NEW MEXICO
EMERGENCY MEDICAL SERVICES
GUIDELINES

DRUGS

FIRST RESPONDER
EMT - BASIC
EMT - INTERMEDIATE (AEMT)
EMT - PARAMEDIC

Updated September 20, 2022

TABLE OF CONTENTS

ACETAMINOPHEN (TYLENOL®) 1
ACETYLCYSTEINE (MUCOMYST®, ACETADOTE®) 2
ACETYLSALICYLIC ACID (ASA, ASPIRIN) 3
ACTIVATED CHARCOAL (ACTIDOSE-AQUA®) 4
ADENOSINE (ADENOCARD®) 5
ALBUTEROL (PROVENTIL®, VENTOLIN®, PROAIR®, ACCUNEB®) 6
AMINOPHYLLINE (NORPHYL® PHYLLOCONTIN®, TRUPHYLLINE®) 7
AMIODARONE (CORDARONE®, PACERONE®, NEXTERONE®) 8
ANTIBIOTICS (AND OTHER ANTI-INFECTIVE AGENTS) 9
ANTI-EMETIC AGENTS 11
Promethazine (Phenergan®) *11*
Ondansetron (Zofran®) *12*
ATROPINE SULFATE 13
BETA BLOCKING AGENTS (METOPROLOL, ATENOLOL, LABETALOL) 14
BENZODIAZEPINES 15
Diazepam – (Valium®, Diastat®, AcuDial®) *15*
Midazolam – (Versed®) *16*
Lorazepam – (Ativan®) *17*
BLOOD (PACKED RED CELLS, FRESH PLASMA, WHOLE BLOOD) 18
CALCIUM CHANNEL BLOCKERS 19
Diltiazem HCL (Cardizem ®, Dilacor®, Diltiaz®) *19*
CALCIUM PREPARATIONS 21
CALCIUM GLUCONATE, CALCIUM CHLORIDE *21*
CORTICOSTEROIDS 22
Dexamethasone (Decadron®, Dexasone®) *22*
Methylprednisolone (Solu-Medrol®) *23*
Prednisone *24*
CROTALIDAE POLYVALENT IMMUNE FAB (OVINE) CROFAB 25
DEXTROSE (ORAL/IV/IO – 10%, 25% AND 50%) 26
DIPHENHYDRAMINE HCL (BENADRYL®) 28
DOBUTAMINE (DOBUTREX®) 29
EPINEPHRINE (ADRENALINE®) (1:1,000 AND 1:10,000 SOLUTIONS) 30
EPOPROSTENOL SODUIM (FLOLAN®) 32
FUROSEMIDE (LASIX®) 33
GLUCAGON 34
GLYCOPROTEIN INHIBITORS 36
H2 ANTAGONISTS 38
HEPARIN 39
HYDROXOCOBALAMIN (CYANOKIT®) 40
INSULIN 41
IPRATROPRIUM (ATROVENT®) 42

LEVALBUTEROL (XOPENEX®) 43
LIDOCAINE HYDROCHLORIDE (XYLOCAINE®) 44
MAGNESIUM SULFATE 46
MANNITOL (OSMITROL®) 47
NALOXONE (NARCAN®) 48
NARCOTIC ANALGESICS 49
Hydromorphone (Dilaudid) *49*
Fentanyl (Sublimaze®) *50*
Meperidine (Demerol®) *51*
Morphine Sulfate *52*
NESIRITIDE (NATRECOR®) 53
NEUROMUSCULAR BLOCKING AGENTS – NON DEPOLARIZING 54
NITROGLYCERIN 56
NONSTEROIDAL ANTI-INFLAMMATORY (NSAIDS) 58
Ketorlac (Toradol®) *58*
Ibuprofen (Advil®, Motrin®) *59*
NUTRITIONAL SUPPLEMENTS 60
OCTREOTIDE ACETATE (SANDOSTATIN®) 61
OVER THE COUNTER MEDICATIONS (OTC) 62
OXYGEN 64
OXYTOCIN (PITOCIN®) 65
PHENYLEPHRINE (NEO-SYNEPHRINE®) NASAL SPRAY 66
POTASSIUM 67
PRALIDOXIME (2PAM®) 68
PROCAINAMIDE HYDROCHLORIDE (PRONESTYL®) 69
PROPOFOL (DIPRIVAN®) 70
PROTAMINE SULFATE 71
PROTON PUMP INHIBITORS 72
SODIUM BICARBONATE 73
SODIUM NITROPRUSSIDE (NIPRIDE®) 74
SPECIAL CIRCUMSTANCES 75
TERBUTALINE (BRETHINE®) 76
THIAMINE 77
THROMBOLYTICS (FIBRINOLYTICS) 78
Alteplase - {tPA}®, Streptokinase, Anistreplase, Urokinase *78*
Reteplase - Retavase® *79*
TOPICAL OPHTHALMIC ANESTHETIC 80
TRANEXAMIC ACID (TXA) 81
VACCINES 82
VASOPRESSIN (PITRESSIN®) 83
VASOPRESSOR AGENTS 84
Dopamine Hydrochloride (Dopastat®, Intropin®) *84*
Norepinephrine (Levophed®) *85*

ACETAMINOPHEN (TYLENOL®)

SCOPE OF PRACTICE

EMT-Basic, EMT-Intermediate and EMT-Paramedic

CLASS OF DRUG

Analgesic, Antipyretic

PHARMACOLOGIC ACTION

May work peripherally to block pain impulse generation; may also inhibit prostaglandin synthesis in CNS.

INDICATIONS

1. Fever in pediatric patients
2. Pain management

CONTRAINDICATIONS

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

DRUG INTERACTION

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

ADMINISTRATION

1. Pediatric: [10-15 mg/kg] orally
2. Not to exceed 50 mg/kg/24 hours

SPECIAL NOTES

1. There are multiple over-the-counter medications, as well as scheduled drugs, that include acetaminophen as an active ingredient.

ACETYLCYSTEINE (MUCOMYST®, ACETADOTE®)

SCOPE OF PRACTICE

EMT-Paramedic - Medication for administration during patient transport.

CLASS OF DRUG

Antidotes, Other

PHARMACOLOGIC ACTION

Acts as sulfhydryl group donor to restore liver glutathione; may also scavenge free radicals to prevent delayed hepatotoxicity as antioxidant; encourages sulfation pathway of metabolism for acetaminophen.

INDICATIONS

1. Antidote for acetaminophen overdose

CONTRAINDICATIONS

1. Hypersensitivity
2. Acute Asthma

DRUG INTERACTION

1. None

ADMINISTRATION

1. Follow dosing ordered by sending physician.

SPECIAL NOTES

1. Nausea and vomiting are common adverse effects following the oral administration of acetylcysteine.

ACETYLSALICYLIC ACID (ASA, ASPIRIN)

SCOPE OF PRACTICE

First Responder, EMT-Basic, EMT-Intermediate and EMT-Paramedic

CLASS OF DRUG

Antiplatelet agent, non-steroidal anti-inflammatory drug (NSID)

PHARMACOLOGIC ACTION

Inhibits synthesis of prostaglandin by cyclooxygenase; inhibits platelet aggregation; has antipyretic and analgesic activity.

INDICATIONS

1. For adults with suspected cardiac chest pain, including possible AMI patients.

CONTRAINDICATIONS

1. Hypersensitivity to aspirin or NSAIDs
2. Bleeding disorders
3. Aspirin-intolerant Asthma

ADMINISTRATION

1. Adult: [324 mg] orally for AMI (prefer chewable)
2. Pediatric: Should not to be given to pediatric patients.

SPECIAL NOTES

1. All patients with suspected AMI and without contraindications should receive aspirin.
2. Multiple over-the-counter medications, as well as scheduled drugs, include asprin as an \ active ingredient.

ACTIVATED CHARCOAL (ACTIDOSE-AQUA®)

SCOPE OF PRACTICE

EMT-Basic, EMT-Intermediate and EMT-Paramedic

CLASS OF DRUG

Antidotes, other

PHARMACOLOGIC ACTION

Adsorbs a variety of drugs and chemicals (e.g. physical binding of a molecule to the surface of charcoal particles) desorption of bound particles may occur unless the ration of charcoal to toxin is extremely high.

INDICATIONS

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
3. Unprotected airway (beware of aspiration)

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

1. Adult: [1 gm/kg] PO.
2. Pediatric: Same as adult

SPECIAL NOTES

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

ADENOSINE (ADENOCARD®)

SCOPE OF PRACTICE

EMT-Paramedic

CLASS OF DRUG

Endogenous nucleoside; antidysrhythmic

PHARMACOLOGIC ACTION

Slows conduction through AV node and interrupts AV reentry pathways, which restore normal sinus symptoms.

INDICATIONS

Conversion of regular, narrow complex tachycardia, stable supraventricular tachycardia (SVT) or regular, monomorphic wide complex tachycardia

CONTRAINDICATIONS

1. Hypersensitivity
2. Second or third degree A-V block (except those on pacemakers) and sick sinus syndrome, unless a pacemaker is in place, atrial flutter or fibrillation, ventricular tachycardia.

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

1. Adult [6 mg] rapid IV/IO (1-2 seconds) followed with a 20 cc flush. May be repeated in 1-2 minutes, a second dose of [12 mg] rapid IV/IO followed by a 20 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 20 cc flush.
2. Pediatric: Initial: [0.1 mg/kg (max dose 6 mg)] rapid IV/IO. Repeat in 2-3 minutes if no change at [0.2 mg/kg (max dose 12 mg)] rapid IV/IO.

SPECIAL NOTES

1. Use on patients with asthma, may induce bronchospasms.
2. Safety in pregnancy is unknown.
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.
6. Be aware that ADENOSINE may not be effective in WPW with atrial fibrillation/flutter.

ALBUTEROL (PROVENTIL®, VENTOLIN®, PROAIR®, ACCUNEB®)

SCOPE OF PRACTICE

First Responder, EMT-Basic, EMT-Intermediate and EMT-Paramedic

CLASS OF DRUG

Beta 2 agonist

PHARMACOLOGIC ACTION

Beta 2 receptor agonist with some beta-1 activity; relaxes bronchial smooth muscle with little effect on heart rate.

INDICATIONS

1. Albuterol is used to treat reversible airway obstruction caused by:
    i. Wheezing associated with asthma
    ii. COPD (emphysema)
    iii. Chronic bronchitis

CONTRAINDICATIONS

1. Hypersensitivity
2. Tachycardia secondary to heart condition.

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

1. Adult: [2.5-5.0 mg] (up to 10 mg) in 3 ml of sterile NS given as nebulized inhalation therapy over 5-15 minutes, may be repeated as necessary.
2. Pediatric: [1.25-2.5 mg] (up to 5 mg) in 3 ml of sterile NS given as nebulized 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 (NORPHYL® PHYLLOCONTIN®, TRUPHYLLINE®)

SCOPE OF PRACTICE

EMT-Paramedic - Drug allowed for monitoring in Transport

Requires an infusion pump when given by continuous infusion unless otherwise specified.

CLASS OF DRUG

Xanthine bronchodilator

PHARMACOLOGIC ACTION

Aminophylline causes bronchodilation, diuresis, central nervous system and cardiac stimulation, and gastric acid secretion by blocking phosphodiesterase which increases tissue concentrations of cyclic adenosine monophosphate (cAMP) which in turn promotes catecholamine stimulation of lipolysis, glycogenolysis, and gluconeogenesis, and induces release of epinephrine from adrenal medulla cells.

INDICATIONS

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

1. Adult: [5-7 mg/kg] IV infusion in 50 ml D5W or NS over 20 minutes [0.5 to 0.9 mg/kg per hour] maintenance dose
    i. The lower dose is used for older patients, patients with liver disease, congestive heart failure, hypovolemia, and non-smokers.
    ii. The higher ranges are used for children and smokers.
2. Pediatric:[5-6 mg/kg] IV infusion in 50 ml D5W or NS over 20 minutes not to exceed 12 mg/kg in a 24 hour period

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®, PACERONE®, NEXTERONE®)

SCOPE OF PRACTICE

EMT-Paramedic

CLASS OF DRUG

Antiarrhythmic

PHARMACOLOGIC ACTION

Class III antidysrhythmic agent, which inhibits adrenergic stimulation; affects sodium, potassium, and calcium channels; markedly prolongs action potential and repolarization; decreases AV conduction and sinus node function.

INDICATIONS

1. Management of regular wide complex tachycardia in stable patients
2. Irregular wide complex tachycardia in stable patients
3. Antidysrhythmic for the management of ventricular fibrillation (VF) and pulseless ventricular tachycardia (VT)

CONTRAINDICATIONS

1. Hypersensitivity
2. High degree AV blocks or sinus node dysfunction with marked bradycardia unless a functional pacemaker is in place.
3. Congestive heart failure
4. Cardiogenic Shock

DRUG INTERACTION

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

ADMINISTRATION

1. Adult:
    i. Pulseless VT/VF:[300 mg] initial bolus IV/IO after epinephrine. May re-bolus with [150mg] once.
    ii. 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.
    iii. Maintenance infusion:[1.0 mg/min] over first 6 hours; [0.5 mg/min], 540 mg IV/IO over 18 hours.
2. Pediatric:
    i. Pulseless VT/VF [5mg/kg] IV/IO. May re-bolus every 3-5 minutes to a maximum of 15 mg/kg/24 hours
    ii. Sustained VT [5 mg/kg] IV/IO over 20-60 minutes. May repeat twice, up to 15 mg/kg /24 hours; maximum single dose 150mg.

SPECIAL NOTES

1. Must be drawn up slowly to avoid 'bubbles" do not shake the ampule for the same reason.
2. Cannot be administered via ET tube.

ANTIBIOTICS (AND OTHER ANTI-INFECTIVE AGENTS)

SCOPE OF PRACTICE

[1]EMT-I, EMT-Paramedic - Drug allowed for monitoring in Transport

No infusion pump required.

CLASS OF DRUG

Anti-infective

PHARMACOLOGIC ACTION

Antibiotics or antibacterials are a type of antimicrobial used in the treatment and prevention of bacterial infection. They may either kill or inhibit the growth of bacteria. Several antibiotics are also effective against fungi and protozoans, and some are toxic to humans and animals, even when given in therapeutic dosage. Antibiotics are not effective against viruses such as the common cold or influenza, and may be harmful when taken inappropriately.

INDICATIONS

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

1. **Aminoglycosides**: Gram negative bacteria, bone and joint, soft tissue, Post-op, UTIs, and intra-abdominal infections.
2. **Cephalosporin**: Gram positive cocci and limited use against gram negative (E. coli).
3. **Chloramphenicol**: NOT TO BE USED IN TRIVIAL INFECTIONS. Serious infection caused by Salmonella, Rickettsia, and Chlamydia. Meningitis caused by hemophilus influenza, and Meningococcal meningitis.
4. **Erythromycin (EES) and Macrolides**: Bacteriostatic against Streptococcus sp., Staphylococcus aureus, Mycoplasma pneumoniae, Hemophilus influenza (when used with sulfonamides), and many others.
5. **Penicillin:** Bactericidal against Gram negative bacteria such as Hemophilus influenza, Escherichia coli, Proteus mirabilis, Neisseria gonorrhea; Gram positive organisms such as Streptococcus.
6. **Polymyxin**: Has potent bactericidal activity against many gram negatives such as Pseudomonas, Proteus, and Hemophilus.
7. **Sulfonamide**: Wide bacteriostatic spectrum against gram positives and gram negatives.
8. **Anti-fungal**: Wide fungicidal activity against Candida, Trichophyton, Epidermophyton, and Microsporum.
9. **Fluoroquinolones**: Broad spectrum of activity against gram positive and gram negative bacteria including pseudomonas (Ciprofloxacin=Cipro®)
10. **Tetracycline:Rickettsia, Chlamydia, and Mycoplasma**. Use to treat syphilis and gonorrhea for patients who are allergic to PCN.

CONTRAINDICATIONS

1. General: Contraindicated if any history of hypersensitivity to the particular class of antibiotics. Must use another class
2. Aminoglycosides: Can cause renal or hearing impairment.
3. Cephalosporin: Use with caution with renal and hepatic impaired patients.
4. Chloramphenicol: Pregnancy and nursing mothers.

(Continued next page)

ANTIBIOTICS and other anti-infective agents (cont.)

5. Erythromycin (EES) and Macrolides: In patients taking Seldane® and other antihistamine(s) may lead to Torsades de Pointes.
6. Penicillin: Use with caution on patients with hay fever or other allergies.
7. Polymyxin: Use in pregnancy if benefits outweigh risks.
8. Sulfonamide: Third trimester pregnancy, nursing mothers, and infants under two months.
9. Anti-Fungal: None when indicated.
10. Fluoroquinolones: Children and nursing mothers.
11. Antitubercular: In Isoniazid use - Liver disease or a history of alcoholism or injection drug use is an important concern.

ADMINISTRATION

Refer to manufacture's information

SPECIAL NOTES

1. [1] Antibiotics and other anti-infectives utilizing an infusion pump; intermediate EMT's may monitor antibiotic or other anti-infective agents, provided a hospital initiated infusion has been running for a minimum of 30 minutes prior to the intermediate initiating the transfer, and the intermediate EMT is aware of reactions for which to monitor and the appropriate action to take before assuming responsibility for patient care.

ANTI-EMETIC AGENTS

Promethazine (Phenergan®)

SCOPE OF PRACTICE

EMT-Intermediate, EMT-Paramedic

CLASS OF DRUG

Antiemetic

PHARMACOLOGIC ACTION

Mechanism not fully characterized; selective 5-HT3 receptor antagonist; binds to 5-HT3 receptors both in periphery and in CNS, with primary effects in GI tract. Has no effect on dopamine receptors and therefore does not cause extrapyramidal symptoms

INDICATIONS

1. 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

1. Adult: [12.5-25 mg] PO,IV/IO, IM

SPECIAL NOTES

1. This is a second-line choice for the treatment of nausea and vomiting. Consider using Zofran as a first-line drug.
2. Use caution in geriatric or debilitated patients; consider using lower doses.
3. Use cautiously in patients with hypertension, epilepsy, sleep apnea, cardiovascular disease, impairment of the liver, and pregnancy.
4. Be prepared to treat dystonic reactions (as presenting with muscle spasms) with Diphenhydramine (Benadryl).
5. May caused marked drowsiness
6. Do not use in patients with known Long QT Syndrome

(Continued next page)

ANTI-EMETIC AGENTS (cont)

Ondansetron (Zofran®)

SCOPE OF PRACTICE

EMT-Intermediate, EMT-Paramedic

CLASS OF DRUG

Anti-emetic

PHARMACOLOGIC ACTION

Mechanism not fully characterized; selective 5-HT3 receptor antagonist; binds to 5-HT3 receptors both in periphery and in CNS, with primary effects in GI tract. Has no effect on dopamine receptors and therefore does not cause extrapyramidal symptoms

INDICATIONS

Treatment and prevention of nausea and vomiting.

CONTRAINDICATIONS

1. Known hypersensitivity to Ondansetron or related agents.

DRUG INTERACTION

1. Co-administration with apomorphine; combination reported to cause profound hypotension and loss of consciousness

ADMINISTRATION

1. Adult [4mg] IV/IO/PO/IM. May repeat in 30 minutes.

   *[8mg] Oral Dissolving Tablets (ODT). Place ODT in patient's mouth and instruct the patient to allow it to dissolve. The tablet dissolves in seconds and any residue may then be swallowed.
2. Pediatric: [0.05-0.1 mg/kg] IV/IO/PO/IM (Max dose 4mg)

   *[4mg] ODT (12-17 years of age)

*** Note**: Providers may not administer a second dose of Zofran. ODT, or exceed the adult or pediatric doses listed above. Lower dosing in the elderly is not necessary

SPECIAL NOTES

1. Reduce dosages (2-4mg) IV/IO or IM for elderly or debilitated patients, e.g. hepatic dysfunction or know prolonged QT syndrome.

WARNING: May cause dose-dependent QT prolongation, avoid in patients with congenital long QT syndrome

ATROPINE SULFATE

SCOPE OF PRACTICE

[1]First Responder, [1]EMT-Basic, [1]EMT-Intermediate and EMT-Paramedic

CLASS OF DRUG

Anticholinergic, toxicity antidote

PHARMACOLOGIC ACTION

Competitively inhibits action of acetylcholinesterase on autonomic effectors innervated by postganglionic nerves.

INDICATIONS

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

CONTRAINDICATIONS

1. No absolute contraindications for ACLS, documented hypersensitivity in non-ACLS/nerve agent/organophosphate scenarios

DRUG INTERACTION

Antihistamines, tricyclic antidepressants - additive affect

ADMINISTRATION

1. Cardiac Indications:
    i. Adult:[0.5mg] IV/IO, every 3-5 minutes: Max dose 3 mg. (0.04 mg/kg) for bradycardia.
    ii. Pediatric:[0.02 mg/kg] IV/IO for 1 dose. Minimum of 0.1 mg and maximum of 0.5 mg. [0.03 mg/kg] ET.
2. Anticholinesterase poisoning:
    i. Adult: [2.0 mg] IV, ET, or IO repeated until symptoms abate
    ii. Pediatric:[0.05 mg/kg] IV, ET, or IO, repeated until symptoms abate
3. Mushroom Poisoning:
    i. Adult: [2 mg] IV, repeated to doses sufficient enough to control parasympathomimetic signs

SPECIAL NOTES

1. Available evidence suggests that the routine use of Atropine during asystole is unlikely to have a therapeutic benefit. Atropine is no longer recommended for use in asystole or PEA.
2. May be not be effective with high degree A-V block (2nd degree type II, 3rd degree) - do not delay pacing.
3. 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.
4. Atropine increases the workload and myocardial 02 consumption of heart. Beware of patients who have an ischemic myocardium. Administer supplemental oxygen.
5. Ineffective in hypothermic bradycardia
6. [1]IM injection for treatment of chemical and/or nerve agent exposure, via auto injector only

BETA BLOCKING AGENTS (METOPROLOL, ATENOLOL, LABETALOL)

SCOPE OF PRACTICE

EMT-Paramedic - Drug allowed for monitoring in Transport.

Requires an infusion pump when given by continuous infusion.

CLASS OF DRUG

Beta-adrenergic blocker

PHARMACOLOGIC ACTION

Blocks response to beta-adrenergic stimulation; cardio selective for beta-1 receptors at low doses, with little or no effect on beta-2 receptors

INDICATIONS

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®, Diastat®, AcuDial®)

SCOPE OF PRACTICE

EMT-Paramedic

CLASS OF DRUG

Benzodiazepine, anticonvulsants, skeletal muscle relaxants, anxiolytic

PHARMACOLOGIC ACTION

Modulates postsynaptic effects of GABA-A transmission, resulting in an increase in presynaptic inhibition. Appears to act on part of the limbic system, as well as on the thalamus and hypothalamus, to induce a calming effect

INDICATIONS

1. Control of seizures
2. Reduction of anxiety in agitated or violent patients

CONTRAINDICATIONS

1. Hypersensitivity
2. Severe respiratory depression

DRUG INTERACTION

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

ADMINISTRATION

1. Adults
    i. [2-10 mg] IV/IO/IM, slow with IV running open
2. Pediatric:
    i. [0.05 – 0.1 mg/kg] IV/IO

    Note: Apnea in children after diazepam administration may occur

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 in patients who have taken other depressant drugs, especially alcohol and barbiturates.
3. It can cause local venous irritation. Use relatively large veins.
4. 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.

WARNING: May cause respiratory depression, arrest, or apnea

BENZODIAZEPINES (cont.)

Midazolam – (Versed®)

SCOPE OF PRACTICE

EMT-Paramedic

CLASS OF DRUG

Anticonvulsants, other; antianxiety agent; anxiolytics; benzodiazepines

PHARMACOLOGIC ACTION

Binds receptors at several sites within the CNS, including the limbic system and reticular formation; effects may be mediated through gabba-aminobutyric acid (GABA) receptor system; increase in neuronal membrane permeability to chloride ions enhances the inhibitory effects of GABA; the shift in chloride ions causes hyperpolarization (less excitability) and stabilization of the neuronal membrane

INDICATIONS

1. Control of seizures
2. Uncontrolled shivering in hypothermia
3. Reduction of anxiety in agitated or violent patients suffering behavioral emergencies

CONTRAINDICATIONS

1. Hypersensitivity
2. Severe respiratory depression
3. Sleep apnea

ADMINISTRATION

1. Adult:
    i. [5-10 mg] IN/IM. Max single dose is 10mg. May repeat once after 10 minutes
    ii. [2 to 5 mg] SIVP/IO. Repeat every 5 minutes as needed up to 10mg.

Pediatric:

i. [0.2 mg/kg] IN/IM. Max single dose is 5mg. May repeat once after 10 min.
ii. [0.1 mg/kg] SIVP/IO. Repeat every 5 minutes as needed, up to 10mg.

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 in patients who have taken other depressant drugs, especially alcohol and barbiturates.
3. It can cause local venous irritation. Use relatively large veins.
4. Versed 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.

WARNING: May cause respiratory depression, arrest, or apnea

BENZODIAZEPINES (cont.)

Lorazepam – (Ativan®)

SCOPE OF PRACTICE

EMT-Paramedic

CLASS OF DRUG

Anticonvulsants, other; antianxiety agent; anxiolytics; benzodiazepines

PHARMACOLOGIC ACTION

Sedative hypnotic with short onset of effects and relatively long half-life; by increasing the action of gamma-aminobutyric acid (GABA), which is a major inhibitory neurotransmitter in the brain, lorazepam may depress all levels of the CNS, including limbic and reticular formation

INDICATIONS

1. Control of seizures
2. Uncontrolled shivering in hypothermia
3. Reduction of anxiety in agitated or violent patients suffering behavioral emergencies

CONTRAINDICATIONS

1. Hypersensitivity
2. Severe respiratory depression
3. Acute narrow angle glaucoma
4. Sleep apnea

ADMINISTRATION

1. Adults
    i. [2 - 4 mg] (0.05 mg/kg) IV/IO, slow with IV running open
2. Pediatric:
    i. [0.05-0.1 mg/kg to a maximum 4 mg]. Onset 2-3 minutes. Duration 12-24 hours.

Note: Higher doses may be required

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 in patients who have taken other depressant drugs, especially alcohol and barbiturates.
3. It can cause local venous irritation. Use relatively large veins.
4. Versed 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.

WARNING: May cause respiratory depression, arrest, or apnea

BLOOD (PACKED RED CELLS, FRESH PLASMA, WHOLE BLOOD)

SCOPE OF PRACTICE

EMT-Paramedic

No pump required.

CLASS OF DRUG

Naturally occurring colloid

PHARMACOLOGIC ACTION

RBCs are used to restore oxygen-carrying capacity to the blood of a patient that is suffering from an anemia due to trauma or other (perhaps chronic) medical problems, and are by far the most common blood component used in transfusion medicine.

Plasma serves as the protein reserve of the human body. It plays a vital role in an intravascular osmotic effect that keeps electrolytes in balanced form and protects the body from infection and other blood disorders.[

Whole blood, if available, may be indicated for large volume hemorrhaging, such as seen with major trauma, requiring massive transfusion and rapid correction of anemia, coagulopathy, acidosis, and hypothermia.

INDICATIONS

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.

CALCIUM CHANNEL BLOCKERS

Diltiazem HCL (Cardizem ®, Dilacor®, Diltiaz®)

SCOPE OF PRACTICE

EMT-Paramedic - Drug allowed for monitoring in Transport

Requires an infusion pump when given by continuous infusion.

CLASS OF DRUG

Calcium Channel Blocker; Coronary Vasodilator, Antidysrhythmic Type IV

PHARMACOLOGIC ACTION

Inhibits extracellular calcium ion influx across membranes of myocardial cells and vascular smooth muscle cells, resulting in inhibition of cardiac and vascular smooth muscle contraction and thereby dilating main coronary and systemic arteries; no effect on serum calcium concentrations; substantial inhibitory effects on cardiac conduction system, acting principally at AV node, with some effects at sinus node.

INDICATIONS

1. For management of narrow complex tachycardias

CONTRAINDICATIONS

1. Documented hypersensitivity
2. Wolff-Parkinson-White syndrome
3. Lown-Ganong-Levine syndrome
4. Symptomatic severe hypotension (systolic BP < 90 mm Hg),
5. Sick sinus syndrome (if no pacemaker)
6. Second and third degree heart block (if no pacemaker present), and complete heart block.
7. Contraindications for IV administration
    i. Use in newborns (because of benzyl alcohol)
    ii. concomitant beta-blocker therapy
    iii. cardiogenic shock
    iv. ventricular tachycardia (must determine whether origin is supraventricular or ventricular)

DRUG INTERACTION

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

ADMINISTRATION

1. Adult:
    1. [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.

        Note: A reasonable dose for the average patient is 25 mg

(Continued next page)

DILTIAZEM HCL (cont.)

2. 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.
3. Pediatric: Not usually used.

SPECIAL NOTES

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

CALCIUM PREPARATIONS

CALCIUM GLUCONATE, CALCIUM CHLORIDE

SCOPE OF PRACTICE

EMT-Paramedic

CLASS OF DRUG

Antidotes, other; calcium salts

PHARMACOLOGIC ACTION

Bone mineral component; cofactor in enzymatic reactions, essential for neurotransmission, muscle contraction, and many signal transduction pathways

INDICATIONS

1. Used as antidote for calcium channel blocker overdoses
2. Topical Burns (hydrofluoric acid)
3. Magnesium sulfate overdoses

CONTRAINDICATIONS

1. Hypercalcemia
2. Documented hypersensitivity
3. Life-threatening cardiac arrhythmias may occur in known or suspected severe hypokalemia

DRUG INTERACTION

1. Increase toxicity of cardiac glycoside
2. Calcium should be given in a dedicated IV line
3. DO NOT mix with Sodium Bicarbonate

ADMINISTRATION

1. Calcium Gluconate
    i. Adult: [5 - 10 ml] SLOW IVP (Do Not Exceed 2 ml/minute) repeat if necessary after 5 - 10 min.
    ii. Pediatric: [0.6 ml/kg] SLOW IVP of 10% solution
2. Calcium Chloride:
    i. Adult:[5-10ml] by SLOW IVP. Repeat every 10 minutes as needed (1 ml of 10% = 100 mg of calcium chloride).
    ii. 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.**

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 significant tissue necrosis at injection site

CORTICOSTEROIDS

Dexamethasone (Decadron®, Dexasone®)

SCOPE OF PRACTICE

EMT-Paramedic

CLASS OF DRUG

Anti-Inflammatory; immunosuppressant

PHARMACOLOGIC ACTION

Potent glucocorticoid with minimal to no mineralocorticoid activity. Decreases inflammation by suppressing migration of polymorphonuclear leukocytes (PMNs) and reducing capillary permeability; stabilizes cell and lysosomal membranes, increases surfactant synthesis, increases serum vitamin A concentration, and inhibits prostaglandin and proinflammatory cytokines; suppresses lymphocyte proliferation through direct cytolysis, inhibits mitosis, breaks down granulocyte aggregates, and improves pulmonary microcirculation

INDICATIONS

1. Brain injury associated with trauma – CONTACT MEDICAL CONTROL
2. Reactive airway disease with no response to Albuterol and other treatments
3. Patients suffering from high altitude cerebral edema (HACE)

CONTRAINDICATIONS

1. Documented hypersensitivity
2. Systemic fungal infection, cerebral malaria

DRUG INTERACTION

1. None

ADMINISTRATION

1. Adults – [10 mg] IV/IO/IM
2. Pediatrics – [0.6 mg/kg] (range 0.15-1.0 mg/kg) IV/IO/IM (Max dose of 10mg)

SPECIAL NOTES

1. Compatible in D5W/NS

CORTICOSTEROIDS (cont)

Methylprednisolone (Solu-Medrol®)

Medrol®, Medrol Dosepak®, DepoMedrol®

SCOPE OF PRACTICE

[1]EMT-Intermediate and EMT-Paramedic

[1] For reactive airway disease/acute asthma exacerbation

CLASS OF DRUG

Corticosteroid, Anti-Inflammatory; immunosuppressant

PHARMACOLOGIC ACTION

Potent glucocorticoid with minimal to no mineralocorticoid activity. Modulates carbohydrate, protein, and lipid metabolism and maintenance of fluid and electrolyte homeostasis. Controls or prevents inflammation by controlling rate of protein synthesis, suppressing migration of polymorphonuclear leukocytes (PMNs) and fibroblasts, reversing capillary permeability, and stabilizing lysosomes at cellular level

INDICATIONS

1. Reactive airway disease with no response to Albuterol and other treatments
2. Allergic reactions

CONTRAINDICATIONS

1. Hypersensitivity
2. Immunocompromised state; serious infections; psychotic disorders

DRUG INTERACTION

None

ADMINISTRATION

1. Adults – [125mg] IV/IO (Max dose 125mg)
2. Pediatrics – [1-2mg/kg] IV/IO (Max dose 125mg)

SPECIAL NOTES

1. Adverse effects – hyperglycemia; psychosis
2. High dose methylprednisolone is no longer given routinely for spinal cord injury but may occasionally be ordered by a neurosurgeon.

CORTICOSTEROIDS (cont)

Prednisone

SCOPE OF PRACTICE

EMT-Paramedic

CLASS OF DRUG

Synthetic corticosteroid

PHARMACOLOGIC ACTION

Prednisolone irreversibly binds with glucocorticoid receptors (GR) alpha and beta for which they have a high affinity. AlphaGR and BetaGR are found in virtually all tissues with variable numbers between 3000 and 10000 per cell, depending on the tissue involved. Prednisolone can activate and influence biochemical behaviour of most cells. The steroid/receptor complexes dimerise and interact with cellular DNA in the nucleus, binding to steroid-response elements and modifying gene transcription. They induce synthesis of some proteins, and inhibit synthesis of others

INDICATIONS

1. Exacerbated asthma

CONTRAINDICATIONS

1. 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. Phenytion, phenobarbital and rifampin may decrease effectiveness.

ADMINISTRATION

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

SPECIAL NOTES

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

CROTALIDAE POLYVALENT IMMUNE FAB (OVINE) CROFAB

SCOPE OF PRACTICE

EMT-Paramedic - Drug allowed for monitoring in Transport

CLASS OF DRUG

Antivenin

PHARMACOLOGIC ACTION

CroFab® is a venom-specific Fab fragment of immunoglobulin G (IgG) that works by binding and neutralizing venom toxins, facilitating their redistribution away from target tissues and their elimination from the body.

INDICATIONS

1. To manage patients with minimal or moderate North American cortalid (eg, rattlesnakes, copperheads, cottonmouths/water moccasins) envenomation.

CONTRAINDICATIONS

1. History of papaya or papain allergy

DRUG INTERACTION

1. There are several drugs with known moderate drug interactions. Medical control should be consulted for transport concerns.

ADMINISTRATION

1. CroFab may be monitored during inter-facility transport provided the physician initiated CroFab infusion has been running for a minimum of 30 minutes prior to the paramedic initiating the transfer and assuming responsibility for patient care.

SPECIAL NOTES

1. Risk of anaphylactic reaction (esp. if allergic to sheep protein). Monitor for sign/symptoms of allergic reaction; discontinue if it occurs. Have epinephrine, antihistamine and/or albuterol available.

DEXTROSE (ORAL/IV/IO – 10%, 25% AND 50%)

SCOPE OF PRACTICE

[1]First Responder, [1]EMT-Basic, EMT-Intermediate and EMT-Paramedic

[1] Oral Glucose Preparations only

CLASS OF DRUG

Glucose-elevating agents; metabolic and endocrine, other

PHARMACOLOGIC ACTION

Parenteral dextrose is oxidized to carbon dioxide and water, and provides 3.4 kilocalories/gram of d-glucose

INDICATIONS

1. Symptomatic hypoglycemia
2. Unconsciousness with suspected hypoglycemia
3. Seizures (associated with decreased BGL) of:
    i. Unknown etiology
    ii. New onset of seizures
    iii. Known diabetic actively seizing

CONTRAINDICATIONS

1. Hyperglycemia
2. Diabetic coma
3. Intra-cranial or intraspinal hemorrhage
4. Anuria
5. Dehydrated patients with delirium tremens
6. Unconscious (for oral dextrose)

DRUG INTERACTION

1. None

ADMINISTRATION

1. Oral:[12-25 gm] of paste, may be spread with a tongue depressor
2. IV:
    i. Adult: [12.5 to 25 gm] slow IV/IO push into patent line, 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)
    ii. 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)
    iii. Neonates: Use a 10% Dextrose solution (dilute 50ml D50 in 500ml bag of D5W) at [0.2 gm/kg].

(Continued next page)

DEXTROSE (cont.)

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
3. Do not administer through the same infusion set as blood.

DIPHENHYDRAMINE HCL (BENADRYL®)

SCOPE OF PRACTICE

EMT-Intermediate and EMT-Paramedic

CLASS OF DRUG

Antihistamine, H1 blocker

PHARMACOLOGIC ACTION

Histamine H1-receptor antagonist of effector cells in respiratory tract, blood vessels, and GI smooth muscle

INDICATIONS

1. Allergic reactions
2. Anaphylaxis
3. Dystonic reaction to phenothiazines

CONTRAINDICATIONS

1. Documented hypersensitivity
2. Use controversial in lower respiratory tract disease (such as acute asthma), premature infants and neonates

DRUG INTERACTION

1. Additive CNS depression with alcohol, sedatives, narcotics

ADMINISTRATION

1. Adults:[25-50 mg], slow IV/IO at a rate of 1ml/min or deep IM injection
2. Pediatric: [1 mg/kg], slow IV/IO; 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®)

SCOPE OF PRACTICE

EMT-Paramedic - Drug allowed for monitoring in Transport.

Requires an infusion pump when given by continuous infusion.

CLASS OF DRUG

Sympathomimetic, beta agonist

PHARMACOLOGIC ACTION

Dobutamine directly stimulates beta-1 receptors of the heart to increase myocardial contractility and stroke volume, resulting in increased cardiac output.

INDICATIONS

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

1. 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)
2. 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.

EPINEPHRINE (ADRENALINE®) (1:1,000 AND 1:10,000 SOLUTIONS)

EpiPen®, TwinJect®, Adrenaclick®, Auvi-Q, Adrenalin®, AsthmaNefrin®, Vaponefrin®

SCOPE OF PRACTICE

[1]First Responder, [1]EMT-Basic, EMT-Intermediate and EMT-Paramedic

[1]1:1000, no single dose greater than 0.3 ml, subcutaneous or intramuscular injection with a pre-measured syringe (including autoinjector) or 0.3 ml TB syringe for anaphylaxis or status asthmaticus refractory to other treatments.

CLASS OF DRUG

Sympathomimetic, Alpha/beta adrenergic agonist

PHARMACOLOGIC ACTION

Strong alpha-adrenergic effects, which cause an increase in cardiac output and heart rate, a decrease in renal perfusion and peripheral vascular resistance, and a variable effect on BP, resulting in systemic vasoconstriction and increased vascular permeability. Strong beta-1- and moderate beta-2-adrenergic effects, resulting in bronchial smooth muscle relaxation

Secondary relaxation effect on smooth muscle of stomach, intestine, uterus, and urinary bladder

INDICATIONS

1. Severe Bronchospasm
2. In the nebulized form for croup/bronchiolitis and IM form for refractory acute asthma
3. Anaphylaxis
4. Cardiac Arrest
5. Symptomatic bradycardia refractory to other treatments
6. Shock

CONTRAINDICATIONS

1. Hypersensitivity
2. Cardiac dilatation
3. Coronary insufficiency

DRUG INTERACTION

1. Reduced effects with Beta-adrenergic blocker

(Continued next page)

EPINEPHRINE (cont.)

ADMINISTRATION

1. Cardiac Arrest
    i. Adult: [1 mg](1:10,000) every 3 - 5 minutes IV/IO preferred, may be given ET (2 - 2 1/2 times IV dose)
    ii. Pediatric: IV/IO 0.01 mg/kg (1:10,000) every 3-5 minutes. ET 0.1 mg/kg (1:1000)
2. Bradycardia
    i. Adult: [1 mg/ 1:1,000] in 250 cc NS or D5W administered at 2 - 10 mcg/min
    ii. Pediatric: [0.01 mg/kg] IV/IO every 3-5 minutes or; [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
3. Bronchospasm/Anaphylaxis
    i. Adult: [0.3 mg] (1:1,000) IM using a 0.3 ml syringe or pre-filled device.
    ii. Adult: [0.1 mg] (1:10,000) IV/IO over 5 minutes. Infusion of [1-4 mcg/min] (**Paramedic only**).
    iii. Pediatric: [0.01 mg/kg (1:1000)], IM to a maximum dose of 0.3 mg/dose
4. Croup
    i. Pediatric: Epi 1:1000 5ml (equivalent to 0.5ml 2.25% racemic epi) nebulized.

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. Consider pulmonary edema or pulmonary embolus in wheezing patients with a history of RAD.
4. EMT-Intermediates and Paramedics are not required to use a pre-filled device or 0.3 cc syringes.

EPOPROSTENOL SODUIM (FLOLAN®)

SCOPE OF PRACTICE

EMT-Paramedic - Administration of the patient's own medication.

CLASS OF DRUG

Prostaglandin (vasodilator)

PHARMACOLOGIC ACTION

1. Epoprostenol has 2 major pharmacological actions:
    1. Direct vasodilation of pulmonary and systemic arterial vascular beds
    2. Inhibition of platelet aggregation.

INDICATIONS

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®)

SCOPE OF PRACTICE

EMT-Paramedic

CLASS OF DRUG

Potent loop diuretic

PHARMACOLOGIC ACTION

Furosemide, like other loop diuretics, acts by inhibiting NKCC2, the luminal Na-K-2Cl symporter in the thick ascending limb of the loop of Henle. The action on the distal tubules is independent of any inhibitory effect on carbonic anhydrase or aldosterone; it also abolishes the corticomedullary osmotic gradient and blocks negative, as well as positive, free water clearance.

Additionally, furosemide is a noncompetitive subtype-specific blocker of GABA-A receptors.[9][10][11] Furosemide has been reported to reversibly antagonize GABA-evoked currents of α6β2γ2 receptors at μM concentrations, but not α1β2γ2 receptors.[9][11] During development, the α6β2γ2 receptor increases in expression in cerebellar granule neurons, corresponding to increased sensitivity to furosemide.

INDICATIONS

1. Hypertensive emergencies (AMI, APE, or encephalopathy)

CONTRAINDICATIONS

1. Hypovolemia
2. Hypokalemia
3. Hypotension

DRUG INTERACTION

1. Severe hypotension with antihypertensives and nitrates

ADMINISTRATION

1. Adult:For patients not currently taking furosemide, [20 - 40 mg] slow IVP or [0.5 - 1.0 mg/kg] slow IV/IO. If the patient is currently taking furosemide, double their current dose and administer IV/IO. You may repeat one dose in 2 hours.
2. Pediatric: [1.0 mg/kg] slow IVP. It may be repeated in 6 - 8 hours.

SPECIAL NOTES

1. There is controversy regarding the use of Lasix in acute pulmonary edema in the prehospital setting, and use is not recommended by the NASEMSO Medical Directors Council at this time. Since pulmonary edema is more commonly a problem of volume distribution than overload, administration of furosemide provides no immediate benefit for most patients.

GLUCAGON

GlucaGen®, Glucagon Emergency Kit®, GlucaGen HypoKit®

SCOPE OF PRACTICE

EMT-Intermediate, EMT-Paramedic

CLASS OF DRUG

Hypoglycemia antidotes, glucose-elevating agents, other antidotes (e.g. beta-blocker or calcium channel blocker overdose)

PHARMACOLOGIC ACTION

Insulin antagonist. Stimulates cAMP synthesis to accelerate hepatic glycogenolysis and gluconeogenesis. Glucagon also relaxes smooth muscles of GI tract

INDICATIONS

1. For the management of hypoglycemic patients
2. Beta blocker overdose with serious signs and symptoms (Paramedic Only)
3. Calcium channel blocker overdose with serious signs and symptoms (Paramedic Only)
4. Anaphylaxis refractory to epinephrine, or in patients who have history of serious coronary arterial disease and cannot receive epinephrine. (Paramedic Only)

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
    i. Adult: [0.5 - 1 mg] IM, may repeat in 10 - 20 minutes if no response
    ii. Pediatric: [0.1 mg/kg] IM may repeat in 10 - 20 minutes if no response.

(Continued next page)

GLUCAGON (cont.)

2. Beta Blocker Overdose
    i. Adult: [3 to 10 mg] IV/IO over 1 minute. It. may be followed by an infusion of 2 - 5 mg/hr.
    ii. Pediatric:[0.1 mg/kg] IV/IO over 1 minute, repeat in 5 minutes, if needed.
3. Anaphylaxis
    i. Adult: [1 to 2 mg] slow IV/IO, may be repeated every 5 to 10 minutes.
    ii. Pediatric: [0.1 mg/kg up to 1 mg]. IV/IO, may be repeated every 5 to 10 minutes. 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 with sterile water or saline, 1 ml of normal saline for each 1 mg of powder and shaken well.

GLYCOPROTEIN INHIBITORS

AGGRASTAT -TIROFIBAN®, INTEGRILIN - EPIFIBATIDE®

SCOPE OF PRACTICE

EMT-Paramedic - Drug allowed for monitoring in Transport.

Requires an infusion pump when given by continuous infusion.

CLASS OF DRUG

Glycoprotein (GP) IIb/IIIa Inhibitor

PHARMACOLOGIC ACTION

Bind to glycoprotein IIb/IIIa receptor on platelet surface and prevent binding of adhesive glycoproteins (particularly fibrinogen) to activated platelets

INDICATIONS

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.

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.

(Continued next page)

GLYCOPROTEIN INHIBITORS (Cont)

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®

SCOPE OF PRACTICE

EMT-Paramedic - Drug allowed for monitoring in Transport.

Requires an infusion pump when given by continuous infusion.

CLASS OF DRUG

Histamine H2 Antagonist

PHARMACOLOGIC ACTION

Blocks H2-receptors of gastric parietal cells, leading to inhibition of gastric secretions.

INDICATIONS

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

CONTRAINDICATIONS

1. Hypersensitivity to H2 receptor antagonists.

DRUG INTERACTION

1. Dofetilide

ADMINISTRATION

1. Cimetidine300 mg IV q. 6-8 hours
2. Famotidine20 mg IV q. 12 hours
3. Nazatidine75 mg PO q. 12 hours
4. Ranitidine50 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

SCOPE OF PRACTICE

EMT-Paramedic - Drug allowed for monitoring in Transport.

Requires an infusion pump when given by continuous infusion.

CLASS OF DRUG

Anticoagulant

PHARMACOLOGIC ACTION

Heparin binds to the enzyme inhibitor antithrombin III (AT), causing a conformational change that results in its activation through an increase in the flexibility of its reactive site loop.[15] The activated AT then inactivates thrombin and other proteases involved in blood clotting, most notably factor Xa. The rate of inactivation of these proteases by AT can increase by up to 1000-fold due to the binding of heparin.

INDICATIONS

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:

1. Infusion pump required
2. Follow physician’s orders for transport

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.

HYDROXOCOBALAMIN (CYANOKIT®)

SCOPE OF PRACTICE

EMT-Intermediate and EMT-Paramedic

CLASS OF DRUG

Cyanide Antidote

PHARMACOLOGIC ACTION

Vitamin B12 with hydroxyl group complexed to cobalt which can be displaced by cyanide resulting in cyanocobalamin that is renally excreted

INDICATIONS

Treatment of cyanide poisoning

CONTRAINDICATIONS

1. Documented hypersensitivity - Rare anaphylactic reactions

WARNING: Will cause discoloration of the skin and urine, can interfere with pulse oximetry. Due to its interference with certain diagnostic blood tests, the performance of prehospital phlebotomy is preferable prior to the administration of hydroxocobalamin

DRUG INTERACTION

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

ADMINISTRATION

1. Adult: [5 grams] IV/IO over 30 minutes
2. Pediatrics (<70kg): [70 mg/kg] IV/IO

SPECIAL NOTES

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

INSULIN

SCOPE OF PRACTICE

EMT-Paramedic - Drug allowed for monitoring in Transport.

Requires an infusion pump when given by continuous infusion

CLASS OF DRUG

Hormone (natural or synthetic)

PHARMACOLOGIC ACTION

Insulin is a peptide hormone produced by beta cells in the pancreas. It regulates the metabolism of carbohydrates and fats by promoting the absorption of glucose from the blood to skeletal muscles and fat tissue and by causing fat to be stored rather than used for energy. Insulin also inhibits the production of glucose by the liver.

INDICATIONS

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

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

   FOLLOW PHYSICIAN'S ORDERS FOR TRANSPORT.
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.

IPRATROPRIUM (ATROVENT®)

SCOPE OF PRACTICE

EMT-Basic, EMT-Intermediate and EMT-Paramedic

CLASS OF DRUG

Anticholinergic, respiratory

PHARMACOLOGIC ACTION

Anticholinergic (parasympatholytic) agent; inhibits vagally mediated reflexes by antagonizing acetylcholine action; prevents increase in intracellular calcium concentration that is caused by interaction of acetylcholine with muscarinic receptors on bronchial smooth muscle.

INDICATIONS

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

CONTRAINDICATIONS

1. Hypersensitivity to the drug, especially with Atropine products, soy and peanuts

DRUG INTERACTION

1. Oxivent and Spiriva

ADMINISTRATION

1. Should be administered in conjunction with beta agonist therapy.
    i. Adult:[1 – 2 inhalations] via metered dose inhaler
    [250 – 500mcg] (.25 - .5 mg)] via nebulization
    ii. Not recommended for pediatrics

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.

LEVALBUTEROL (XOPENEX®)

SCOPE OF PRACTICE

First Responder, EMT-Basic, EMT-Intermediate and EMT-Paramedic

CLASS OF DRUG

Isomer, Beta 2 Agonist

PHARMACOLOGIC ACTION

Xopenex (levalbuterol HCl) inhalation solution binds to human beta-adrenergic receptors on the smooth muscles of all airways. This relaxes the airways, which protects against bronchoconstrictor challenges.

INDICATIONS

1. Xopenex is used to treat reversible airway obstruction caused by:
    i. Wheezing associated with asthma
    ii. COPD (emphysema)
    iii. Chronic bronchitis

CONTRAINDICATIONS

1. Hypersensitivity to the drug class.
2. MAO inhibitor use w/in 14 days.
3. Hypersensitivity to peanuts.

DRUG INTERACTION

1. Phenothiazines

ADMINISTRATION

1. Nebulizer
    i. Adult:[1.25 mg] in 3 ml of sterile NS given as inhalation therapy over 5-15 minutes, may be repeated as necessary.
    ii. Pediatric: [0.63-1.25 mg] in 3 ml of sterile NS given as inhalation therapy over 5-15 minutes, may be repeated as necessary.

SPECIAL NOTES

1. Drug of choice for patients that you are concerned with having an increased myocardial oxygen demand. However this drug can still cause an increase in Heart Rate and BP.
2. It is not recommended that this drug be mixed with Atrovent.

LIDOCAINE HYDROCHLORIDE (XYLOCAINE®)

SCOPE OF PRACTICE

[1]EMT-Intermediate, EMT-Paramedic

[1]Lidocaine (2%, preservative and epinephrine free for IV use) for administration into the intraosseous space on pain responsive patients prior to receiving intraosseous fluids or medications.

CLASS OF DRUG:

Antidysrhythmic, local anesthetic

PHARMACOLOGIC ACTION

Class IIb antidysrhythmic; combines with fast sodium channels and thereby inhibits recovery after repolarization, resulting in decreasing myocardial excitability and conduction velocity

INDICATIONS

1. Stable monomorphic Ventricular Tachycardia
2. Refractory or recurrent Ventricular fibrillation/pulseless ventricular tachycardia
3. Local anesthetic for nasal intubation
4. Local anesthetic for IO cannulation

CONTRAINDICATIONS

1. Hypersensitivity
2. SA/AV/intraventricular heart block in the absence of artificial pacemaker
3. Adams-Stokes syndrome.
4. CHF
5. Cardiogenic shock
6. Second and third degree heart block (if no pacemaker is present)
7. Wolff-Parkinson-White Syndrome

DRUG INTERACTION

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

ADMINISTRATION

1. IV/IO Bolus technique
    1. Adult:
        i. Ventricular tachycardia: [1 -1.5 mg/kg] IV/IO. 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).
        ii. Ventricular fibrillation and pulseless VT: [1-1.5 mg/kg] IV/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).

(Continued next page)

LIDOCAINE HYDROCHLORIDE (cont.)

Pediatric: [1 mg/kg] IV/IO

2. IV Drip technique
    1. Adult:
        i. Mix 1gm of lidocaine in 250 ml D5W or NS for a concentration of 4 mg/ml.
            a).If up to 2 mg/kg has been administeredSet drip at 2 mg/min
            b).If 2 mg/kg has been administeredSet drip at 3 mg/min
            c).If 3 mg/kg has been administeredSet drip at 4 mg/min
        ii. A second bolus after 10 minutes may be given per physician order.
        Pediatric:
        i. Mix 120 mg of lidocaine in 100 ml D5W
            a).Set drip at 20-50 µg/kg per min. (1-2.5 cc/kg/hr at above dilution)
3. ET2 - 2 /12 times the bolus dose
4. IO Anesthetic
        i. 40 mg infused over 2 minutes. Allow to remain in place for 60 seconds. Connect tubing to IO and begin infusion.
        ii.Pediatric - 0.5 mg / kg not to exceed 40 mg over 2 minutes.
        iii.May repeat at ½ initial dose PRN.

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

SCOPE OF PRACTICE

EMT-Paramedic

CLASS OF DRUG

CNS depressant; Class V antidysrhythmic; electrolyte; smooth muscle relaxant

PHARMACOLOGIC ACTION

Depresses CNS, blocks peripheral neuromuscular transmission, produces anticonvulsant effects; decreases amount of acetylcholine released at end-plate by motor nerve impulse. Slows rate of sino-atrial (SA) node impulse formation in myocardium and prolongs conduction time. Promotes movement of calcium, potassium, and sodium in and out of cells and stabilizes excitable membranes

INDICATIONS

1. Initial treatment of seizures associated with eclampsia, and seizures, refractory to benzodiazepines.
2. First-line antidysrhythmic in the treatment of Torsades de Pointes.
3. 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
5. Diabetic Coma
6. Myocardial damage

DRUG INTERACTION

1. Potentiates neuromuscular blocking agents

ADMINISTRATION

1. Treatment of pre-eclampsia and/or seizures associated with eclampsia: [2 - 4 gm] slow IVP or IO followed by maintenance infusion of 1- 2 gm per hour
2. Torsades de Pointes: [1 - 2 gm] diluted in 10ml of D5W IV/IO push
3. Acute asthma: [1 - 2 gm] slow IVP or IO, or IV/IO infusion over 10 minutes

SPECIAL NOTES

1. Monitor deep tendon reflexes often, especially those patients receiving a maintenance infusion.
2. Calcium gluconate should be used to reverse the toxic effects of magnesium sulfate.
3. Monitor for hypotension.

MANNITOL (OSMITROL®)

SCOPE OF PRACTICE

EMT-Paramedic - Drug allowed for monitoring in Transport.

Requires an infusion pump when given by continuous infusion.

CLASS OF DRUG

Osmotic diuretic

PHARMACOLOGIC ACTION

Mannitol elevates blood plasma osmolality, resulting in enhanced flow of water from tissues, including the brain and cerebrospinal fluid, into interstitial fluid and plasma. Induces diuresis because mannitol is not reabsorbed in the renal tubule, thereby increasing the osmolality of the glomerular filtrate, facilitating excretion of water, and inhibiting the renal tubular reabsorption of sodium, chloride, and other solutes .

INDICATIONS

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

None

ADMINISTRATION

1. Follow Physician’s orders

SPECIAL NOTES

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

NALOXONE (NARCAN®)

SCOPE OF PRACTICE

[1]First Responder, EMT-Basic, EMT-Intermediate and EMT-Paramedic

[1]Via nasal mucosal atomizer, or [IM delivery system (if patient's own medication)]

CLASS OF DRUG

Opioid reversal agent

PHARMACOLOGIC ACTION

Competitive opioid antagonist; synthetic congener of oxymorphone

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®).

CONTRAINDICATIONS

1. Hypersensitivity
2. Absences of indication

DRUG INTERACTION

1. Administration of naloxone can result in the sudden onset of opiate withdrawal (agitation, tachycardia, pulmonary edema, nausea, vomiting, and, in neonates, seizures)

ADMINISTRATION

1. Adult: [2mg (1mg per naris)] IN, [0.4 mg – 2.0 mg] IV/IO (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.
2. 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.
3. 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.

NARCOTIC ANALGESICS

Hydromorphone (Dilaudid)

SCOPE OF PRACTICE

EMT-Intermediate and EMT-Paramedic

CLASS OF DRUG

Opiate analgesic

PHARMACOLOGIC ACTION

Narcotic agonist-analgesic of opiate receptors; inhibits ascending pain pathways, thus altering response to pain; increases pain threshold; produces analgesia, respiratory depression, and sedation

INDICATIONS

1. Analgesia for patients with moderate to severe pain
2. Treatment of acute pulmonary edema (Paramedic only)
3. Sedation for procedures (Paramedic only)

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

1. Adult:[0.5-1.0 mg] slow IV/IO push until desired effect achieved.
2. Pediatrics: not recommended

SPECIAL NOTES

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

NARCOTIC ANALGESICS (cont.)

Fentanyl (Sublimaze®)

SCOPE OF PRACTICE

EMT-Intermediate and EMT-Paramedic

CLASS OF DRUG

Synthetic opioid, Opiate analgesic

PHARMACOLOGIC ACTION

Narcotic agonist-analgesic of opiate receptors; inhibits ascending pain pathways, thus altering response to pain; increases pain threshold; produces analgesia, respiratory depression, and sedation

INDICATIONS

1. Analgesia for patients with moderate to severe pain

CONTRAINDICATIONS

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

WARNING: Should be used with caution in the elderly and in patients with hypotension, suspected gastrointestinal obstruction, head injury, and concomitant CNS depressants

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

1. Adult: [25-100 mcg] slow IV/IO every 5 minutes to effect. (Maximum single dose of 100mcg and maximum total dose of 300mcg without approval from medical control). Do not give if systolic BP is less than 100.
2. Pediatric: (2-12 yrs. of age) [0.5 - 1 mcg/kg] IV/IO to a maximum of 2.0 mcg/kg slow IV push over 2 minutes.

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®)

SCOPE OF PRACTICE

EMT-Paramedic

CLASS OF DRUG

Opiate analgesic

PHARMACOLOGIC ACTION

Acts as agonist at specific opioid receptors in the CNS to produce analgesia, euphoria, sedation; the receptors mediating these effects are thought to be the same as those mediating the effects of endogenous opioids (enkephalins, endorphins).

INDICATIONS

1. Moderate to severe pain
2. Sedation for procedures

CONTRAINDICATIONS

1. Hypersensitivity
2. Recent MAO inhibitor use
3. Use cautiously in:
    i. Head injury
    ii. Severe hepatic, renal, and pulmonary disease
    iii. Undiagnosed abdominal pain
    iv. Elderly or debilitated patients
    v. e.Multi-system trauma patients

DRUG INTERACTION

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

ADMINISTRATION

1. Adult:[25-50 mg] IV/IO, [50-100 mg] IM
2. PediatricNot recommended

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

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 contacted before administering to the non-cardiac patient.

NARCOTIC ANALGESICS (cont.)

Morphine Sulfate

MS Contin®, Avinza®, Depodur®, Duramorph®, Infumorph®, Astramorph®, Kadian®, MSO4

SCOPE OF PRACTICE

EMT-Intermediate and EMT-Paramedic

CLASS OF DRUG

Opiate analgesic

PHARMACOLOGIC ACTION

Narcotic agonist-analgesic of opiate receptors; inhibits ascending pain pathways, thus altering response to pain; produces analgesia, respiratory depression, and sedation; suppresses cough by acting centrally in medulla

INDICATIONS

1. Analgesia for patients with moderate to severe pain
2. Treatment of acute pulmonary edema (Paramedic only)
3. Sedation for procedures (Paramedic only)

CONTRAINDICATIONS

1. Hypersensitivity
2. Hypotension
3. Respiratory depression, acute or severe bronchial asthma, upper airway obstruction
4. 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.
5. Heart failure due to chronic lung disease
6. Deliriums tremens, seizure disorders
7. During labor when premature birth anticipated

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

1. Adult: [4-10 mg] slow IV/IO titrating 2-4 mg every 10 minutes to effect. (Max of 10 mg without approval from medical control) Do not administer if the systolic BP is less than 100.
2. Pediatric:(2-12 yrs of age) [0.05 - 0.1 mg/kg] slow IV/IO titrated to effect

SPECIAL NOTES

1. Take vital signs before and 2 minutes after administration.
2. IV/IO only (unless you cannot start an IV/IO 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.

NESIRITIDE (NATRECOR®)

SCOPE OF PRACTICE

EMT-Paramedic - Drug allowed for monitoring in Transport.

Requires an infusion pump when given by continuous infusion.

CLASS OF DRUG

Vasodilator (human B-type natriuretic peptide)

PHARMACOLOGIC ACTION

Human BNP binds to the particulate guanylate cyclase receptor of vascular smooth muscle and endothelial cells, leading to increased intracellular concentrations of guanosine 3'5'-cyclic monophosphate (cGMP) and smooth muscle cell relaxation. Cyclic GMP serves as a second messenger to dilate veins and arteries. Nesiritide has been shown to relax isolated human arterial and venous tissue preparations that were precontracted with either endothelin-1 or the alpha-adrenergic agonist, phenylephrine.

INDICATIONS (For administration by IV/IO 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

1. Increase in symptomatic hypotension in patients receiving oral ACE inhibitors

ADMINISTRATION

1. Follow dosing orders of sending physician

SPECIAL NOTES

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

NEUROMUSCULAR BLOCKING AGENTS – NON DEPOLARIZING

SCOPE OF PRACTICE

[1]EMT-Paramedic - Medication for administration during patient transport.

[1] In patients that are intubated prior to transport

CLASS OF DRUG

Non-depolarizing neuromuscular blocking agent

PHARMACOLOGIC ACTION

A decrease in binding of acetylcholine leads to a decrease in its effect and neuron transmission to the muscle is less likely to occur. It is generally accepted that non-depolarizing agents block by acting as reversible competitive inhibitors. That is, they bind to the receptor as antagonists and that leaves fewer receptors available for acetylcholine to bind.

INDICATIONS

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 transferring MD prior to transport.

SPECIAL NOTES

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

(See chart next page)

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

Nitrostat®, Nitrolingual Pumpspray®, NitroQuick®

SCOPE OF PRACTICE

[1]EMT-Basic, [2]EMT-Intermediate and EMT-Paramedic

[1]Patients own medication with on line medical control only.

[2] Must have intravenous access established prior to administration or approval of online medical control if IV/IO access is unavailable.

CLASS OF DRUG

Nitrates, anti-anginal agent/vascular dilating agent

PHARMACOLOGIC ACTION

Organic nitrate which causes systemic venodilation, decreasing preload. Cellular mechanism: nitrate enters vascular smooth muscle and converted to nitric oxide (NO) leading to activation of cyclic guanosine monophosphate (cGMP) and vasodilation. Relaxes smooth muscle via dose-dependent dilation of arterial and venous beds to reduce both preload and afterload, and myocardial O2 demand. Also improves coronary collateral circulation. Lower BP, increases heart rate, occasional paradoxical bradycardia.

INDICATIONS

1. Chest pain, anginal pain
2. Congestive heart failure with severe pulmonary edema

CONTRAINDICATIONS

1. Hypersensitivity
2. ~~H~~ypotension (SBP < 100 mm Hg or ≥30 mm Hg below baseline)
3. Increased intra-cranial pressure
4. Severe anemia
5. Extreme bradycardia (< 50 bpm)
6. Tachycardia in the absence of heart failure (> 120 bpm)
7. Confirmed right ventricular infarction

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) within 24 hours of ingestion, tadalafil (Cialis®) within last 48 hours, vardenafil (Levitra®) within last 48 hours, or other phopsphodiesterase-5 inhibitors.

ADMINISTRATION

1. Adult:
    i. 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).
    ii. 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 (or more by MCEP order).

(Continued next page)

NITROGLYCERIN (cont.)

iii. 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.

2. 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 loose 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.

NONSTEROIDAL ANTI-INFLAMMATORY (NSAIDS)

Ketorlac (Toradol®)

SCOPE OF PRACTICE

EMT- Intermediate, EMT-Paramedic

CLASS OF DRUG

Non steroidal anti-infammatory

PHARMACOLOGIC ACTION

Ketorlac works by reducing hormones that cause inflammation and pain in the body. It is not a narcotic and is not habit-forming. It is 30 times the strength of asprin. It will not cause physical or mental dependence, as narcotics can. However, ketorolac is sometimes used together with a narcotic to provide better pain relief than either medicine used alone.

INDICATIONS

1. For the acute management of moderately severe pain for children > 1 year and adults.

CONTRAINDICATIONS

1. Allergy to aspirin, ketorolac, or other NSAIDS
2. Asthma (relative)
3. Women who are in active labor or are breastfeeding
4. Significant renal impairment particularly when associated with volume depletion
5. Previous or current GI bleeding, intracranial bleeding, coagulation defects, patients with a high risk of bleeding

DRUG INTERACTION

1. Coumadin
2. Plavix
3. ASA
4. Other NSAIDs or anticoagulants

ADMINISTRATION

1. Adult: [10-30mg] IV [30-60mg] IM
2. Pediatric: > 1yr. [0.5 mg/kg] IM/IV

SPECIAL NOTES:

1. This medication is best reserved for patients with a history concerning for kidney stones and should not be used in anyone who has suspected bleeding (for example – trauma, abdominal aortic aneurysm rupture, gastrointestinal bleeding). This medication should not be used in patients with known or suspected kidney dysfunction.
2. Consult MCEP if patient has a history of any liver disease, kidney disease, blood disorders, ulcers, heart disease, alcohol use, high blood pressure, eye disease, asthma, nasal polyps, any allergies - especially aspirin/NSAID allergy (e.g., ibuprofen, celecoxib).

(Continued next page)

NONSTEROIDAL ANTI-INFLAMMATORY (NSAIDS) (Cont.)

Ibuprofen (Advil®, Motrin®)

SCOPE OF PRACTICE

[1]EMT-Basic, [2]EMT-Intermediate and EMT-Paramedic

[1] ibuprofen PO in pediatric or adults to treat fever or pain

[2]ibuprofen PO to pediatrics and adults for pain or fever; IV or IM

CLASS OF DRUG

Non-steroidal anti-inflammatory drug (NSAID)

PHARMACOLOGIC ACTION

Inhibits synthesis of prostaglandins in body tissues

INDICATIONS

For the acute management of pain or as an antipyretic for children>6months and adults.

CONTRAINDICATIONS

1. Allergy to aspirin, ketorolac, or other NSAIDS
2. Perioperative pain in setting of coronary artery bypass graft (CABG) surgery
3. Preterm infants with untreated proven or suspected infection
4. Bleeding with active intracranial hemorrhage or GI bleed
5. Thrombocytopenia
6. Coagulation defects
7. Proven or necrotizing enterocolitis
8. Significant renal impairment

DRUG INTERACTION

1. Coumadin
2. Plavix
3. ASA
4. Other NSAIDs or anticoagulants

ADMINISTRATION

1. Adult: [10mg/kg] up to 800mg PO [400-800mg] IV over 30 minutes
2. Pediatrics: [10mg/kg] PO, not to exceed 800 mg. Dosing must be six (6) hours apart. [10mg/kg] IV over 30 minutes

SPECIAL NOTES:

1. Febrile seizures occur in normal children between 6months and 6 years. Such seizures are usually short, lasting less than 5 minutes, generalized, and usually do not require anti-seizure drug therapy.
2. Oncology patients should not receive Ibuprofen or other NSAIDS due to the risk of increased bleeding associated with these medications.
3. Fever may be the result of a toxic ingestion such as Benadryl and other anticholinergics. Risk of toxic ingestion should be considered in all febrile pediatric patients.
4. Ibuprofen should not be utilized to facilitate treat and release situations. Administration should only be performed if transport is initiated.

NUTRITIONAL SUPPLEMENTS

SCOPE OF PRACTICE

EMT-Paramedic - Drug allowed for monitoring in Transport.

Requires an infusion pump when given by continuous infusion.

CLASS OF DRUG

Nutritional Supplement

INDICATIONS

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 dependent on patient condition and needs.
4. Progress should be carefully monitored and documented on a flowchart.

COMPLICATIONS

1. If given IV/IO, 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®)

SCOPE OF PRACTICE

EMT-Paramedic - Drug allowed for monitoring in Transport.

Requires an infusion pump when given by continuous infusion.

CLASS OF DRUG

Hormone (gastrointestinal)

Antidiarrheal

PHARMACOLOGIC ACTION

Octreotide exerts pharmacologic actions similar to the natural hormone, somatostatin. It is an even more potent inhibitor of growth hormone, glucagon, and insulin than somatostatin. Like somatostatin, it also suppresses LH response to GnRH, decreases splanchnic blood flow, and inhibits release of serotonin, gastrin, vasoactive intestinal peptide, secretin, motilin, and pancreatic polypeptide.

INDICATIONS

1. 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

1. Follow physician’s order

SPECIAL NOTES

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

OVER THE COUNTER MEDICATIONS (OTC)

SCOPE OF PRACTICE

First Responder, EMT-Basic, EMT-Intermediate, & EMT-Paramedic

CLASS OF DRUG

Drugs not classified as controlled or dangerous substances

PHARMACOLOGIC ACTION

Drug and dose dependent

INDICATIONS

Dependent on patient needs and condition

CONTRAINDICATIONS

Dependent on patient needs and condition

DRUG INTERACTION

Drug and dose dependent

ADMINISTRATION

Dependent on patient needs and condition and physician orders

SPECIAL NOTES

1. A physician medical director may approve a list of over the counter (OTC) medications and products (i.e. NSAID's, antihistamines, anti-diarrheal**,** laxatives, antacids, vitamin supplements, hygiene products and other products) for distribution by an EMS caregiver working under medical direction to a requesting individual during scheduled stand-by situations.
2. Examples include:
    2. Long term wildfire responses
    3. Public events (concerts, rodeos, etc), various industry situations such as movie production
    4. Ski Patrol
    5. Long term construction & manufacturing projects
    6. Long term search and rescue or tactical operations
    7. Other situations where scheduled stand-by EMS is provided.
3. The OTC medication/product must be properly labeled in individual dose packaging when distributed to the patient. Distribution from a bulk or multi-dose container is not permitted by this scope of practice as well as other state and federal laws and regulations; medications will be distributed per manufacturer recommendations and labeling directions.
4. The agency/EMS caregiver will maintain a written guideline that contains the list of physician approved OTC medications/products and the conditions for which they may be distributed. Specific dosing information and indications for pediatric patients must be included.
5. The EMS agency/EMS caregiver must develop a method of documentation for the appropriate distribution of the OTC medications/products. This documentation shall include the OTC medication documentation and appropriate patient care report, per 7.27.10.12 (Records and Data Collection, NMAC) and 7.27.11.11 (NMAC). PRC certified ambulance agencies shall complete patient care documentation per 18.3.14.24 (NMAC).

(Continued next page)

OVER THE COUNTER MEDICATIONS (OTC) (Cont.)

6. OTC medications/products are distributed for the patient's self-administration and use.
7. EMS caregivers will not administer OTC medications/products, unless approved elsewhere in the scope of practice for specific EMS patient care situations.

OXYGEN

SCOPE OF PRACTICE

First Responder, EMT-Basic, EMT-Intermediate and EMT-Paramedic

CLASS OF DRUG

Class III Gas, Oxidizer

PHARMACOLOGIC ACTION

Appropriate levels of oxygen are vital to support cell respiration. Oxygen plays an important role in the energy metabolism of living organisms.

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

1. Adult & Pediatric:

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

SPECIAL NOTES

1. If the patient is not breathing adequately on their own, the treatment of choice is assisted ventilation, not just supplemental 02.
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 02 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®)

SCOPE OF PRACTICE

EMT-Paramedic

CLASS OF DRUG

Pituitary hormone - uterine vasoconstrictor

PHARMACOLOGIC ACTION

Oxytocin stimulates the upper segment of the myometrium to contract rhythmically, which constricts spiral arteries and decreases blood flow through the uterus.

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

1. Adult
    i. 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.
    ii. Intramuscular dose: [10 USP units] (1 ml) IM only if unable to start IV/IO

SPECIAL NOTES

1. None

PHENYLEPHRINE (NEO-SYNEPHRINE®) NASAL SPRAY

SCOPE OF PRACTICE

EMT-Paramedic

CLASS OF DRUG

Alpha-adrenergic agent

Vasoconstrictor (nasal)

PHARMACOLOGIC ACTION

Phenylephrine is primarily a direct-acting sympathomimetic amine, which stimulates alpha-adrenergic receptors.

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

1. 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

SCOPE OF PRACTICE

[1]EMT-Intermediate, [2]EMT-Paramedic - Drug allowed for monitoring in Transport.

[1]IV solutions that contain potassium during transport (not to exceed 20 mEq/1000cc or more than 10 mEq/hour).

[2]Infusion pump needed if concentration is greater than 20mEq/1000cc.

CLASS OF DRUG

Electrolyte

PHARMACOLOGIC ACTION

Potassium is the major cation of intracellular fluid and is essential for the conduction of nerve impulses in heart, brain, and skeletal muscle; contraction of cardiac, skeletal and smooth muscles; maintenance of normal renal function, acid-base balance, carbohydrate metabolism, and gastric secretion

INDICATIONS

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

1. Adult:[10 to 20 mEq/hour] IV/IO drip is standard dose dependent upon patient presentation. Paramedics only can transport a patient receiving concentration of greater than 20 mEq/1000 ml with an infusion pump.
2. Pediatric:[2 - 3 mEq/kg/day] IV

SPECIAL NOTES

1. Cardiac Monitoring required.

PRALIDOXIME (2PAM®)

Protopam®, 2PAM Antidote®, Pralidoxime Auto Injector®, a component of Mark I® kits and DuoDote®

SCOPE OF PRACTICE

[1]First Responder, [1]EMT-Basic, [1]EMT-Intermediate and [1]EMT-Paramedic

[1] IM injection for treatment of chemical and/or nerve agent exposure, via auto injector only.

CLASS OF DRUG

Cholinesterase re-activator, toxicity antidote

PHARMACOLOGIC ACTION

Binds to organophosphates and breaks alkyl phosphate-cholinesterase bond to restore activity of acetylcholinesterase

INDICATIONS

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

CONTRAINDICATIONS

1. Documented hypersensitivity

DRUG INTERACTION

1. None

ADMINISTRATION

1. Adult
    i. [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®)

SCOPE OF PRACTICE

EMT-Paramedic - Drug allowed for monitoring in Transport.

Requires an infusion pump when given by continuous infusion

CLASS OF DRUG

Antidysrhythmic

PHARMACOLOGIC ACTION

Class Ia (membrane stabilizing) antidysrhythmic agent; inhibits recovery after repolarization resulting in decreasing myocardial excitability and conduction velocity. Direct membrane depressant that decreases conduction velocity, prolongs refractoriness, decreases automaticity and reduces repolarization abnormalities

INDICATIONS (Authorized for monitoring during inter-facility transport)

1. Sustained regular, wide complex tachycardia (with pulse)

CONTRAINDICATIONS

1. Pre-existing QT prolongation or torsades de pointes
2. Complete heart block, second or third degree AV block
3. Hypersensitivity
4. Systemic lupus erythematosus (SLE)

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

1. Follow physician's orders
2. Stop administration if:
    i. The arrhythmia disappears
    ii. Hypotension ensues
    iii. The QRS is widened by 50% of its original width
    iv. A total of 17 mg/kg of the medication has been administered
3. Adult: Infusion [1 gm] in 250 ml D5W or NS at 1 to 4 mg per minute
4. 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.

PROPOFOL (DIPRIVAN®)

SCOPE OF PRACTICE

[1]EMT-Paramedic - Medication for administration during patient transport.

[1] In patients that are intubated prior to transport

CLASS OF DRUG

Anesthetic

PHARMACOLOGIC ACTION

Propofol works by increasing GABA-mediated inhibitory tone in the CNS. Propofol decreases the rate of dissociation of the GABA from the receptor, thereby increasing the duration of the GABA-activated opening of the chloride channel with resulting hyperpolarization of cell membranes. At supraclinical concentrations, it may directly activate the receptor's chloride channel.

INDICATIONS **(For administration by IV/IO 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

1. Follow physician's orders

SPECIAL NOTES

1. Avoid rapid IV/IO 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

SCOPE OF PRACTICE

EMT-Paramedic - Medication for administration during patient transport.

CLASS OF DRUG

Antagonist to heparin

PHARMACOLOGIC ACTION

When administered alone, protamine has an anticoagulant effect due to an interaction with platelets and with many proteins including fibrinogen. However, when it is given in the presence of heparin (which is strongly acidic), a stable salt is formed and the anticoagulant activity of both drugs is lost.

INDICATIONS

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
3. Given by IV/IO 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®)

SCOPE OF PRACTICE

EMT-Paramedic - Drug allowed for monitoring in Transport.

Requires an infusion pump when given by continuous infusion

CLASS OF DRUG

Proton pump inhibitor – diminishes daily production of acid

PHARMACOLOGIC ACTION

Proton pump inhibitors act by irreversibly blocking the hydrogen/potassium adenosine triphosphatase enzyme system (the H+/K+ ATPase, or, more commonly, the gastric proton pump) of the gastric parietal cells.[3] The proton pump is the terminal stage in gastric acid secretion, being directly responsible for secreting H+ ions into the gastric lumen, making it an ideal target for inhibiting acid secretion.

INDICATIONS

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

1. Follow physician’s orders

SPECIAL NOTES

1. Use with caution in severe liver disease

SODIUM BICARBONATE

SCOPE OF PRACTICE

EMT-Paramedic

CLASS OF DRUG

Alkalinizing agent

PHARMACOLOGIC ACTION

Increases blood and urinary pH by releasing a bicarbonate ion, which in turn neutralizes hydrogen ion concentrations

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. Known pre-existing hyperkalemia
4. Overdoses of tricyclic antidepressants or phenobarbital.

CONTRAINDICATIONS

1. Documented hypersensitivity
2. Severe pulmonary edema

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
    i. Adult & Pediatric: [1 mEq/kg] IV/IO initially, then [0.5 mEq/kg] no more than 50 mEq every 10 minutes until a pulse is restored or as indicated by ABGs.
2. Other special circumstances, such as tricyclic antidepressant overdose
    i. Adult & Pediatric [1 mEq/kg] IV/IO single dose per physician order

SPECIAL NOTES

1. The routine use of Sodium Bicarbonate is not recommended for patients in cardiac arrest.
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.
3. Hyperosmolarity of the blood can occur because the NaHCO3 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 are more important than bicarbonate.

SODIUM NITROPRUSSIDE (NIPRIDE®)

SCOPE OF PRACTICE

EMT-Paramedic - Drug allowed for monitoring in Transport.

Requires an infusion pump when given by continuous infusion

CLASS OF DRUG

Potent antihypertensive agent; vasodilator

PHARMACOLOGIC ACTION

Sodium nitroprusside breaks down in circulation to release nitric oxide (NO).[3] It does this by binding to oxyhaemoglobin to release cyanide, methaemoglobin and nitric oxide.[3] NO activates guanylate cyclase in vascular smooth muscle and increases intracellular production of cGMP. cGMP activates protein kinase G which activates phosphatases which inactivate myosin light chains.[33] Myosin light chains are involved in muscle contraction. The end result is vascular smooth muscle relaxation, which allow vessels to dilate.[33] This mechanism is similar to that of phosphodiesterase 5 (PDE5) inhibitors such as sildenafil (Viagra) and tadalafil (Cialis), which elevate cGMP concentration by inhibiting its degradation by PDE5.[

INDICATIONS

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

1. Follow physician’s orders

SPECIAL NOTES

1. Solution bag line must be covered in opaque material.
2. Solution is stable for only 24 hours.

SPECIAL CIRCUMSTANCES

Situations may arise involving patients with uncommon conditions requiring specific out of hospital administered medications or procedures; family members or the designated caregiver trained and knowledgeable of the special needs of the patient should be recognized as the expert regarding the care of the patient; EMS can offer assistance in airway management appropriate to their level of licensure, and administer the patient's prescribed medications where appropriate only if the medication is in the EMS provider's scope of practice; EMS services are not expected to provide the prescribed medications for these special needs patient.

TERBUTALINE (BRETHINE®)

SCOPE OF PRACTICE

EMT-Paramedic - Drug allowed for monitoring in Transport.

Requires an infusion pump when given by continuous infusion

CLASS OF DRUG

Bronchodilator, uterine smooth muscle relaxant

PHARMACOLOGIC ACTION

It attaches to beta adrenergic receptors on muscles surrounding the air passages, causing the muscles to relax and dilate the air passages. Wider air passages allow more air to flow in and out of the lungs. Increased airflow reduces shortness of breath, wheezing, and cough. Also is used for delaying premature labor by relaxing the muscles of the uterus that are responsible for expelling the fetus at the time of delivery.

INDICATIONS

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. Follow physician’s orders

SPECIAL NOTES

1. None

THIAMINE

SCOPE OF PRACTICE

EMT-Paramedic

CLASS OF DRUG

Vitamin (B1)

PHARMACOLOGIC ACTION

Thiamine combines with adenosine triphosphate (ATP) to form a coenzyme, thiamine pyrophosphate (thiamine diphosphate, cocarboxylase), which is necessary for carbohydrate metabolism.

INDICATIONS

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

CONTRAINDICATIONS

1. None in the emergency setting.

DRUG INTERACTION

1. There are no significant drug interactions with other emergency medications.

ADMINISTRATION

1. Adult:[100 mg] slow IV/IO or IM.
2. Pediatric:[10-25 mg] slow IV/IO or IM.

SPECIAL NOTES

1. Large IV doses may cause respiratory difficulties.

THROMBOLYTICS (FIBRINOLYTICS)

Alteplase - {tPA}®, Streptokinase, Anistreplase, Urokinase

SCOPE OF PRACTICE

EMT-Paramedic - Drug allowed for monitoring in Transport.

Requires an infusion pump when given by continuous infusion

CLASS OF DRUG

Thrombolytics/fibrinolytics

PHARMACOLOGIC ACTION

Thrombolytic drugs dissolve blood clots by activating plasminogen, which forms a cleaved product called plasmin. Plasmin is a proteolytic enzyme that is capable of breaking cross-links between fibrin molecules, which provide the structural integrity of blood clots. Because of these actions, thrombolytic drugs are also called "plasminogen activators" and "fibrinolytic drugs."

INDICATIONS

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.

ADMINISTRATION

NOTE: Doses vary per physician direction

1. Follow physician’s orders

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 anaphylaxis can occur when administering this medication.

THROMBOLYTICS (FIBRINOLYTICS) (cont.)

Reteplase - Retavase®

SCOPE OF PRACTICE

EMT-Paramedic - Medication for administration during patient transport. Second dose only.

CLASS OF DRUG

Thrombolytic

PHARMACOLOGIC ACTION

Reteplase binds to fibrin rich clots via the fibronectin finger-like domain and the Kringle 2 domain. The protease domain then cleaves the Arg/Val bond in plasminogen to form plasmin. Plasmin in turn degrades the fibrin matrix of the thrombus, thereby exerting its thrombolytic action.

INDICATIONS

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

1. Follow physician’s orders

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 anaphylaxis can occur when administering this medication.

TOPICAL OPHTHALMIC ANESTHETIC

(PROPARACAINE® - OPHTHAINE®, ALACAINE ®)

SCOPE OF PRACTICE

EMT-Paramedic

CLASS OF DRUG

Topical/local ophthalmic anesthetic

PHARMACOLOGIC ACTION

After topical application to the eye, local anesthetics penetrate to sensory nerve endings in the corneal tissue. These medications block both the initiation and conduction of nerve impulses by decreasing the neuronal membrane's permeability to sodium ions. This reversibly stabilizes the membrane and inhibits depolarization, resulting in the failure of a propagated action potential and subsequent conduction blockade.

INDICATIONS

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.

TRANEXAMIC ACID (TXA)

SCOPE OF PRACTICE

EMT-Paramedic -

CLASS OF DRUG

Plasminogen inhibitor

PHARMACOLOGIC ACTION

Tranexamic acid is an antifibrinolytic that competitively inhibits the activation of plasminogen to plasmin. Tranexamic acid is a competitive inhibitor of plasminogen activation, and at much higher concentrations, a noncompetitive inhibitor of plasmin, i.e., actions similar to aminocaproic acid.

INDICATIONS

1. Traumatic hemorrhage in patients > 15 years of age who are candidates for massive blood intransfusion

CONTRAINDICATIONS

1. Hypersensitivity
2. Subarachnoid hemorrhage
3. Thrombosis or thromboembolism

DRUG INTERACTION

1. None

ADMINISTRATION

1. Follow physician's orders
2. 1st Dose - 1 gm infused over 10 minutes (IV infusion rates faster than this have shown to cause hypotension).
3. 2nd Dose – 1 gm administered over 8 hours

SPECIAL NOTES

1. The bolus of TXA must be administered within the first 3 hours **after the trauma**. Past this 3-hour mark, not only has TXA been shown to be of no value, it has also been shown to cause significant issues post-resuscitation.
2. TXA for trauma has not been approved for administration in patients<18 YOA.
3. At this time, TXA has been approved by the FDA for IV administration only.

VACCINES

COVID
DPT (Diptheria, Tetanus (Acellular), Pertussis),
TT (Tetanus Toxoid), DT (Diptheria, Tetanus)
DTP/DTaP
Hepatitis B Vaccine (RECOMBIVAX HB®, ENGERIX-B®)
Hepatitis A Vaccine (HAVRIX®, VAQTA®)
Measles, Mumps, Rubella (MMR)
Poliovirus Vaccine - live, Orimune (OPV)
Poliomyelitis Vaccine, Inactivated, IPV, Salk
Pneumococcal Vaccine (PNEUMOVAX®)
Varicella (chicken pox) vaccine

SCOPE OF PRACTICE

[1]EMT-Basic, [2]EMT-Intermediate and [2]EMT-Paramedic

[1]Administration of Immunizations, Vaccines, Biologicals,

and TB skin testing is authorized under the following circumstances:

1. In the event of a disaster or emergency, the State EMS Medical Director or Chief Medical Officer of the Department of Health may temporarily authorize the administration of pharmaceuticals or tests.

[2]Administration of Immunizations, Vaccines, Biologicals, and TB skin testing is authorized under the following circumstances:

1. To the general public as part of a Department of Health initiative or emergency response, utilizing Department of Health protocols. The administration of immunizations is to be under the supervision of a physician, nurse, or other authorized health provider.
2. Administer vaccines to EMS and public safety personnel
3. TB skin tests may be applied and interpreted if the licensed provider has successfully completed required Department of Health training.
4. In the event of a disaster or emergency, the State EMS Medical Director or Chief Medical Officer of the Department of Health may temporarily authorize the administration of pharmaceuticals or tests not listed above

ADMINISTRATION

1. Follow physician’s orders

VASOPRESSIN (PITRESSIN®)

SCOPE OF PRACTICE (Removed from ACLS in 2015 Guidelines)

EMT-Paramedic

CLASS OF DRUG

Hormone (antidiuretic)

PHARMACOLOGIC ACTION

Vasopressin acts on three different receptors, vasopressin receptor V1a (which initiates vasoconstriction, liver gluconeogenesis, platelet aggregation and release of factor VIII), vasopressin receptor V1b (which mediates corticotrophin secretion from the pituitary) and vasopressin receptor V2 which controls free water reabsorption in the renal medullar. The binding of vasopressin to the V2 receptor activates adenylate cyclase which causes the release of aquaporin 2 channels into the cells lining the renal medullar duct. This allows water to be reabsorbed down an osmotic gradient so the urine is more concentrated.

INDICATIONS

1. 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

1. IV infusion 0.01-0.04 units/min

SPECIAL NOTES

1. Potent vasoconstrictor. Increased peripheral vascular resistance may provoke cardiac ischemia and angina.
2. Do not use in responsive patients with coronary artery disease.

VASOPRESSOR AGENTS

Dopamine Hydrochloride (Dopastat®, Intropin®)

SCOPE OF PRACTICE

EMT-Paramedic

CLASS OF DRUG

Inotropic agent; catecholamine; pressor

PHARMACOLOGIC ACTION

Endogenous catecholamine, acting on both dopaminergic and adrenergic neurons. Low dose stimulates mainly dopaminergic receptors, producing renal and mesenteric vasodilation; higher dose stimulates both beta-1-adrenergic and dopaminergic receptors, producing cardiac stimulation and renal vasodilation; large dose stimulates alpha-adrenergic receptors

INDICATIONS

1. As a pressor agent used in the management of shock
2. May be useful, at low doses, in renal failure
3. Used for refractory bradycardia unresponsive to atropine, and when pacing is unavailable.

CONTRAINDICATIONS

1. Hypersensitivity to dopamine
2. Pheochromocytoma
3. Ventricular Fibrillation
4. Uncorrected tachydysrhythmias

DRUG INTERACTION

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

ADMINISTRATION

1. Adult:IV infusion ONLY – Standard mix 400 mg in 250 ml D5W or NS to produce a concentration of 1600 mcg/ml. Infusion rates [5.0-20.0 mcg/kg/min] titrated to desired effect. (Other concentrations are used, so know what you are using). Use microdrip chamber or an infusion pump.
2. 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.
2. Doses less than 5mcg/kg can lower B/P.

VASOPRESSOR AGENTS (cont.)

Norepinephrine (Levophed®)

SCOPE OF PRACTICE

EMT-Paramedic

CLASS OF DRUG

Alpha/beta adrenergic agonist

PHARMACOLOGIC ACTION

Strong beta-1 and alpha-adrenergic effects and moderate beta-2 effects, which increase cardiac output and heart rate, decrease renal perfusion and peripheral vascular resistance, and cause variable BP effects.

INDICATIONS

1. Pressor agent for the management of shock

CONTRAINDICATIONS:

1. Hypersensitivity
2. Hypotension due to blood volume deficit,
3. Peripheral vascular thrombosis (except for lifesaving procedures)

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 simulation.
5. Ergot alkaloids or oxytocin may result in enhanced vasoconstriction.

WARNING: Norepinephrine is a vesicant and can cause severe tissue damage if extravasation occurs. Do not use in the same IV line as alkaline solutions as these may deactivate it.

ADMINISTRATION

1. [4 mcg/min] IV/IO infusion, may increase by 2 mcg/min q 5 mins up to a max dose of 10 mcg/min.

SPECIAL NOTES

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