia; psychosis

High dose methyl prednisolone is no longer given routinely for spinal cord injury but may occasionally be ordered by a neurosurgeon.

CORTICOSTEROIDS

Prednisone

CLASS OF DRUG

Synthetic corticosteroid

INDICATIONS

1. Exacerbated asthma

CONTRAINDICATIONS

2. Systemic fungal infections

DRUG INTERACTION

1. Additive hypokalemia with thiazides and loop diuretics.
2. May increase requirements for insulin or oral hypoglycemic agents in diabetics.
3. Phenyton, phenobarbital and rifampin may decrease effectiveness.

ADMINISTRATION

Adult: PO [1 mg/kg to a max dose of 60 mg]

SPECIAL NOTES

1. Prednisone suppresses the immune system.
2. Prednisone causes retention of sodium and fluids.

DEXTROSE (Oral and IV - 25% and 50%)

CLASS OF DRUG

Carbohydrate, nutrient, short acting osmotic diuretic

INDICATIONS

1. Symptomatic hypoglycemia
2. Unconsciousness of unknown origin
3. Seizures of:
 - a. Unknown etiology
 - b. New onset of seizures
 - c. Known diabetic actively seizing
4. Refractory medical cardiac arrest (especially in neonates)

CONTRAINDICATIONS

1. Intra-cranial bleeds
2. Delirium tremens with dehydration
3. Administration through the same infusion set as blood.
4. Unconscious (for oral dextrose)
5. Suspected CVA

DRUG INTERACTION

1. None

ADMINISTRATION

1. Oral: [12-25 gm] of paste, may be spread with a tongue depressor.

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DEXTROSE (cont.)

2. IV:

Adult: [25 to 50 gm] slow IV push into patent vein, if patient is unable to protect airway or tolerate oral fluids. May be repeated as needed. Be prepared to restrain. May be given rectally (paramedic only).

Pediatric: Dilute 1:1 with sterile saline to make 25% solution (0.25 mg/ml) Give [0.5 - 1.0 g/kg] slow IV push. May be given rectally (**paramedic only**).

Neonates: Use a **10% Dextrose** solution (dilute 50cc D50 in 500ml bag of D5W) at [0.2 gm/kg].

SPECIAL NOTES

1. Attempts at documenting hypoglycemia via automatic glucometry should be made before administration.
2. Must insure patent IV line, and recheck patency during administration.

DILTIAZEM HCL (CARDIZEM®)

CLASS OF DRUG

Calcium Channel Blocker; Coronary Vasodilator, Antidysrhythmic

INDICATIONS (Authorized for monitoring during inter-facility transport)

1. Atrial Fibrillation or Atrial Flutter
2. Paroxysmal Supraventricular Tachycardia
3. Angina due to coronary artery spasm

CONTRAINDICATIONS

1. Sick sinus syndrome except in the presence of a functioning ventricular pacemaker.
2. Patients with second- or third degree AV block except in the presence of a functioning ventricular pacemaker.
3. Patients with severe hypotension or cardiogenic shock
4. Patients who have demonstrated hypersensitivity to the drug
5. Intravenous diltiazem and intravenous beta-blockers should not be administered together or in close proximity (within a few hours).
6. Patients with atrial fibrillation or atrial flutter associated with an accessory bypass tract such as in WPW syndrome or short PR syndrome
7. Patients with ventricular tachycardia

DRUG INTERACTION

1. Additive effects in prolonging AV conduction when using beta-blockers or digitalis concomitantly with diltiazem HCl.

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DILTIAZEM HCL (cont.)**ADMINISTRATION**

Adult: [0.25 mg/kg] as a bolus administered over 2 minutes (20 mg is a reasonable dose for the average patient). If response is inadequate, a second dose may be administered after 15 minutes. The second bolus dose of diltiazem HCl injectable should be [0.35 mg/kg] actual body weight administered over 2 minutes (25 mg is a reasonable dose for the average patient).

For continued reduction of the heart rate (up to 24 hours) in patients with atrial fibrillation or atrial flutter, an intravenous infusion of diltiazem HCl injectable may be administered. Immediately following bolus administration of [20 mg] (0.25 mg/kg) or [25 mg] (0.35 mg/kg) diltiazem HCl injectable and reduction of heart rate, begin an intravenous infusion of diltiazem HCl injectable. The recommended initial infusion rate of diltiazem HCl injectable is [10 mg/h]. Some patients may maintain response to an initial rate of 5 mg/h. The infusion rate may be increased in 5 mg/h increments up to 15 mg/h as needed, if further reduction in heart rate is required. The infusion may be maintained for up to 24 hours.

Pediatric: Not usually used.

SPECIAL NOTES

1. When given to a conscious patient, they will almost always produce nausea, vomiting and hypotension.

DIPHENHYDRAMINE HCL (BENADRYL®)

CLASS OF DRUG

Antihistamine, H₁ blocker

INDICATIONS

1. Allergic reactions
2. Anaphylaxis
3. Dystonic reaction to phenothiazines
4. Motion sickness

CONTRAINDICATIONS

1. Acute asthma

DRUG INTERACTION

1. Additive CNS depression with alcohol, sedatives, narcotics

ADMINISTRATION

Adults: [20-50 mg], slow IVP at a rate of 1ml/min or deep IM injection

Pediatric: [1 mg/kg], slow IVP; deep IM injection with a maximum dose of 50 mg

SPECIAL NOTES

1. May have an immediate effect in dystonic reactions.
2. No early benefit in allergic reactions

DOBUTAMINE (DOBUTREX®)

CLASS OF DRUG

Sympathomimetic, beta agonist

INDICATIONS (Authorized for monitoring during inter-facility transport)

1. Primary indication is cardiogenic shock, with pulmonary edema.

CONTRAINDICATIONS

1. None when indicated. Use cautiously in AMI and atrial fibrillation.

DRUG INTERACTION

1. Synergistic effect with sodium nitroprusside
2. Reduced effects with Beta-adrenergic blocker
3. Hypertensive crisis with tricyclic antidepressants

ADMINISTRATION (An infusion pump must be used).

Adult: [2 - 20 mcg/kg/min] (mix 1 ampule (250 mg) in 250 ml of D₅W - resulting in a concentration of 1mg/ml = 1000 mcg/ml)

Pediatric: [1.0 mcg/kg per minute] (6 x body weight (kg) equals milligrams to add to D₅W to create a total volume of 100ml). Infuse at 1mL/h.

SPECIAL NOTES

1. Dobutamine should be titrated to effect.

DOPAMINE HYDROCHLORIDE (DOPASTAT®, INTROPIN®)

CLASS OF DRUG

Potent sympathomimetic, dopaminergic

INDICATIONS

1. Primary indication is cardiogenic shock.
2. May be useful for other forms of shock
3. May be useful, at low doses, in renal failure
4. Used for refractory bradycardia unresponsive to atropine, and when pacing is unavailable.

CONTRAINDICATIONS

1. Tachydysrhythmias
2. Pheochromocytoma

DRUG INTERACTION

1. Hypotension and/or bradycardia with phenytoin
2. Reduced effects with Beta-adrenergic blocker

ADMINISTRATION

Adult: IV infusion ONLY - Mix 400 mg in 250 ml D₅W or NS to produce a concentration of 1600 mcg/ml. Infusion rates [2.0-20.0 mcg/kg/min] titrated to desired effect. (Other concentrations are used, so know what you are using). Use microdrip chamber or an infusion pump.

Pediatric: [1.0 mcg/kg per minute] (6 x body weight (kg) equals milligrams to add to D₅W to create a total volume of 100ml). Infuse at 1mL/h.

SPECIAL NOTES

1. Higher doses can cause central vasoconstriction limiting renal blood flow.

EPINEPHRINE (ADRENALINE®) (1:1,000 and 1:10,000 solutions)

CLASS OF DRUG

Sympathomimetic

INDICATIONS

1. Severe Bronchospasm
2. Bronchospasms unresponsive to albuterol
3. Anaphylaxis
4. Cardiac Arrest
5. Symptomatic bradycardia

CONTRAINDICATIONS

1. None when indicated.

DRUG INTERACTION

1. Reduced effects with Beta-adrenergic blocker

ADMINISTRATION

1. Cardiac Arrest

Adult: [1 mg](1:10,000) every 3 - 5 minutes
IV or IO preferred, may be given ET (2 - 2 1/2 times IV dose)

Pediatric: Initial: IV/IO 0.01 mg/kg (1:10,000) every 3-5 minutes
ET 0.1 mg/kg (1:1000)

2. Bradycardia

Adult: [1 mg/ 1:1,000] in 250 cc NS or D₅W administered at
2 - 10 mcg/min

Pediatric: [0.1-0.2 mcg/kg/minute] (0.6 x body weight (kg) equals milligrams to add
to D₅W to create a total volume of 100 m). Infuse at 1mL/h

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EPINEPHRINE (cont.)

3. Bronchospasm/Anaphylaxis

Adult: [0.3 mg] (1:1,000) SQ or IM using a pre-filled device.
[0.3 mg] (1:10,000) IV or 1 mg ET (IF SEVERE OR NO
RESPONSE TO SQ/IM) Repeat PRN (**Paramedic Only**)

Pediatric: [0.01 mg/kg (1:1000)], SQ To a maximum dose of 0.3 mg/dose

SPECIAL NOTES

1. When used for allergic reactions, increased cardiac workload can precipitate angina and/or AMI in susceptible individuals.
2. Due to peripheral vasoconstriction, it should be used with caution on patients with peripheral vascular insufficiency.
3. Wheezing in an elderly person is pulmonary edema or pulmonary embolus until proven otherwise.

EPOPROSTENOL SODIUM (FLOLAN®)

CLASS OF DRUG

Prostaglandin (vasodilator)

INDICATIONS (Administration of patient's own medication only)

1. Management of primary pulmonary hypertension in patients currently being treated with continuous Flolan® infusion.

CONTRAINDICATIONS

1. Patients with a known hypersensitivity.
2. Patients with CHF secondary to left ventricular systolic dysfunction.
3. Patients who develop pulmonary edema secondary to Flolan® use.

DRUG INTERACTION

1. Flolan® is incompatible with all other medications and must be administered through a designated IV line.
2. Added hypotension may occur with antihypertensive, diuretics or other vasodilators.

ADMINISTRATION

1. Flolan® must be reconstituted from powder form with a specific diluents.
2. Specific dosing must be obtained from the patient.

SPECIAL NOTES

1. Most patients treated with Flolan® utilize an ambulatory infusion pump.
2. In the event the patient is found unconscious the patient should be assessed for continuous infusion through a central line. If not, a designated peripheral line should be initiated and infusion continued.

FUROSEMIDE (LASIX®)

CLASS OF DRUG

Potent loop diuretic

INDICATIONS

1. Pulmonary edema
2. Hypertensive emergencies (AMI, APE, or encephalopathy)

CONTRAINDICATIONS

1. Hypovolemia
2. Hypokalemia
3. Hypotension

DRUG INTERACTION

1. Severe hypotension with antihypertensives and nitrates

ADMINISTRATION

Adult: For patients not currently taking furosemide, [20 - 40 mg] slow IVP or [0.5 - 1.0 mg/kg] slow IVP. Use lower dose if no previous exposure to the drug. If the patient is currently taking furosemide, double the PO dose. Patients already on oral diuretics may require higher doses. You may repeat one dose PRN.

Pediatric: [1.0 mg/kg] slow IVP
It may be repeated in 6 - 8 hours.

SPECIAL NOTES

1. It can lead to profound diuresis with resultant shock and electrolyte depletion (particularly K⁺). Therefore, do not use in hypovolemic states and monitor closely, particularly after IV administration.
2. It should be used in children or pregnant women cautiously.
3. If patient unconscious, must have Foley catheter in place and unobstructed urine outflow. Advise the physician if urine is bloody. Trauma to kidneys and urinary system makes the use of furosemide more hazardous.

GLUCAGON

CLASS OF DRUG

Hormone- hyperglycemic agent

INDICATIONS

1. Documented symptomatic hypoglycemia (BGL less than 60 mg/dl) when an IV cannot be started.
2. Beta blocker overdose with serious signs and symptoms
3. Anaphylaxis refractory to epinephrine, or on patients who have history of serious coronary arterial disease

CONTRAINDICATIONS

1. Patients who will be unable to receive supplemental glucose, orally, IV or rectally after administration of glucagon.
2. Hypersensitivity to pork and/or beef
3. Use with caution on patients with pheochromocytoma.

DRUG INTERACTION

1. Hyperglycemic effects intensified and prolong by epinephrine.
2. Will precipitate when mix with calcium preparation.

ADMINISTRATION

Note: 1 mg = 1 unit

1. Hypoglycemia

Adult: [0.5 - 1 mg] IM, SQ, IVP, may repeat in 10 - 20 minutes if no response.

Pediatric: [0.1 mg/kg] IM, SQ, IVP, may repeat in 10 - 20 minutes if no response.

**THE PATIENT MUST BE GIVEN SUPPLEMENTAL GLUCOSE ASAP;
PO, IV, OR RECTAL.**

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GLUCAGON (cont.)

2. Beta Blocker Overdose

Adult: [3 to 10 mg] IVP over 1 minute. It. may be followed by an infusion of 2 - 5 mg/hr.

Pediatric: [0.1 mg/kg] IVP over 1 minute, repeat in 5 minutes, if needed.

3. Anaphylaxis

Adult: [1 to 2 mg] slow IVP, may be repeated every 5 to 10 minutes.

Pediatric: [0.1 mg/kg up to 1 mg]. Rarely indicated

SPECIAL NOTES

1. The patient must be given supplemental glucose ASAP; PO, IV, or Rectal. If this is not possible, the patient may be better off without glucagon. Glucagon will release all of the patient's available glycogen. If the patient is not provided with glucose, the subsequent hypoglycemia will be greater than before glucagon.
2. Glucagon is supplied in a powder and must be reconstituted by sterile water or saline, 1 ml of normal saline for each 1 mg of powder and shaken well.

GLYCOPROTEIN INHIBITORS

AGGRASTAT -TIROFIBAN®, INTEGRILIN - EPIFIBATIDE®

CLASS OF DRUG

Glycoprotein (GP) IIb/IIIa Inhibitor

INDICATIONS (Authorized for monitoring during inter-facility transport)

1. In combination with heparin, it is indicated for the treatment of acute coronary syndrome, including patients who are to be managed medically and in patients that are undergoing PTCA or atherectomy.

CONTRAINDICATIONS

1. Known hypersensitivity to any component of the product
2. Active internal bleeding or a history of bleeding diathesis within the previous 30 days
3. A history of intracranial hemorrhage, intracranial neoplasm, arteriovenous malformation, or aneurysm
4. A history of thrombocytopenia following prior exposure to a Glycoprotein (GP) IIb/IIIa Inhibitor
5. A history of stroke within 30 days or any history of hemorrhagic stroke
6. Major surgical procedure or severe physical trauma within the previous month
7. History, symptoms, or findings suggestive of aortic dissection
8. Severe hypertension (systolic blood pressure >180 mmHg and/or diastolic blood pressure >110 mmHg)
9. Concomitant use of another parenteral GP IIb IIIa inhibitor
10. Acute pericarditis

DRUG INTERACTION

1. In combination with heparin and aspirin, it has been associated with an increase in bleeding, compared to heparin and aspirin alone.

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GLYCOPROTEIN INHIBITORS (cont.)

ADMINISTRATION

1. Requires an infusion pump
2. AGGRASTAT should be administered intravenously, at an initial rate of [0.4 mg/kg/min] for 30 minutes and then continued at [0.1 mg/kg/min]. For patients with severe renal insufficiency (creatinine clearance <30 ml/min), they should receive half the usual rate of infusion.

SPECIAL NOTES

1. Percutaneous (coronary intervention care of the femoral artery access site) therapy with Glycoprotein (GP) IIb/IIIa Inhibitors is associated with an increase in bleeding rates, particularly at the site of arterial access for femoral sheath placements.
2. Minimize vascular and other trauma. Other arterial and venous punctures, intramuscular injections, and the use of urinary catheters, nasotracheal intubation and nasogastric tubes should be minimized. When obtaining intravenous access, non-compressible sites (e.g., subclavian or jugular veins) should be avoided.

H2 ANTAGONISTS

Cimetidine® Famotidine® Nizatidine® Ranitidine®

CLASS OF DRUG

H2 Antagonist

INDICATIONS - Authorized for Paramedic monitoring during inter-facility transport

1. Treatment of duodenal or gastric ulcers
2. Reduce risk of upper GI bleeding in critically ill patients
3. Uncomplicated GERD

CONTRAINDICATIONS

1. Hypersensitivity

DRUG INTERACTION

2. Dofetilide

ADMINISTRATION

Cimetidine 300 mg IV q. 6-8 hours

Famotidine 20 mg IV q. 12 hours

Nizatidine 75 mg PO q. 12 hours

Ranitidine 50 mg IV q. 6-8 hours

SPECIAL NOTES

1. Confusion and dizziness may occur in elderly patients.
2. Use with caution in patients with renal and hepatic impairment.
3. Blood dyscrasias including thrombocytopenia

HEPARIN

CLASS OF DRUG

Anticoagulant

INDICATIONS (Authorized for monitoring during inter-facility transport)

1. Adjunct to treatment for coronary occlusion
2. Thrombosis in deep vein phlebitis
3. Pulmonary emboli
4. Atrial fibrillation to prevent emboli
5. Low dose to maintain IV patency
6. Disseminated Intra-vascular Coagulation (DIC)

CONTRAINDICATIONS

1. Uncontrolled bleeding, except in DIC.
2. Severe thrombocytopenia
3. Hypersensitivity to heparin, and to pork and/or beef
4. Severe hepatic disease with hypoprothrombinemia

DRUG INTERACTION

1. Increased risk of bleeding when used with aspirin, non-steroidal anti-inflammatory agents, dipyridamole, dextran, quinidine, cefamandole, cefmetazole, cefoperazone, cefotetan, thrombolytics, and warfarin.

ADMINISTRATION: Infusion pump required

Adult: IV: [35-100 u/kg] loading dose; maintenance dose is 14 - 17 u/kg/hr
SQ: [70 u/kg] IV and 140 u/kg SQ; 140 u/kg every 8-12 hours

Pediatric: IV: [50 u/kg]; maintenance dose is 75 u/kg every 8 hrs

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HEPARIN (cont.)

SPECIAL NOTES

1. It must be administered by an infusion pump.
2. Monitor all puncture sites (catheter, incision, etc) for bleeding.
3. Avoid new puncture sites, incisions or injections.
4. Have all dosages double-checked by another Paramedic or RN.
5. **Protamine Sulfate must be carried on long transports with patients receiving heparin.**

HYDROXYCOBALAMINE

CLASS OF DRUG

Antidote

INDICATIONS

1. Treatment of cyanide poisoning

CONTRAINDICATIONS

1. Rare anaphylactic reactions

DRUG INTERACTION

Used in combination with sodium thiosulfates to treat methemoglobinemia. No more effective than sodium nitrite.

ADMINISTRATION

Adult: 5 grams IV over 30 minutes

Pediatrics (<70kg): 70 mg/kg IV

SPECIAL NOTES

1. Transient hypertension
2. Reddish discoloration of skin and mucous membranes

INSULIN

CLASS OF DRUG

Hormone (natural or synthetic)

INDICATIONS (Authorized for monitoring during inter-facility transport)

1. Diabetic ketoacidosis
2. Hyperglycemia
3. Hyperkalemia

CONTRAINDICATIONS

1. Hypersensitivity

DRUG INTERACTION

1. Beta-adrenergic blocker may block signs and symptoms of hypoglycemia.
2. Increase insulin requirements: alcohol, glucocorticoids, and thyroid preparations
3. Decreased insulin requirements: anabolic steroids, tricyclic antidepressants, and MAO inhibitors.

ADMINISTRATION (Requires an infusion pump for IV route.)

1. **Dosages vary dependent on the type of insulin, BGL, physical demands and food intake of the patient.**

Adult:	SQ:	[0.5 u/kg/day] of Regular
	IV:	[0.05 to .1 u/kg] of Regular insulin initially then repeated every 1 hour, dependent on blood glucose level. (Treatment of DKA)
	Infusion:	0.01 - 0.1 u/kg/hr] dependent on BGL

Pediatric: Same as adult. Children however are very sensitive to insulin and careful glucose monitoring should follow. Too rapid of a fall in glucose can cause cerebral edema.

2. **Insulin is sometimes added to TPN, dosage is usually 1- 5 u/liter of Regular insulin, or dosage dependent on blood sugar levels and orders of the transferring physician.**

SPECIAL NOTES

1. It must be monitored by infusion pump.

IPRATROPIUM (ATROVENT®)

CLASS OF DRUG

Anticholinergic

INDICATIONS

1. Bronchial asthma
2. Reversible bronchospasm associated with chronic bronchitis and emphysema.

CONTRAINDICATIONS

1. Hypersensitivity to the drug
2. Acute treatment of bronchospasm where rapid response is required.

DRUG INTERACTION

1. Few in the pre-hospital setting

ADMINISTRATION

1. Should be administered in conjunction with beta agonist therapy.

Adult: [1 – 2 inhalations] via metered dose inhaler
[250 – 500mcg (.25 - .5 mg)] via nebulization

SPECIAL NOTES

1. The vital signs must be monitored during therapy.
2. Caution should be used when administering it to elderly patients and those with cardiovascular disease or hypertension.

LIDOCAINE HYDROCHLORIDE (XYLOCAINE®)

CLASS OF DRUG:

Antidysrhythmic, local anesthetic

INDICATIONS

1. Symptomatic ventricular dysrhythmias
2. Sustained ventricular tachycardia
3. Ventricular fibrillation/pulseless ventricular tachycardia
4. Local anesthetic for nasal intubation

CONTRAINDICATIONS

1. Hypersensitivity
2. High AV Blocks

DRUG INTERACTION

1. Additive cardiac depression with phenytoin, quinidine, procainamide, and propranolol

ADMINISTRATION

1. IV Bolus technique

Adult:

- a. Ventricular tachycardia: [1 -1.5 mg/kg] IV. If VT persists, [0.5-0.75 mg/kg] every 3 to 5 minutes, up to 3.0 mg/kg total. Start lidocaine infusion if VT converts (see below).
- b. Ventricular fibrillation and pulseless VT: [1-1.5 mg/kg] IV or IO (2-2 1/2 times normal dose, ET) followed by defibrillation. If VF or VT persists - repeat [0.5-0.75mg/kg] (up to 3.0 mg/kg total) followed by defibrillation. Start lidocaine infusion if VF converts (see below).

Pediatric: [1 mg/kg] IV or IO

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LIDOCAINE HYDROCHLORIDE (cont.)

2. IV Drip technique

Adult:

- a. Mix 1gm of lidocaine in 250 ml D₅W or NS for a concentration of 4 mg/ml.
 1. If up to 2 mg/kg has been administered Set drip at 2 mg/min
 2. If 2 mg/kg has been administered Set drip at 3 mg/min
 3. If 3 mg/kg has been administered Set drip at 4 mg/min
- b. A second bolus after 10 minutes may be given per physician order.

Pediatric:

- a. Mix 120 mg of lidocaine in 100 ml D₅W
 1. Set drip at 20-50 µg/kg per min. (1-2.5 cc/kg/hr at above dilution)

3. IM: [200mg], if unable to start IV

4. ET 2 - 2 /12 times the bolus dose

SPECIAL NOTES

1. For patients over 70 years of age, or with hepatic or renal failure, the loading dose remains the same, but maintenance infusion is run at half the normal rate.

MAGNESIUM SULFATE

CLASS OF DRUG

CNS depressant; antidysrhythmic; electrolyte

INDICATIONS

1. Initial treatment of seizures associated with eclampsia, and seizures, refractory to benzodiazepines.
2. Second-line antidysrhythmic in the treatment of ventricular fibrillation/pulseless ventricular tachycardia, refractory to lidocaine.
3. First-line antidysrhythmic in the treatment of Torsades de Pointes.
4. To control contractions in pre-term labor
5. Acute asthma refractory to other more conventional treatment, or when the effects of beta-adrenergic medications contraindicate their use.

CONTRAINDICATIONS

1. Hypermagnesemia
2. Hypocalcemia
3. Anuria
4. Heart blocks

DRUG INTERACTION

1. Potentiates neuromuscular blocking agents

ADMINISTRATION

1. Ventricular ectopy refractory to lidocaine: [2 gm] slow IVP
2. Pulseless ventricular fibrillation and ventricular tachycardia refractory to lidocaine and bretylium: [2 gm] IVP followed by defibrillation at 360 to 400 joules
3. Ventricular tachycardia, or wide complex tachycardia, unresponsive to lidocaine: [2 gm] slow IVP

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MAGNESIUM SULFATE (cont.)

4. To control contractions in pre-term labor: [2 gm] slow IVP, followed by maintenance infusion of 1 gm per hour
5. Treatment of seizures associated with eclampsia: [2-4 gm] slow IVP
6. Acute asthma: [1 to 2 gm] slow IVP
7. Acute MI Patient: [1 - 2 gm] (8 - 16 mEq) diluted in 50 or 100 ml D₅W administered over 5 - 60 minutes. An infusion of [0.5 to 1.0 gm (8 - 16 mEq) should follow for 24 hours.
8. Torsades de Pointes: [2 gm] IV push

SPECIAL NOTES

1. Monitor deep tendon reflexes often, especially those patients receiving a maintenance infusion.
2. Calcium gluconate will reverse the toxic effects of magnesium sulfate.

MANNITOL (OSMITROL®)

CLASS OF DRUG

Osmotic diuretic

INDICATIONS (Authorized for monitoring during inter-facility transport)

1. Cerebral edema
2. Increased intra-cranial pressure

CONTRAINDICATIONS

1. Hypersensitivity
2. Anuria
3. Hypovolemia/dehydration
4. Active intra-cranial bleeding
5. Pulmonary edema

DRUG INTERACTION

1. None

ADMINISTRATION

Adult: [1.5 to 2 gm/kg] IV infusion over 20 to 60 minutes

Pediatric: [2 gm/kg] IV infusion over 20 to 60 minutes

SPECIAL NOTES

1. Must have Foley in place
2. Should be run through an in-line filter
3. Incompatible with most other drugs
4. May crystallize at low temperature

NARCOTIC ANALGESICS

HYDROMORPHONE (DILAUDID)

CLASS OF DRUG

Opiate analgesic

INDICATIONS

1. Analgesia for patients with major pain such as burns, and isolated fractures
2. Treatment of acute pulmonary edema
3. Acute myocardial infarction
4. Sedation for procedures

CONTRAINDICATIONS

1. Hypersensitivity
2. Hypotension is a relative contraindication to use. Remember that some people will be hypotensive in response to pain itself. Be cautious.
3. Head or abdominal injuries also contraindicated, since the analgesic effect removes the clinical signs that need to be watched.
4. Do not use in persons with respiratory difficulties because their respiratory drive might be depressed, except in pulmonary edema.
5. In the presence of major blood loss, the body's compensatory mechanisms may be suppressed by the use of morphine, and the hypotensive effect will become very prominent. Do not use it in these circumstances.

DRUG INTERACTION

1. Additive effects with other CNS depressants
2. MAO inhibitors can cause unpredictable and severe reactions, reduce dose to 25% of a usual dose.

ADMINISTRATION

Adult: [0.5-1.0 mg] slow IV push until desired effect achieved.

SPECIAL NOTES

1. Take vital signs before and 2 minutes after administration.
2. IVP only (unless you cannot start an IV and/or are directly ordered to administer IM)
3. Often causes vomiting; administer slowly.
4. On-line medical control should be contact before administering to the non-cardiac patient.

NARCOTIC ANALGESICS (cont.)

FENTANYL (SUBLIMAZE®)

CLASS OF DRUG

Opiate analgesic

INDICATIONS

1. Analgesia for patients with moderate to severe pain
2. Short term sedation.
3. Anesthesia

CONTRAINDICATIONS

1. Hypersensitivity/known intolerance
2. Patients particularly sensitive to respiratory depression
3. Myasthenia gravis
4. Pregnancy

DRUG INTERACTION

1. Benzodiazepines Diazepam - increased risk of CV depression
2. Sedatives/Hypnotics, other opioids, CNS depressants and alcohol - increased risk of hypotension.
3. Avoid use in patients who have received MAO inhibitors within the previous 14 days - may produce unpredictable, potentially fatal reactions.

ADMINISTRATION

Adult: [25-50 mcg] IVP

Pediatric: Under <15 kg (transmucosal only)
2-12 yrs of age – [1 mcg/kg]

SPECIAL NOTES

1. Use cautiously in geriatric or debilitated patient (use lower doses), diabetics, patients with pulmonary or hepatic disease, head trauma, increased ICP, undiagnosed abdominal pain and cardiac disease.
2. Abdominal distension, muscle rigidity, and/or urinary retention may be seen at high doses.

NARCOTIC ANALGESICS (cont.)

MEPERIDINE (DEMEROL®)

CLASS OF DRUG

Opiate analgesic

INDICATIONS

1. Moderate to severe pain
2. Sedation for procedures

CONTRAINDICATIONS

1. Hypersensitivity
2. Recent MAO inhibitor use
3. Use cautiously in:
 - a. Head injury
 - b. Severe hepatic, renal, and pulmonary disease
 - c. Undiagnosed abdominal pain
 - d. Elderly or debilitated patients
 - e. Multi-system trauma patients

DRUG INTERACTION

1. Fatal reactions with MAO inhibitors and procarbazine (seizures)
2. Additive effects with other CNS depressants

ADMINISTRATION

Adult: [25-50 mg] IVP, [50-100 mg] IM

Note: For IV use diluted in NS to 10 mg/ml, give very slow IVP to reduce nausea and vomiting

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NARCOTIC ANALGESICS (cont.)

Pediatric: [0.25 to 0.5 mg/kg] IV; [1 mg/kg] IM

SPECIAL NOTES

1. Nausea and vomiting are the most common side effect, however hypotension and respiratory depression may occur.
2. On-line medical control should be contact before administering to the non-cardiac patient.

NARCOTIC ANALGESICS (cont.)

MORPHINE SULFATE

CLASS OF DRUG

Opiate analgesic

INDICATIONS

1. Analgesia for patients with major pain such as burns, and isolated fractures
2. Treatment of acute pulmonary edema
3. Acute myocardial infarction
4. Sedation for procedures

CONTRAINDICATIONS

1. Hypersensitivity
2. Hypotension is a relative contraindication to use. Remember that some people will be hypotensive in response to pain itself. Be cautious.
3. Head or abdominal injuries also contraindicated, since the analgesic effect removes the clinical signs that need to be watched.
4. Do not use in persons with respiratory difficulties because their respiratory drive might be depressed, except in pulmonary edema.
5. In the presence of major blood loss, the body's compensatory mechanisms may be suppressed by the use of morphine, and the hypotensive effect will become very prominent. Do not use it in these circumstances.

DRUG INTERACTION

1. Additive effects with other CNS depressants
2. MAO inhibitors can cause unpredictable and severe reactions, reduce dose to 25% of a usual dose.

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NARCOTIC ANALGESICS (cont.)

ADMINISTRATION

Adult: [2 - 10 mg] slow IV push until desired effect achieved (Use lowest effective dose to avoid complications)

Pediatric: [0.1 mg/kg] slow IVP titrated to effect with a maximum dose of 15 mg

SPECIAL NOTES

1. Take vital signs before and 2 minutes after administration.
2. IVP only (unless you cannot start an IV and/or are directly ordered to administer IM)
3. Often causes vomiting; administer slowly.
4. On-line medical control should be contact before administering to the non-cardiac patient.

NALOXONE (NARCAN®)

CLASS OF DRUG

Narcotic antagonist

INDICATIONS

1. Reversal of narcotic effects, particularly respiratory depression, due to narcotic drugs, whether ingested, injected, or administered in the course of treatment. Narcotic drugs include agents such as morphine, Demerol®, heroin, Dilaudid®, Percodan®, codeine, Lomotil®, propoxyphene (Darvon®), pentazocine (Talwin®).
2. For unconsciousness of unknown etiology to rule out (or reverse) narcotic depression of CNS.

CONTRAINDICATIONS

1. Hypersensitivity
2. Absences of indication

DRUG INTERACTION

1. May induce narcotic withdrawal

ADMINISTRATION

Adult: [0.4 mg – 2.0 mg] IVP (2.0 mg total dose) - [0.4 – 2.0 mg] if IM, SQ, ET
Titrate to respiratory effort/rate. May be repeated at 2 - 3 minutes, if needed.
[2mg (1mg per naris)] IN

Pediatric: [0.1 mg/kg] < 5 yrs or ≤ 20 kg, [2 mg] ≥ 5 yr or > 20kg IV, ET, IM, SQ, IO,
May be repeated at 0.1 mg/kg if no response.

Neonate: [0.1 mg/kg] slow IVP, ET, IM, SQ, IO; repeat in 2-3 minutes, if needed
(mix 1 ml of naloxone, 0.4 mg in 9 ml of D₅W, which gives 0.04 mg/ml)

Note: Much higher doses should be given to patients with suspected propoxyphene (Darvon®), pentazocine (Talwin®), and fentanyl overdoses.

SPECIAL NOTES

1. The patient may quickly become conscious and combative.

NESIRITIDE (Natreacor®)

CLASS OF DRUG

Vasodilator

INDICATIONS (For administration by IV infusion during patient transfer only)

1. For intravenous treatment of patients with acutely decompensated congestive heart failure.

CONTRAINDICATIONS

1. Should not be used as primary therapy for patient with cardiogenic shock or in patients with a systolic blood pressure ≤ 90 mm hg.

DRUG INTERACTION

ADMINISTRATION

Follow dosing orders of sending physician

SPECIAL NOTES

1. The dose-limiting side effect of Nesiritide is hypotension.

NEUROMUSCULAR BLOCKING AGENTS – NON DEPOLARIZING

CLASS OF DRUG

Non-depolarizing neuromuscular blocking agent

INDICATIONS (For administration during patient transfer only)

1. Facilitation of compliance during mechanical ventilation.

CONTRAINDICATIONS

1. Hypersensitivity to the drug

DRUG INTERACTION

1. Intensity and duration of paralysis may be prolonged by pre-treatment with succinylcholine, lidocaine, quinidine, procainamide, beta-adrenergic blocking agents, potassium-losing diuretics or magnesium

ADMINISTRATION

1. Selected drug, administration, and drug dosage must be determined by Medical Direction prior to transport.

SPECIAL NOTES

1. Patient must be intubated prior to transport.
2. Paralytics do not provide sedation or analgesia.

NON-DEPOLARIZING NEURO MUSCULAR BLOCKING AGENTS		
AGENT	ONSET OF ACTION	DURATION OF ACTION
Short Acting		
Mivacurium (Mivacron)	2-5 min.	15-20 min.
Rapacuronium (Raplon)	35 - 219 sec. (mean 90 sec.)	6 – 30 min. (mean 15 min.)
Rocuronium (Zemeron)	1-3 min.	31 min.
Intermediate Acting		
Atracurium (Tracrium)	2.5 – 5 min.	20 – 45 min.
Cisatracurium (Nimbex)	2 - 3 min.	30 – 40 min
Pancuronium (Pavulon)	2 – 3 min.	60 – 90 min.
Vecuronium (Norcuron)	2 – 3 min.	25 – 40 min.
Long Acting		
Doxacurium (Nuromax)	2.5 – 13 min. (mean 6 min.)	39 – 232 min. (mean 100 min.)
Pipecuronium (Arduan)	2.5 – 5 min.	35 – 175 min. (mean 75 min.)
Tubocurarine	3 -5min.	70-90 min.

NITROGLYCERIN

CLASS OF DRUG

Anti-anginal agent/vascular dilating agent

INDICATIONS

1. Chest pain, anginal pain
2. Congestive heart failure with severe pulmonary edema
3. Hypertensive emergencies (APE, AMI, or encephalopathy)

CONTRAINDICATIONS

1. Hypersensitivity
2. Severe hypotension
3. Pericardial tamponade
4. Increased intra-cranial pressure
5. Hypovolemia/severe anemia

DRUG INTERACTION

1. Additive hypotension with beta-adrenergic blockers, antihypertensives, calcium channel blockers, and phenothiazines.
2. Tricyclic antidepressants and antihistamines may interfere with buccal absorption.
3. Can cause a lethal drop in blood pressure in patients taking Sildenafil citrate (Viagra)

ADMINISTRATION

Adult:

1. Sublingual: [0.3 - 0.4 mg] tablet. Repeat at 3 - 5 minutes as needed to a total of three tabs (or more by MCEP order).
2. Lingual Spray: [0.4 mg] metered dose, sprayed directly under the tongue; additional one or two sprays every 3 - 5 minutes for a total of three sprays.

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NITROGLYCERIN (cont.)

3. Infusion: [5 - 20 mcg/min] the infusion may be increased by 5 mcg/min every 3 - 5 minutes to 50 - 200 mcg/min. The infusion dose is leveled off when desired effect is reached or a decrease in blood pressure of more than 10 mm Hg over baseline or less than 90 mm Hg systolic is observed. (Infusions may be initiated or monitored by Paramedics Only)

Note: The most common method for mixing Nitroglycerin is 50 mg nitroglycerin in 250 ml of normal saline. This yields a concentration of 200 mcg/ml (0.2 mg/ml) in glass or non-absorbable container and non-PVC tubing.

Pediatric: Not recommended for pre-hospital use.

SPECIAL NOTES

1. Common side effects may include: throbbing headache, flushing, dizziness, and burning under the tongue (if these side effects are noted, the pills may be assumed potent, not outdated).
2. Less common effect: marked hypotension, particularly orthostatic.
3. Paramedics should use their supply of nitroglycerin, not the patient's.
4. Use with caution with patient not previously receiving nitroglycerin.
5. Generalized vasodilation may cause profound hypotension and reflex tachycardia.
6. NTG tablets lose potency easily, should be stored in a dark glass container with a tight lid, and not exposed to heat. NTG spray does not have this problem.
7. Use only with Medical Control on patients with systolic BP below 100 mm Hg.

NOREPINEPHRINE (LEVOPHED®)

CLASS OF DRUG

Sympathomimetic

INDICATIONS (Authorized for monitoring during inter-facility transport)

1. Second - line vasopressor for cardiogenic shock during inter-facility transports
2. Forms of shock with low or normal peripheral vascular resistance (e.g., spinal shock, sepsis)

CONTRAINDICATIONS:

1. Hypovolemia (relative)
2. Vascular thrombosis, unless no alternative
3. Hypoxia or hypercapnia

DRUG INTERACTION

1. Cyclopropane or halothane anesthesia, cardiac glycosides, doxapram and cocaine may increase myocardial irritability.
2. MAO inhibitors, methyldopa, doxapram, and tricyclic antidepressant may produce severe hypertension.
3. Alpha-adrenergic blockers may negate effects.
4. Beta-adrenergic blockers may exaggerate hypertension, and block cardiac stimulation.
5. Ergot alkaloids or oxytocin may result in enhanced vasoconstriction.

ADMINISTRATION (Requires an infusion pump).

Adult: IV infusion: [1 to 2 mcg/min] initially, up to 20 mcg/min IV infusion (1 mg in 250 ml D₅W or NS) titrated to blood pressure, may increase [0.5 - 1.0 mcg/min], every 3-5 minutes until desired effect.

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NOREPINEPHRINE (cont.)

Pediatric: [0.1 – 2 mcg/kg/min.]

Note: Concurrent low-dose dopamine infusion (started before transport) is recommended to maintain renal perfusion.

SPECIAL NOTES

1. Use with an infusion pump only.
2. Incompatible with alkaline solutions, aminophylline, barbiturates, phenytoin

NUTRITIONAL SUPPLEMENTS

CLASS OF DRUG

Nutritional Supplement

INDICATIONS (Authorized for monitoring during inter-facility transport)

1. Undernourished patients who cannot ingest large volumes of oral feedings.
2. Patients being prepared for surgery, radiation therapy, or chemotherapy.
3. Patients with disorders requiring complete bowel rest.

CONTRAINDICATIONS

1. Hypersensitivity

DRUG INTERACTION

1. Dependant on the solution being administered.

ADMINISTRATION

1. Most solutions are prepared using sterile techniques. Solutions may be modified based on laboratory results, underlying disorders, hypermetabolism, or other factors.
2. Administration should be based on manufacturer's recommendations and medical control.
3. Route of administration will be dependant on patient condition and needs.
4. Progress should be carefully monitored and documented on a flowchart.

COMPLICATIONS

1. If given IV, complications may be related to the venous catheter (occlusion, infiltration, etc).
2. Bacterial infection is usually due to the increased infection risk from indwelling central venous catheters.
3. Venous thrombosis
4. Priapism

OCTREOTIDE ACETATE (SANDOSTATIN®)

CLASS OF DRUG

Hormone (gastrointestinal)
Antidiarrheal

INDICATIONS (Authorized for monitoring during inter-facility transport)

Treatment of active GI bleeds during transport

CONTRAINDICATIONS

1. Hypersensitivity

DRUG INTERACTION

1. May alter insulin and oral hypoglycemic agent requirements.
2. May interfere with beta-adrenergic blocking agents, calcium channel blockers, and agents to control fluid and electrolyte balance.

ADMINISTRATION

Adults: [100mcg] slow IVP followed by 50mcg/hr infusion.

SPECIAL NOTES

1. Use with caution in diabetics, patients with gallbladder disease, severe renal failure requiring dialysis and during lactation.

OXYGEN

CLASS OF DRUG

Gas

INDICATIONS

1. Suspected hypoxia or respiratory distress from any cause
2. Acute chest pain in which myocardial infarction is suspected
3. Shock (decreased oxygenation of tissue) from any cause
4. Trauma
5. Carbon monoxide poisoning

CONTRAINDICATIONS

1. None

DRUG INTERACTION

1. None

ADMINISTRATION

Adult & Pediatric:

Dosage	Indications
1. Low flow (NC 1 - 2 L/Min)	Patients with chronic lung disease with unusual dyspnea or other problems (see below).
2. Moderate flow (NC 4 - 6 L/Min)	Precautionary use for trauma, chest pain, etc.
3. High flow (NRB 10 - 15 L/Min)	Severe respiratory distress, either medical or traumatic, shock, or at providers discretion

(Continued next page)

OXYGEN (cont.)

SPECIAL NOTES

1. If the patient is not breathing adequately on his own, the treatment of choice is assisted ventilation, not just supplemental O₂.
2. A very small percentage of patients with chronic lung disease lack sensitivity to carbon dioxide levels and breathe only because of their hypoxic drive. Administration of O₂ **MAY** depress their respiratory drive. **DO NOT WITHHOLD OXYGEN IN CRITICALLY ILL PATIENTS BECAUSE OF THIS POSSIBILITY. BE PREPARED TO ASSIST VENTILATION, IF NEEDED.**
3. Oxygen toxicity (overdose) is not a hazard from acute administration.
4. Nasal prongs work equally well on nose and mouth breathers.
5. Giving 100 % oxygen to all patients is unnecessary. If the patient has 96% O₂ saturation and is in no acute distress, a NRB is not necessary.

OXYTOCIN (PITOCIN®)

CLASS OF DRUG

Pituitary hormone - uterine vasoconstrictor

INDICATIONS

1. Control of post-partum hemorrhage, when other methods fail

CONTRAINDICATIONS

1. Potential of a remaining fetus

DRUG INTERACTION

1. Hypertension with vasopressors

ADMINISTRATION

Note: Injectable oxytocin (PITOCIN®) contains 10 USP units (20 mg) per ml

Adult

1. Intravenous dose: [10 - 20 USP units] in 500 ml volume expander (NS or LR). Flow rate of [10 - 15 drops/min] titrated to severity of hemorrhage and uterine response.
2. Intramuscular dose: [10 USP units] (1 ml) IM only if unable to start IV

SPECIAL NOTES

1. None

PHENYLEPHERINE (NEO-SYNEPHRINE®)

CLASS OF DRUG

Alpha-adrenergic agent
Vasoconstrictor (nasal)

INDICATIONS

Used as an agent to reduce bleeding during nasal intubation.

CONTRAINDICATIONS

1. Known hypersensitivity
2. Severe hypertension
3. Ventricular tachycardia

DRUG INTERACTION

1. May decrease effectiveness of insulin, and oral hypoglycemic agents.
2. Use with beta blockers may result in initial hypertension followed by bradycardia.
3. MAO inhibitors - hypertension

ADMINISTRATION

Adults: [2 "squirts"] intranasal, in the selected nostril, prior to insertion of nasal tube.

SPECIAL NOTES

1. Use with extreme caution in geriatric patients, severe arteriosclerosis, bradycardia, partial heart block, pregnancy and lactation.

POTASSIUM

CLASS OF DRUG

Electrolyte

INDICATIONS (Authorized for monitoring during inter-facility transport)

1. IV preparations are used for treatment or prophylaxis of hypokalemia.

CONTRAINDICATIONS

1. Severe renal impairment
2. Hyperkalemia
3. Untreated Addison's disease
4. Severe tissue trauma

DRUG INTERACTION

1. None

ADMINISTRATION

Adult: [10 to 20 mEq/hour] IV drip is standard dose dependent upon patient presentation. Cannot transport a patient receiving concentration of greater than 20 mEq/1000 ml without an infusion pump (**Paramedic Only**)

Pediatric: [2 - 3 mEq/kg/day] IV

SPECIAL NOTES

1. May be monitored during inter-facility transports by EMT-Intermediates:
 - a. No faster than 10 mEq/hour
 - b. Cannot transport concentration of greater than 20 mEq/1000 ml

PRALIDOXIME (2pam)

CLASS OF DRUG

Cholinesterase re-activator

INDICATIONS

1. Organophosphate pesticide or nerve agent poisoning after Atropine has been administered.
2. Unknown cholinesterase inhibitor poisoning

CONTRAINDICATIONS

1. Relative
 - a. Myasthenia gravis
 - b. Renal Failure
2. Absolute
 - a. Inability to perform endotracheal intubation, if neuromuscular blockade were to occur (**a rare, dose and rate related complication**).

DRUG INTERACTION

1. None

ADMINISTRATION

1. Adult
 - a. [600mg] IM by auto injector such as the “Mark I” antidote kit. May be repeated in 3 to 5 minutes after the first dose, if weakness or fasciculations have not been resolved.

SPECIAL NOTES

1. Neuromuscular blockade, laryngospasm, muscular rigidity, and tachycardia have occurred with rapid IV administration, or with doses much higher than those usually administered.
2. Will not work for pesticides of the carbamate class.
3. Morphine, aminophylline, succinylcholine and phenothiazine-type tranquilizers should be avoided in patients with organophosphate poisoning.
4. Must be given concurrent with Atropine.

PROCAINAMIDE HYDROCHLORIDE (PRONESTYL ®)

CLASS OF DRUG

Antidysrhythmic

INDICATIONS (Authorized for monitoring during inter-facility transport)

1. Sustained ventricular tachycardia (with pulse) refractory to lidocaine
2. Premature ventricular contractions refractory to lidocaine
3. Management of ventricular dysrhythmias when lidocaine contraindicated

CONTRAINDICATIONS

1. Pre-existing QT prolongation or torsades de pointes
2. High AV blocks unless a pacemaker is in place.
3. Hypersensitivity

DRUG INTERACTION

1. Additive effect with other antidysrhythmics
2. Antihypertensives may produce hypotension.
3. Additive anticholinergic effects with other anticholinergics.
4. Neurological toxicity with lidocaine

ADMINISTRATION

Adult: [20- 30 mg/min] IVP until:

- a. The dysrhythmia is suppressed
- b. Hypotension ensues
- c. The QRS is widened by 50% of its original width
- d. A total of 17 mg/kg of the medication has been administered

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PROCAINAMIDE HYDROCHLORIDE (cont.)

- e. Infusion [1 gm] in 250 ml D₅W or NS at 1 to 4 mg per minute

Pediatric: Not currently recommended or given in pre-hospital settings.

SPECIAL NOTES

1. May cause severe hypotension, bradycardia and heart blocks
2. Nausea and vomiting are common.
3. Infusion pump recommended.

PROMETHAZINE (PHENERGAN®) and other Anti-Emetic Agents

CLASS OF DRUG

Antiemetic

INDICATIONS

Treatment and prevention of nausea and vomiting.

CONTRAINDICATIONS

1. Hypersensitivity to phenothiazines
2. Comatose patients
3. CNS depression due to drugs
4. Children < 2yrs old, or critically ill or dehydrated.
5. Lactation

DRUG INTERACTION

1. CNS depressants -may increase, prolong or intensify the sedative action.
2. Anticholinergics - use caution
3. MAO inhibitors - use caution

ADMINISTRATION

PROMETHAZINE (PHENERGAN®)

Adults: [12.5-25 mg] PO, IM, IV, or Rectal every 4 hours as needed
Children > 2yrs [0.25-0.5 mg/kg] PO, IM or Rectal every 4 hours as needed
(Use should be limited to prolonged vomiting of known etiology in children)

Other Anti-Emetic Agents

Specific doses for Anti-Emetics other than Promethazine will be determined by Medical Direction.

SPECIAL NOTES

1. Use cautiously in patients with hypertension, epilepsy, sleep apnea, cardiovascular disease, impairment of the liver, and pregnancy.
2. May caused marked drowsiness

PROPOFOL (DIPRIVAN®)

CLASS OF DRUG

Anesthetic

INDICATIONS (For administration by IV infusion during patient transfer only)

1. Maintenance of sedation in intubated, mechanically ventilated patients.

CONTRAINDICATIONS

1. Not recommended in children ≤ 3 years old.
2. Avoid in patients with severe systemic disease.

DRUG INTERACTION

1. Additive CNS and respiratory with alcohol, antihistamines, opiates and sedative/hypnotics.

ADMINISTRATION

Adults: [5-50 mcg/kg/min]. Changes in the rate of infusion should be made slowly (>5minutes) to minimize hypotension.

SPECIAL NOTES

1. Avoid rapid IV bolus in the elderly, debilitated or ASA III/IV patients.
2. May cause hypotension.
3. Patient should be continuously monitored for early signs of hypotension, apnea, airway obstruction, and/or oxygen desaturation.

PROTAMINE SULFATE

CLASS OF DRUG

Antagonist to heparin

INDICATIONS (For administration during inter-facility transport)

1. Excessive heparin treatment

CONTRAINDICATIONS

1. Hypersensitivity to protamine or fish

DRUG INTERACTION

1. None

ADMINISTRATION

1. Contact Medical Control
2. [1 mg] of protamine for every 100 units of heparin remaining in body
Given by IV route only; slowly, not more than 20 mg/min or up to 50 mg in 10 minutes

SPECIAL NOTES

1. Should be available when transporting any patient on heparin drip
2. There is a high incidence of anaphylaxis to this drug

PROTON PUMP INHIBITORS

Esomeprazole (Nexium®) Lansoprazole (Prevacid®) Omeprazole (Prilosec®)

CLASS OF DRUG

Proton pump inhibitor – diminishes daily production of acid

INDICATIONS - Authorized for Paramedic monitoring during inter-facility transport

1. Acid related gastrointestinal disorders
2. Reduce risk of upper GI bleeding in critically ill patients

CONTRAINDICATIONS

1. Hypersensitivity

DRUG INTERACTION

1. Reduced clearance of diazepam
2. Reduced bioavailability of drugs dependant on gastric pH
3. Interacts with warfarin and cyclosporin

ADMINISTRATION

Esomeprazole – Ages 17 and over - 20-40 mg IV q. daily

Lansoprazole – 30 mg IV infusion over 30 minutes

Omeprazole – 20-40 mg PO daily

SPECIAL NOTES

Use with caution in severe liver disease

SODIUM BICARBONATE

CLASS OF DRUG

Alkalinizing agent

INDICATIONS

1. To correct metabolic acidosis found during prolonged cardiac arrest, after initial interventions.
2. May be used as an adjunct in other causes of metabolic acidosis
3. Overdoses of tricyclic antidepressants or phenobarbital.

CONTRAINDICATIONS

1. Suspected metabolic or respiratory alkalosis

DRUG INTERACTION

1. Inactivates most drugs, and must not given in the same IV at same time.
2. Causes calcium preparations to precipitate

ADMINISTRATION

1. Cardiac Arrest

Adult & Pediatric: [1 mEq/kg] IVP initially, then [0.5 mEq/kg] no more than one amp. every 10 minutes until a pulse is restored or as indicated by ABGs.

2. Other special circumstances, such as tricyclic antidepressant overdose

Adult & Pediatric [1 mEq/kg] IVP single dose per physician order

SPECIAL NOTES

1. This agent is no longer a first-line drug for cardiac arrest as per ACLS algorithms.
2. Each amp of bicarbonate contains 44 or 50 mEq of Na⁺⁺. In persons with cardiac disease this will increase intra-vascular volume and further stress the heart.

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SODIUM BICARBONATE (cont.)

3. Hyperosmolarity of the blood can occur because the NaHCO_3 is concentrated. This results in cerebral impairment.
4. These dosages are a very rough guide. Blood gasses should be obtained as soon as possible to direct further therapy.
5. Correct CPR, hyperventilation, defibrillation and drug therapy is more important than bicarbonate.

SODIUM NITROPRUSSIDE (NIPRIDE®)

CLASS OF DRUG

Potent antihypertensive agent; vasodilator

INDICATIONS (Authorized for monitoring during inter-facility transport)

1. Hypertensive emergencies
2. Reduction of cardiac pre-load and after-load
3. It is often used with vasopressor agents to maintain a blood pressure while decreasing the pre-load and after-load.

CONTRAINDICATIONS

1. Hypersensitivity
2. Decreased cerebral perfusion

DRUG INTERACTION

1. Additive effect with other antihypertensives

ADMINISTRATION (Requires an infusion pump).

Adult: Start at [0.5 - 5.0 mcg/kg/min]; titrate slowly to blood pressure up to 10 mcg/kg/min. 2 ml (50 mg) in 250 - 1000 ml of D₅W yielding 50 - 200 mcg/ml.

Pediatric: Same as adult.

SPECIAL NOTES

1. Should only be administered with an infusion pump
2. Solution bag line must be covered in opaque material.
3. Solution is stable for only 24 hours.

TERBUTALINE (BRETHINE®)

CLASS OF DRUG

Bronchodilator, uterine smooth muscle relaxant

INDICATIONS (Authorized for monitoring during inter-facility transport)

1. Asthma
2. Control of pre-term labor

CONTRAINDICATIONS

- 1 Hypersensitivity

DRUG INTERACTION

1. Additive effect with other adrenergic drugs
2. Beta-adrenergic blockers may negate effects.

ADMINISTRATION

1. Pre-term Labor IV: [10 mcg/min] increase every 10 minutes until contractions stop (not to exceed 80 mcg/min) 1 to 2 mg in 250 cc of NS (4 to 8 mcg/ml) via an infusion pump.
2. Asthma

Adult: Metered-Dose Inhaler (MDI): [2 inhalations] every 4 - 6 hours

Small Volume Nebulizer (SVN): [1 - 3 mg] in 3 cc NS

SQ: [0.25 mg] every 15 - 30 minutes up to .5 mg in 4 hours

Pediatric: MDI: Only

SPECIAL NOTES

1. None

THIAMINE

CLASS OF DRUG

Vitamin (B₁)

INDICATIONS

Coma of unknown origin, delirium tremens, chronic alcoholism, signs of malnourishment.

CONTRAINDICATIONS

None in the emergency setting.

DRUG INTERACTION

There are no significant drug interactions with other emergency medications.

ADMINISTRATION

Adult: [100 mg] slow IVP or IM.

Pediatric: [10-25 mg] slow IVP or IM.

SPECIAL NOTES

1. Large IV doses may cause respiratory difficulties.

THROMBOLYTICS (Fibrinolytics)

ALTEPLASE - {tPA}®, STREPTOKINASE, ANISTREPLASE, UROKINASE

CLASS OF DRUG

Thrombolytics/fibrinolytics

INDICATIONS (Authorized for monitoring during inter-facility transport)

1. Myocardial infarction
2. CVA – non-hemorrhagic
3. Pulmonary embolus
4. Femoral occlusion

CONTRAINDICATIONS

1. Hypersensitivity
2. Recent surgery (within 10 days)
3. GI/GU bleeding
4. Uncontrolled hypertension (systolic BP >180, or diastolic BP > 110)
5. Active internal bleeding
6. History of CVA (within 2 months)
7. Recent brain, or spinal surgery (within 2 months)
8. Recent trauma

DRUG INTERACTION

1. Additive effect on bleeding with other anticoagulants, ASA, NSAID.

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THROMBOLYTICS (cont.)

ADMINISTRATION

NOTE: DOSAGES VARY PER PHYSICIAN DIRECTION

Adult

1. **Tissue Plasminogen Activator**
 - a. IV bolus of [10 mg], followed by the following IV drip:
 - i. First hour [50 mg]
 - ii. Second hour [20 mg]
 - iii. Third hour [20 mg]

2. **Streptokinase**
 - a. [1.5 million units] given IV piggy back over a 30 - 60 minute period

SPECIAL NOTES

1. Monitor all puncture sites (e.g., catheters, incisions, etc.) during therapy, and subsequent heparin administration.
2. Avoid new puncture sites or injections.
3. When administering to the patient with AMI, (the most likely to receive this medication), watch the ECG closely for re-perfusion dysrhythmias.
4. Allergic reactions, and even anaphylaxis, can occur when administering this medication.

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THROMBOLYTICS (cont.)

RETEPLASE - RETAVASE®

CLASS OF DRUG

Thrombolytic

INDICATIONS (For re-administration during inter-facility transport)

1. Myocardial Infarction

CONTRAINDICATIONS

1. Hypersensitivity
2. Recent surgery (within 10 days)
3. GI/GU bleeding
4. Uncontrolled hypertension (SBP > 180, or DBP > 110)
5. Active internal bleeding
6. History of CVA (within 2 months)
7. Recent brain, or spinal surgery (within 2 months)
8. Recent trauma

DRUG INTERACTION

1. Additive effect on bleeding with other anticoagulants, ASA, NSAID.

ADMINISTRATION

Adult: 10.8 units IV over 2 min. and repeat in 30 min.

Pediatric: Not recommended

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THROMBOLYTICS (cont.)

SPECIAL NOTES

1. Monitor all puncture sites (e.g., catheters, incisions, etc.) during therapy, and subsequent heparin administration.
2. Avoid new puncture sites or injections.
3. When administering to the patient with AMI, (the most likely to receive this medication), watch the ECG closely for reperfusion dysrhythmias.
4. Allergic reactions, and even anaphylaxis, can occur when administering this medication.

TOPICAL OPHTHALMIC ANESTHETIC (PROPARACAINE - OPTHAINÉ®, ALACAINE ®)

CLASS OF DRUG

Topical/local ophthalmic anesthetic

CONTRAINDICATIONS

1. Ocular pain relief prior to irrigation of the eyes

CONTRAINDICATIONS

1. Hypersensitivity
2. Known or suspected trauma that may have produced intraocular injury.

DRUG INTERACTION

1. None

ADMINISTRATION

1. [1 - 2 drops] of 0.5% solution in each eye. May repeat one time at 15 minutes

SPECIAL NOTES

1. Assess visual acuity as soon as possible.

VACCINES

DPT (DIPHTHERIA, TETANUS (ACELLULAR), PERTUSSIS), TT (TETANUS TOXOID), DT (DIPHTHERIA, TETANUS)

CLASS OF DRUG

Vaccine: Inactivated

INDICATIONS

1. Prevention of diphtheria, tetanus, and pertussis infections (DPT/DTaP)
2. Prevention of tetanus (Tt)
3. Prevention of tetanus and diphtheria (Td)

CONTRAINDICATIONS

1. Children over 7 years of age (DPT only)
2. Previous untoward reaction to DPT or Td. (Relative)
 - a. Fever of 40.5°C (105°F) within 48 hours after previous vaccination
 - b. Collapse with shock-like state within 48 hours of previous vaccination
 - c. Seizure within 3 days of previous vaccination
 - d. Persistent, inconsolable cry lasting > 3 hours within 48 hours of previous vaccination
 - e. Guillain-Barré syndrome (paralytic illness within 6 weeks after vaccination.
3. Immunosuppressed patient
4. Moderate to severe illness
5. Recent receipt of blood products
6. Encephalopathy within 7 days of administration of previous dose of vaccine (DPT)
7. Immediate anaphylactic reaction after previous vaccination

DRUG INTERACTION

1. None

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VACCINES (cont.)

DTP/DTaP

Children at 2 months, 4 months, 6 months, 18 months, 4-6 years

ADMINISTRATION

- | | | |
|----------------------|-----------------------------|--|
| 1. Tt | Children >7
and adults: | [0.5 ml] Td. |
| 2. Tt Booster | Children > 7
and Adults: | Every 10 years, consider giving patients with contaminated wound at 5 years. |
| 3. Dt | Children: | Primary immunization: two[0.5 ml] dose IM at an interval of 4 to 8 weeks
Booster: [0.5 ml] IM every 10 years, or 5 years with contaminated wounds |
| | Adult: | Primary immunization: two 0.5 ml dose IM at an interval of 4 to 8 weeks
Booster: 0.5 ml IM every 10 years, or 5 years with contaminated wounds |

SPECIAL NOTES

1. Advise parents of normal reaction, mild pain and irritability, and low-grade fever controlled with acetaminophen or ibuprofen. For other reactions, return to health care provider.

VACCINES (cont.)

Hepatitis B Vaccine (RECOMBIVAX HB®, ENGERIX-B®)

CLASS OF DRUG

Vaccine: Inactivated viral component

INDICATIONS

1. Prevention of hepatitis B infections

CONTRAINDICATIONS

1. Moderate to severe illness
2. Previous, untoward reaction (Relative)
3. Immunosuppressed patient (Relative)
4. Recent receipt of blood products
5. Severe allergy to components (Baker's yeast)

NOTE: PREGNANCY AND LACTATION SHOULD NOT BE CONSIDERED A CONTRAINDICATION TO VACCINATION

DRUG INTERACTION

1. None

ADMINISTRATION

NOTE: DOSES VARY FOR IMMUNOSUPPRESSED AND DIALYSIS PATIENTS

- | | |
|-------------------------------|---|
| Adults: | [1 ml] IM, use adult formulation if Recombivax HB® is used; followed by a booster at 1 month and 6 months after the first dose. |
| Children Over 11 to 19 years: | [0.5 ml] IM use adult formulation if Recombivax® HB is used, followed boosters at 1 month later, and 6 months after first dose. |

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VACCINES (cont.)

Hepatitis B Vaccine (RECOMBIVAX HB®, ENGERIX-B®)

Children Under 11: [0.5 ml] IM (of pediatric formulation if Recombivax HB® is used), followed by 0.5 ml 1 month later, and third 0.5 ml dose 6 months later.

NOTE: Infants who were born to hepatitis B positive mother need 1 ml of pediatric formulation or 0.5 ml of adult formulation of RECOMBIVAX HB®.

SPECIAL NOTES

1. Booster injections may be necessary

VACCINES (cont.)

Hepatitis A Vaccine (HAVRIX®, VAQTA®)

CLASS OF DRUG

Vaccine: Inactivated

INDICATIONS

1. Prevention of hepatitis A infections, especially in:
 - a. Children **2 years and older** in defined and circumscribe communities with high endemic rates and/or periodic outbreaks of HAV infection
 - b. Patients with chronic liver disease
 - c. Users of injectable and illicit drugs
 - d. Homosexual and bisexual men
 - e. Foreign travel into intermediate or high endemic areas

CONTRAINDICATIONS

1. Moderate to severe illness
2. Previous, untoward reaction (Relative)
3. Immunosuppressed patient (Relative)
4. Recent receipt of blood products
5. Severe allergy to components
6. Children less than 2 years

DRUG INTERACTION

1. None

(Continued next page)

VACCINES (cont.)

Hepatitis A Vaccine (HAVRIX®, VAQTA®)

ADMINISTRATION

1. Havrix®

Adults (over 18): [1 ml (1440 units)] in deltoid muscle, second dosage 1 month after the primary injection. A booster injection 6 - 12 months after the second

2 to 18 years: [0.5 ml (720 units)] IM in deltoid muscle, second dosage 1 month after the primary injection. A booster injection 6 - 12 months after the second

2. VAQTA®

Adults (over 18): [1 ml (50 units)] in deltoid muscle. A booster injection 6 - 12 months after the first

2 to 17 years: [0.5 ml (25 units)] IM in deltoid muscle. A booster injection 6 - 12 months after the first

NOTE: PATIENT SHOULD COMPLETE THE REGIME ON THE SAME

SPECIAL NOTES

1. Advise parents and patient of normal reaction, mild pain and irritability, and low-grade fever controlled with acetaminophen or ibuprofen. For other reactions, return to health care provider.
2. One dose of hepatitis A vaccine includes seroconversion in >95% of the vaccines. The second dose completes the seroconversion rate to 100%.
3. Children and adult vaccines contain different amount of antigens.

VACCINES (cont.)

Influenza Virus Vaccine

CLASS OF DRUG

Vaccine: Inactivated whole virus or split-virus

INDICATIONS

1. Prevention of severe infection from influenza viruses in high risk groups:
 - a. Adults 65 years of age and older
 - b. Adults of any age with chronic cardiovascular or pulmonary disorders, including asthma
 - c. Residents of nursing homes or other facilities for patients with chronic medical conditions
 - d. Adults with chronic metabolic diseases (including diabetes), renal dysfunction, anemia, immunosuppressive or immunodeficiency disorders, which required regular medical follow-up or hospitalization in the past year
 - e. Groups, including household members and care givers, who can transmit influenza to persons at high risk

CONTRAINDICATIONS

1. An allergy to chicken, eggs, or feathers
2. Moderate to severe illness
3. Previous, untoward reaction (Relative)
4. Immunosuppressed patient
5. Recent receipt of blood products
6. Severe allergy to components

DRUG INTERACTION

1. None

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VACCINES (cont.)

Measles, Mumps, Rubella (MMR)

CLASS OF DRUG

Vaccine: Live virus

INDICATIONS

1. Prevention of measles, mumps, rubella in persons 15 months or older

CONTRAINDICATIONS

1. Moderate to severe illness
2. Previous, untoward reaction (Relative)
3. Immunosuppressed patient
4. Recent receipt of blood products
5. Pregnancy
6. Severe allergy to components (eggs, chicken, or previous MMR vaccine)

DRUG INTERACTION

1. MMR vaccination may interfere with the tuberculin skin testing. If testing is indicated and cannot be performed concurrently with MMR vaccination, testing should be postponed for 4-6 weeks.

ADMINISTRATION

Children, 12-15 months: [0.5 ml] SQ

NOTE: SECOND DOSE AT 4-6 YEARS, OR 11-12 YEARS OF AGE.

SPECIAL NOTES

1. Advise parents and patient of normal reaction:
 - a. Rash in 5% of the patients
 - b. Mild pain and irritability
 - c. Low-grade fever controlled with acetaminophen or ibuprofen
 - d. A fever of 39.5° C (103°F) or higher develops in 5-15% of susceptible patients usually beginning 7 - 12 days after MMR vaccination. The fever generally lasts 1-2 days.
 - e. Joint pain and transient arthritis tend to be more frequent in susceptible postpubertal females
 - f. For other reactions, return to health care provider.

VACCINES (cont.)

Poliovirus Vaccine - live, Orimune (OPV) Poliomyelitis Vaccine, Inactivated, IPV, Salk

CLASS OF DRUG

Vaccine: Live OPV, Inactivated IPV

INDICATIONS

1. Prevention of poliomyelitis

CONTRAINDICATIONS

1. Moderate to severe illness
2. Previous, untoward reaction (Relative)
3. Immunosuppressed patient, including HIV and high dose systemic corticosteroid used for longer than 14 days (OPV)
4. Recent receipt of blood products
5. Pregnancy (OPV, refer to supervising PHN or MD)
6. Severe allergy to components (IPV neomycin or streptomycin)
7. Individuals in the house of the patient who are immunodeficient (OPV)

DRUG INTERACTION

1. None

ADMINISTRATION

1. **OPV** [0.5 ml] PO at 2 months; 4 months; 12-18; and 4-6 years
2. **IPV** [0.5 ml] SQ at 2 months; 4 months; 12-18; and 4-6 years
3. **Sequential IPV/OPV** IPV at months, 4 months; OPV at 12-18 months, and 4-6 years

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VACCINES (cont.)**Poliovirus Vaccine - live, Orimune (OPV)****Poliomyelitis Vaccine, Inactivated, IPV, Salk****SPECIAL NOTES**

1. The only well-documented, significant adverse reaction to poliomyelitis vaccination is vaccine-associated paralytic poliomyelitis (VAPP) attributed to OPV. The overall risk of VAPP is 1: 2.4 million doses of OPV distributed.
2. In the following circumstances, immunization with **OPV only** is recommended:
 - a. When parents or providers who prefer not to have the child receive the additional injections
 - b. For infants and children starting the vaccination regimens after 6 months of age
3. Advise parents and patient of normal reaction, mild pain (if IPV) and irritability, and low-grade fever controlled with acetaminophen or ibuprofen. For other reactions, return to health care provider.
4. Un-vaccinated adults should be vaccinated if exposed to children undergoing vaccination. Otherwise unvaccinated adults (18 years and older) need not be vaccinated.
5. In Enhanced-potency polio vaccine (eIPV) is recommended for selected use, primarily unvaccinated adults at increased risk of polio infection, and adults whose immune systems are not functioning normally. In some cases eIPV may be recommended for children living in households where there is someone whose immune system is compromised.

VACCINES (cont.)

Pneumococcal Vaccine (PNEUMOVAX®)

CLASS OF DRUG

Polysaccharide Vaccine

INDICATIONS

1. Children 2 years and older with increased risk of acquiring systemic pneumococcal infection or other serious disease if they become infected. This includes children with the following disease:
 - a. Sickle cell disease
 - b. Functional and anatomic asplenia
 - c. Nephrotic syndrome or chronic renal failure
 - d. Immunosuppression
 - e. HIV infection
 - f. Chronic heart, lung or liver disease
2. Children 2 years and older who live in special environments or social settings which the risk of invasive pneumococcal disease or its complication is very high e.g. certain American Indian populations.

CONTRAINDICATIONS

1. Moderate to severe illness
2. Previous, untoward reaction (Relative)
3. Immunosuppressed patient (Relative)
4. Recent receipt of blood products (Relative)
5. Pregnancy
6. Severe allergy to components

DRUG INTERACTION

1. None

ADMINISTRATION

1. Adults and Children age 2 or older: [0.5 ml] SQ or IM.

SPECIAL NOTES

1. Advise parents and patient of normal reaction, mild pain and irritability, and low-grade fever controlled with acetaminophen or ibuprofen. For other reactions, return to health care provider.

VACCINES (cont.)

Varicella (chicken pox) vaccine

CLASS OF DRUG

Live Virus Vaccine

INDICATIONS

1. All children 12 months through 18 years of age who do not have one of the following:
 - a. A reliable history of clinical chicken pox
 - b. Positive serologic test for immunity
 - c. Documented varicella infection i.e. chicken pox, shingles

CONTRAINDICATIONS

1. Moderate to severe illness
2. Previous, untoward reaction (Relative)
3. Immunosuppressed patient (Including HIV or patients receiving high doses of systemic corticosteroids for 14 days or longer)
4. Recent receipt of blood products, including immunoglobulin administration
5. Pregnancy or breast-feeding mothers
6. Severe allergy to components (Neomycin and gelatin)

DRUG INTERACTION

1. None

ADMINISTRATION

1. Children 1-13 years: [0.5 ml] SQ one dose
2. Children 13 to adults: [0.5 ml] SQ, followed by a booster dose 4-8 weeks later.

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VACCINES (cont.)

Varicella (chicken pox) vaccine

SPECIAL NOTES

1. Advise parents and patient of normal reaction, mild pain and irritability, and low-grade fever controlled with acetaminophen or ibuprofen. For other reactions, return to health care provider.
2. The vaccine may be administered simultaneously with MMR vaccine, but if this not feasible, the interval between administration of varicella and MMR vaccine must be at least one month.
4. Whether Reyes syndrome results from the administration of salicylates after vaccination for varicella in children is unknown. The vaccine's manufacturer, however, recommends that salicylates should not be administered for 6 weeks after varicella vaccination.

VASOPRESSIN (PITRESSIN®)

CLASS OF DRUG

Hormone (antidiuretic)

INDICATIONS

1. May be used as an alternative pressor to epinephrine in the treatment of adult shock-resistant Ventricular Fibrillation.
2. Useful in hemodynamic support in vasodilatory shock (e.g. septic shock)

CONTRAINDICATIONS

1. Chronic renal failure
2. Known hypersensitivity to beef or pork proteins

DRUG INTERACTION

1. Vasopressor effect may be increased by concurrent administration of ganglionic blocking agents.

ADMINISTRATION

Adult: [40 units] IV, IO or ET in a single dose, 1 time only for cardiac arrest.

SPECIAL NOTES

1. Potent vasoconstrictor. Increased peripheral vascular resistance may provoke cardiac ischemia and angina.
2. Not recommended for responsive patients with coronary artery disease.