

Appendix J

Adenosine (Adenocard)

A chemical hyperpolarization agent and diagnostic aid for Narrow-Complex Tachycardias

Narrow-Complex Tachycardia

6 mg/2 mL vial × 3 (Drug Box)

- Adenosine induces a transient heart block in the AV node, and may be able to break certain forms of SVT, converting to normal conduction (i.e., SR or ST)
- Fast rhythms of the heart that are confined to the atria (e.g., atrial fibrillation, atrial flutter) or ventricles (e.g., monomorphic ventricular tachycardia) and do not involve the AV node as part of the re-entrant circuit are not typically converted
 - ventricular response rate is temporarily slowed with adenosine in such cases and may be of use as diagnostic aid
- Remarkably short half life
- Must be administered fast IV push with ready bolus flush without delay
- Use of a 3-way stopcock may facilitate delivery
- Will not affect atrial fibrillation, atrial flutter or ventricular tachycardia

Indications for use

- Symptomatic Paroxysmal Supraventricular Tachycardia

Contraindications for use

- Second or third degree A-V block (except in patients with a functioning pacemaker)
- Sick Sinus Syndrome (except in patients with a functioning pacemaker)
- Poison induced tachycardia
- Patients with a known hyper sensitivity to Adenosine

Precautions

- The effects of adenosine are antagonized by methylxanthines such as caffeine and theophylline, so larger doses of adenosine may be required to be effective
- Use with caution in patients with asthma

Dosage

- Adult dosage - Initial 6 mg rapid IV push with immediate 10 ml NS flush , if desired effect not obtained within 1-2 minutes, then consider repeat dosage of 12 mg
- Pediatric dosage - initial dosage 0.1 mg/kg rapid IV push with 10 ml NS flush, if desired effect is not obtained within 1-2 minutes then consider 0.2 mg/kg not to exceed 12 mg

Albuterol Sulfate (Proventil)

A sympathomimetic for bronchial dilation or potassium transport agent in Crush

Difficulty Breathing, Crush Syndrome

2.5 mg bullet × 6 (3 Drug Box and 3 IV Box)

- Albuterol produces bronchodilation by relaxing bronchial smooth muscle through beta-2 receptor stimulation. In addition, it can help drive potassium back in to cells afflicted by Crush Syndrome injuries, combating hyperkalemia-associated complications
- For severe distress and/or breathing difficulty which has not responded to home treatments, a cocktail of 2.5 mg Albuterol and 0.5 mg Atrovent may be a more appropriate first-line treatment
- May commonly induce tachycardia and tremor
- Should be given any time a CHF patient is wheezing
- Should be given on a continuous basis for Crush
- HHN flow rates should be 4-6 L/min or 8-10 L/min when utilizing a mask
- May require coaching to properly administer to some patients

Indications

- Asthma, status asthmaticus
- Crush injury
- Bronchospasm in patients with reversible obstructive airway disease

Contraindications

- Symptomatic tachycardia
- Any known hypersensitivity to the drug

Precautions

- Patients with cardiovascular disorders (coronary insufficiency, arrhythmias, hypertension, etc.)
- Convulsive disorders and diabetes
- Blood pressure, pulse should be monitored

Dosage

- | | |
|----------------------------------|----------------------------------|
| • Adult Breathing Difficulty | 2.5 mg HHN |
| • Crush Syndrome | 2.5 mg HHN continuous treatments |
| • Pediatric Breathing Difficulty | 2.5 mg HHN |

Amiodarone (Cordarone)

A dysrhythmic for wide-complex tachycardias and ventricular fibrillation

Wide-Complex Tachycardia, Ventricular Fibrillation, ROSC

150 mg/3 mL vial × 3 (Drug Box)

A complex dysrhythmic, its action is not entirely understood, though is thought to involve prolonging the action potential duration, prolonging the refractory period, or interacting with K⁺ channels.

- Never given IV push to a perfusing rhythm, and never given via ETT
- Remarkably long half-life (25-100 days, average 58) within the body
- Viscous, and easily foams when drawn up rapidly with smaller gauge needles
- Flush IV line thoroughly when administered in the same IV line as furosemide, heparin or sodium bicarbonate
- Use Zofran with caution due risk of dysrhythmias due to prolonged Q-T intervals

Indications

- Ventricular fibrillation
- Pulseless ventricular tachycardia
- Ventricular tachycardia with a pulse

Contraindications

- Hemodynamically significant bradycardia
- 2nd and 3rd degree heart blocks unless patient has a functioning pacemaker
- Any known hypersensitivity to the drug

Precautions

- Use with caution with patients that are currently taking
 - Beta blockers
 - Calcium channel blockers
 - Anticoagulants
- Heart failure

Dosage

- | | |
|--------------------------------------|---------------------------------------|
| • Wide Complex Tachycardia | 150 mg in 100 ml NS given over 10 min |
| • Ventricular Fibrillation | 300 mg IVP |
| • ROSC | 150 mg in 100 ml NS given over 10 min |
| • Pediatric Wide Complex Tachycardia | 5 mg/kg over 20 min |
| • Pediatric Ventricular Fibrillation | 5 mg/kg over 10 min |

Aspirin (acetylsalicylic acid, ASA)

An antiplatelet for suspected cardiac ischemia and barotrauma

Chest Pain/AMI/ACS, Diving Medical Disorders

81 mg tablets × 8 (IV Box)

- Aspirin's antiplatelet property works by inhibiting the production of thromboxane, a platelet binding agent, and is different from other common blood thinners such as plavix or coumadin
- Early administration during chest pain serves as a cardioprotective agent to reduce the impact of infarct, and the risk of secondary MI
- EMT-B may administer with physician orders as well as your agency OMD approval
- If patient has taken aspirin within 1 day, administer additional aspirin up to the maximum protocol directed dose
- Contraindicated with history of GI bleeding or other bleeding disorders, recent surgery (within 14 days), recently taken maximum dose of aspirin prior to EMS arrival and sensitivity/allergy to aspirin. Contact medical control for guidance

Indications

- Suspected acute myocardial infarction
- Diving medical disorders

Contraindications

- Aspirin should be used cautiously in patients with peptic ulcer disease or poor kidney function
- Patients with hypersensitivity to aspirin and other non-steroidal anti-inflammatory drugs should not receive aspirin
 - NSAID Examples
 - Motrin®
 - Aleve®
 - Advil®

Precautions

- Aspirin should be avoided by patients with peptic ulcer disease or poor kidney function
- Aspirin should be avoided by patients taking blood thinning medications (Coumadin)

Dosage

- Chest Pains 4-81 mg tablets (324 mg)
- Diving Medical Disorders 8-81 mg tablets (648 mg)

Ativan (Lorazepam)

A potent benzodiazepine anticonvulsant for seizures and seizures proximal to chemical exposure

Seizures, Combative Patient

2 mg/mL vial × 2 (Drug Box)

Ativan (lorazepam) is the preferred drug for seizures due to efficacy and duration

- Dilute in an equal amount of NS for IV/IO administration
- Dose 2 mg slow IV push (over 2 minutes)
- May be administered IM if IV/IO access is not available. Do not dilute if administering IM
- May repeat with physician order up to max dose of 8 mg
- Action is potentiated in conjunction with Haldol
- Medical control may order 1 mg for post seizure patients to prevent further seizures
- Risk for respiratory depression and bradycardia, and should be administered with ECG and SpO₂ monitoring.
- Inadvertent arterial injection may result in arteriospasm
- Ineffective if administered rectally; administer Valium instead

Indications

- Status epilepticus
- Major motor seizure
- Premedication prior to cardioversion
- Combative patients

Contraindications

- Patients with a known hypersensitivity to the medication

Precautions

- Should be diluted with normal saline prior to IV/IO administration
- Use with caution in patients with acute narrow angle glaucoma
- Coma, shock or suspected drug abuse
- Has a short duration of effect

Dosage

- | | |
|---------------------|---|
| • Seizure | 2 mg IV/IM/ IO, may repeat with a physician order up to a max. 8 mg |
| • Pediatric Seizure | 0.1 mg/kg IV/IM/IO 2 mg max., may repeat with a physician order |
| • Combative patient | 2 mg IM in large muscle mass |

Atropine

An antimuscarinic to increase heart rate or dry secretions

Asystole, PEA, Bradycardia, RSI, Chemical Exposure

1 mg/10 mL preloaded syringe × 3 (Drug Box)

Increases firing of the sinoatrial node (SA) and conduction through the atrioventricular node (AV) of the heart.

- May be less/not effective in PEA with rates above 60
- Not an actual antidote for organophosphate poisoning, but blocks the action of acetylcholine at muscarinic receptors; as a treatment for SLUDGE-style poisons such as organophosphate insecticides and nerve gases, including Tabun (GA), Sarin (GB), Soman (GD) and VX. Consider early alert to medical control as field supplies are insufficient for prolonged SLUDGE-management

Indications

- Hemodynamically unstable sinus bradycardia
- Asystole
- Organophosphate poisoning

Contraindications

- None when used in emergency situations

Precautions

- Dose of 3 mg should not be exceeded except in cases of organophosphate poisoning
- May cause tachycardia (caution in acute MI)
- May cause hypertension
- May be ineffective in patients that have 2nd degree type II or 3rd degree heart blocks with a widened QRS complex

Dosage

- | | |
|-----------------------------|--|
| • Bradycardia | 0.5mg every 3 to 5 minutes, as needed up to a max. of 3 mg |
| • Asystole | 1 mg every 3 to 5 minutes, as needed up to a max. of 3 mg |
| • Organophosphate poisoning | 2 to 5 mg |
| • Pediatric Bradycardia | 0.02 mg/kg (0.1 mg minimum dose; maximum single dose 0.5 mg in a child; 1 mg in an adolescent) |

Atrovent (ipratropium bromide)

An anticholinergic for bronchial dilation

Difficulty Breathing (Asthma/COPD)

0.5 mg bullet × 2 (1 Drug Box and 1 IV Box)

- Atrovent is an anticholinergic (parasympatholytic) agent inhibiting vagally-mediated reflexes by antagonizing the action of acetylcholine
- For severe distress and/or breathing difficulty which have not responded to home treatments, a combination treatment of 2.5 mg Albuterol and 0.5 mg Atrovent may be a more appropriate first-line
- With a 2 hour half-life, only 1 dose is allowed under standing orders
- HHN flow rates should be 4-6 L/min or 8-10 L/min when utilizing a mask
- May require coaching to properly administer to some patients

Indications

- Asthma as an adjunct to Albuterol
- Bronchospasm associated with bronchitis and emphysema

Contraindications

- Patients with known hypersensitivity to the drug or to atropine

Precautions

- Caution when used in elderly and those with cardiovascular disease or hypotension

Dosage

- Adult Dosage 0.5 mg in 2.5 ml (unit dose) mixed in nebulizer with 2.5 mg/3 ml (unit dose) Albuterol Sulfate (Proventil)
- Pediatric Dosage 0.5 mg in 2.5 ml (unit dose) mixed in nebulizer with 2.5 mg/3 ml (unit dose) Albuterol Sulfate (Proventil)

Benadryl (diphenhydramine)

An antihistamine for allergic reaction and anticholinergic for dystonic reaction

Allergic Reaction, Combative Patient

50 mg/1 mL vial × 2 (Drug Box)

- Benadryl works to combat and blunt the histamine response found in allergic reaction, and has a mild-to-moderate CNS sedative effect
- Consider if patient exhibits signs of a dystonic reaction following Haldol administration in the Combative Patient protocol
 - Although an antihistamine, also possesses significant anticholinergic properties; it may help in balancing cholinergic and dopaminergic activity

Indications

- Anaphylaxis
- Allergic reactions
- Dystonic reactions after Haldol administration

Contraindications

- Asthma
- Nursing Mothers
- Glaucoma
- Patients taking MAOI medications

Precautions

- Hypotension

Dosage

- Adult Dosage 50 mg IV/IO/Deep IM
- Pediatric Dosage 1 mg/kg up to a total dose of 50 mg, may repeat once

Calcium Chloride

An ionic agent for cardiac arrest in dialysis/renal failure patients, and cellular stabilizing agent in Crush Syndrome

Wide-Complex Tachycardia, Ventricular Fibrillation, PEA, Asystole, Crush, Renal Failure

1 g/10 mL vial × 1 (Drug Box)

- May help to correct or blunt the effects of abnormal blood chemistry (K, Ca, Na)
- Temporary cellular stabilizing agent in Crush Syndrome, but Calcium Gluconate is preferred
- Flush lines and administration site when used in conjunction with sodium bicarbonate

Indications

- Full arrest in renal dialysis patient
- Magnesium Sulfate overdose
- Acute hypocalcemia
- Acute hyperkalemia
- Verapamil and other calcium channel blocker overdose

Contraindications

- Simultaneous use with sodium bicarbonate
- Digitalis toxicity
- May cause Ventricular Fibrillation in patients receiving digitalis

Precautions

- Sudden death may occur when given too rapidly
- Causes tissue irritation and necrosis if infiltration at the IV site

Dosage

- Adult dosage 0.5 – 1 gram (5-10 ml), slow IVP
- Pediatric dosage 20 mg/kg
- Crush Injury 1gram over 3 min IVP. Flush line with 40-60 ml NS (MUST flush IV line thoroughly when administered in the same IV line as Sodium Bicarbonate to prevent precipitation of medication)

D_{50W} (Dextrose 50%)

A concentrated sugar suspension for hypoglycemia complications, and in conjunction with insulin for hyperkalemia in Crush Syndrome

Seizures, Hypoglycemia, Crush Syndrome

25 g/50 mL prefilled syringe × 2 (Drug Box)

- Must ensure patency of IV line prior to administration as infiltration may lead to local tissue necrosis.
- May be administered rectally with physician order

Indications

- Hypoglycemia

Contraindications

- Few when used in the emergency setting
- Intracranial hemorrhages

Precautions

- Blood sample should be drawn before administration in adults

Dosage

- | | |
|-----------------------------------|---|
| • Hypoglycemia | 25 grams (50 ml) |
| • Crush Syndrome | 25 grams IV (if insulin is unavailable) |
| • Pediatric dosage- Newborn | 2 ml/kg D10 (To make Dextrose 10% expel 40 ml of the preloaded syringe and draw up 40 ml of NS) |
| • Pediatric dosage- < 2 years old | 2 ml/kg D25 (To make Dextrose 25% expel 25 ml of the preloaded syringe and draw up 25 ml of NS) |
| • Pediatric dosage- > 2 years old | 2 ml/kg D50 |

Dopamine (*Intropin*)

A potent catecholamine to increase blood pressure and heart rate

ROSC, Bradycardia, Shock/Non-Traumatic, Breathing Difficulty

400 mg/10 mL vial × 1 (Drug Box)

- Dopamine, a complex neurotransmitter which acts on the sympathetic nervous system to increase blood pressure via vasoconstriction and increased heart rate
- Peripheral effects outside the CNS are dose dependent:
 - 2 to 5 µg/kg/min dilate blood vessels, increase blood flow to renal, mesenteric, and coronary arteries, and increase overall renal perfusion. Begins to affect the heart at the lower doses, from about 3 mcg/kg/min IV
 - 5 to 10 mcg/kg/min additionally have a positive inotropic and chronotropic effect through increased β_1 receptor activation
 - 10 to 20 mcg/kg/min additionally cause vasoconstriction, increased systemic vascular resistance, and increased blood pressure through α_1 receptor activation.
- Care must be exercised in titrating and calculating dosage as higher dosages may be detrimental to internal organs
- Contraindicated in hypovolemia

Indications

- Cardiogenic Shock
- Non-hypovolemic shock (when fluid resuscitation is ineffective)

Contraindications

- Hypovolemic shock

Precautions

- Should not be administered to patients with severe tachydysrhythmias
- Should not be administered to patients with ventricular fibrillation or ventricular irritability

Dosage

- Adult dosage 2-20 mcg/kg/min
- Pediatric dosage 2-20 mcg/kg/min

Epinephrine 1:1000

A profound α and β agonist to open airways or increase heart rate

Allergic/Anaphylactic Reaction, Breathing Difficulty (Asthma), Bradycardia

1 mg/1 mL ampule × 3 (Drug Box)

Bronchodilator, vasoconstrictor that increases the rate and force of cardiac contractions

- Asthma, not responsive to HHN therapies. IM/SQ epinephrine should be considered in the acute, severe asthma attack
- In hemodynamic instability, Epinephrine 1:1000 IM is the preferred route of administration due to perfusion/uptake issues
- Symptomatic bradycardic patient not responsive to pacing or atropine may need epinephrine drip
- Contact medical control before use in patients with preexisting cardiac history or over the age of 40
- 1:1000 is not indicated for IV/IO injection.

Indications

- Anaphylaxis
- Bronchial Asthma
- Exacerbation of some forms of chronic obstructive pulmonary disease (COPD)

Contraindications

- Hypertension
- Pregnancy
- Patients with tachydysrhythmias

Precautions

- Should be protected from light
- Blood pressure, pulse and EKG must be constantly monitored
- Must call medical control for physicians order in patients older than 40 years of age or patients with a cardiac history

Dosage

- | | |
|----------------------------------|------------------------------|
| • Anaphylaxis | 0.5 mg IM |
| • Pediatric Anaphylaxis | 0.01 mg/kg (max dose 0.5 mg) |
| • Pediatric Breathing Difficulty | 2 ml in 2 ml NS HHN |
| • Adult Bradycardia | 2-10 mcg/min IV Drip |

Epinephrine 1:10000

A profound α agonist for vasoconstriction

Asystole, PEA, Ventricular Fibrillation, Pulseless Ventricular Tachycardia

1 mg/10 mL preloaded syringe × 8 (Drug Box)

Bronchodilator, vasoconstrictor that increases the rate and force of cardiac contractions

- Dosing is repeated every 3-5 minutes during CPR with no maximum
- A significant side effect is increased cardiac irritability

Indications

- Fine ventricular fibrillation
- Asystole
- Pulseless Electrical Activity
- Severe anaphylaxis with hypotension and vascular collapse
- In cases of severe anaphylaxis medical control may order 1:10,000 epinephrine

Contraindications

- None when used as indicated above

Precautions

- Should be protected from heat and light
- Can be deactivated by alkaline solutions (ie Sodium Bicarbonate)

Dosage

- | | |
|-----------------------------------|--|
| • Adult cardiac arrest | 1.0 mg (10 ml) every 3 to 5 minutes |
| • Adult ETT route | 2 to 2.5 mg 1:1,000 diluted in 10 ml saline |
| • Adult severe anaphylaxis | 0.3 mg (3 ml) |
| • Pediatric Allergic/Anaphylactic | 0.01mg/kg max dose 0.5 mg IM |
| • Pediatric ETT route | 0.1 mg /kg added to 2-5 ml NS, maximum 10 ml fluid |

Glucagon for Injection (rDNA origin)

A human hormone which prompts glycogen stores in the body to be converted to glucose

Seizures, Hypoglycemia

1 mg/1 mL (succinate and 1 mL diluent) vial × 1 (Drug Box)

- Treatment for hypoglycemia, may be given when IV access is unavailable to administer D50
- Prolonged hypoglycemia and/or other conditions which have consumed all available glycogen stores (principally concentrated in the liver and large muscle groups) prior to administration render glucagon ineffective in treatment

Indications

- Hypoglycemia without IV access

Contraindications

- Known hypersensitivity to the drug

Precautions

- May be ineffective in patients who may have decreased glycogen stores
 - Alcoholics
 - Malnutrition
 - Renal disease

Dosage

- Adult 1 mg IM
- Pediatrics < 20 kg 1 mg IM
- Pediatrics >20 kg 1 mg IM

Haldol (Haloperidol)

A typical neuroleptic for chemical restraint of the combative patient

Combative Patient

10 mg/2 mL vial × 3 (Drug Box)

- Its principle inclusion to the TEMS drug box to chemically restrain combative patients
- Lowers seizure threshold, and is contraindicated in patients with such histories
- Chemically restrained patients must also be physically restrained
- Haldol is for intramuscular administration only and should never be used intravenously

Indications

- Managing combative patients in the field

Contraindications

- Parkinson's disease
- Seizure disorder
- Coma
- CNS depression

Precautions

- Elderly
- Previous cardiac history
- Patients receiving Lithium treatments
- Impaired liver function
- Orthostatic Hypotension

Dosage

- Adult dosage 5 mg IM, repeat 10 mg IM

Lasix (Furosemide Sulfate)

A loop diuretic for fluid shifting in Breathing Difficulty

Breathing Difficulty

100 mg/10 mL vial × 2 (Drug Box)

- Lasix is a diuretic which works by sodium excretion in the ascending limb of the Loop of Henle in the kidney, and with a weak vasodilatory effect seen sooner after administration than diuresis
- Vasodilatory effect normally seen within 5-10 minutes and diuresis normally seen anywhere from 5-30 minutes
- May not be effective for patients with end-stage renal failure; consult medical control for guidance

Indications

- Congestive heart failure
- Pulmonary edema
- Cerebral edema

Contraindications

- Dehydration

Precautions

- Should be protected from light
- Dehydration
- Pregnancy

Dosage

- Adult dosage 40 mg slow IVP
- Pediatric dosage 2 mg/kg IV/IO

Lidocane

A dysrhythmic for wide-complex tachycardias and ventricular fibrillation, or pain management associated with IO

Wide-Complex Tachycardia, Ventricular Fibrillation, ROSC, RSI, Vascular Access

100 mg/5 mL prefilled syringe × 4 (Drug Box)

- A sodium channel blockade and second-line dysrhythmic, it may be given via ETT
- Pain management of IO

Indications

- Ventricular tachycardia (sustained)
- Ventricular fibrillation
- Pre-intubation in head trauma (RSI only)

Contraindications

- High degree heart blocks
- PVCs in conjunction with bradycardia

Precautions

- Monitor for CNS toxicity
 - Slurred speech
 - Decreased LOC
 - Muscle twitch
- Patients > 70 years of age
- Liver disease
- Congestive heart failure
- Shock

Dosage

- | | |
|-----------------------------|--|
| • Cardiac arrest | 1.5 mg/kg initial bolus, rebolus once 1.5 mg/kg in 3-5 minutes (3 mg/kg max. dose) |
| • PVCs / V-Tach | 1 to 1.5 mg/kg initial bolus, rebolus at 0.5 to 0.75 mg/kg every 5-10 minutes (3 mg/kg maximum dose) |
| • Pre-intubation (RSI only) | 1 mg/kg up to 100 mg maximum dose |
| • Adult EZ-IO insertion | 20-40 mg |
| • Pediatric EZ-IO insertion | .5 mg/kg |

Magnesium Sulfate

A dysrhythmic for wide-complex tachycardias and ventricular fibrillation, or smooth muscle relaxant for severe breathing difficulty (asthma, COPD) and (pre)eclampsia

Wide-Complex Tachycardia, Ventricular Fibrillation, OB/GYN Pregnancy – Pre-Eclampsia

1 g/2 mL vial × 4 (Drug Box)

- Second-line dysrhythmic
- Drug of choice for Torsadés de Pointes
- Contraindicated in heart blocks
- Exercise caution in renal failure patients as drug is eliminated exclusively by kidneys

Indications

- Refractory ventricular fibrillation or ventricular tachycardia
- Torsades de pointes; polymorphic ventricular tachycardia
- Severe pre-eclampsia, eclampsia

Contraindications

- Heart block
- Renal disease
- Shock

Precautions

- Monitor EKG and respiratory status closely
- May cause Altered Mental Status and respiratory depression
- Loss of deep tendon reflexes in the eclamptic patient may indicate over administration
- Use with caution in patients receiving digitalis
- May cause hypotension

Dosage

- | | |
|--------------------------------------|---|
| • Adult cardiac arrest | 2 grams in 10 ml NS given over 5 minutes |
| • Pre-eclampsia | 2 grams in 100 ml NS given over 5 minutes |
| • Eclampsia | 2 grams in 100 ml NS given at 1 gram/minute |
| • Pediatric Ventricular Fibrillation | 20-50 mg in 10 ml NS IVP |
| • Pediatric breathing difficulty | 50 mg/kg, maximum dose 2 grams in 250 ml NS over 20 minutes |

Morphine

A opioid analgesic for pain management and a weak vasodilator to reduce pre-load

Chest Pain/AMI/ACS, Pain Management, Burns, Breathing Difficulty

10 mg/1 mL Carpuject or vial × 2 (Drug Box)

- Morphine is an opioid receptor agonist, and causes profound analgesia and sedation
- May cause respiratory depression
- Must be administered slow IV push to avoid inducing apnea
- Narcan may be administered to reverse overdose
- May be administered concurrently with nitroglycerin to patients with chest pain if pain is unresolved
- May administer additional morphine if needed with physician order
- May cause nausea; implement Nausea/Vomiting protocol as necessary

Indications

- Cardiac chest pain refractory to nitroglycerin
- Severe pain
- Pulmonary edema

Contraindications

- Head injury
- Depressed respiratory drive
- Hypotensive patient
- Asthma
- Undiagnosed abdominal pain
- Patients with known history of hypersensitivity to the drug

Precautions

- Respiratory depression (narcan should be available)
- Hypotension
- Nausea / vomiting
- Bradycardia

Dosage

- Adult dosage 2 mg IV, repeated as necessary with a maximum dosage of 10 mg
- Pediatric dosage 0.1 to 0.2 mg/kg IV, maximum dose 5 mg, may repeat once in 10 minutes

Narcan (Naloxone)

An opioid receptor blockade for potential or suspected opioid overdose

Toxicological Emergencies (Overdose),

2 mg/2 mL prefilled syringe or vial × 4 (Drug Box)

- Narcan works by preferentially binding to opioid receptors in the CNS
- Extremely high receptor affinity, can also displace existing bound opioids to reduce their effect, specifically apnea and/or respiratory depression
- Can precipitate seizures in patients with a seizure history or in long term narcotic addicts
- Can precipitate dysrhythmias in patients with cardiac disease, including ventricular fibrillation or ventricular tachycardia
- Goal of Narcan administration is to establish an adequate respiratory rate, not to return the patient to full consciousness
 - titrate to effect
- Administer before attempting intubation in the patient with suspected opiate overdose

Indications

- Narcotic overdoses including
 - Morphine
 - Demerol
 - Heroin
 - Dilaudid
 - Paregoric
 - Fentanyl
 - Methadone
 - Oxycodone
- Synthetic analgesic overdoses including
 - Nubain
 - Talwin
 - Stadol
 - Darvon

Contraindications

- Patients with known hypersensitivity to the drug

Precautions

- Should be administered with caution to patients addicted to narcotics, as it may cause withdrawal effects
- Short duration of effect

Dosage

- Adult dosage 2 mg, up to a total dose of 8 mg (larger doses may be required for Darvon overdose)
- Pediatric dosage 0.1 mg/kg (maximum dose 2 mg)

Nitroglycerin SL tablets

A potent vasodilator for decreasing oxygen demand in chest pain, and fluid shifting in CHF

Chest Pain, AMI, ACS, Breathing Difficulty (CHF)

0.4 mg tablets - 25 tablet vials x2 (1 Drug Box and 1 IV Box)

- Nitroglycerin works principally in chest pain to reduce total peripheral vascular resistance by vasodilation of the coronary vessels, and thus decrease the oxygen demand placed on an ischemic heart. The reduced demand presumably leads to reduced tissue infarct and better post-event outcome
- Do not administer if the patient has taken sexually enhancing medications (e.g., Viagra, Levitra, Cialis, Stiff Nights, RockHard Weekend) within the past 72 hours because it may cause an unsafe and fatal drop in blood pressure
- SL tablets are ineffectual if swallowed. In such an event, administer another tablet
- Do not administer if the patient has non-cardiac related pulmonary edema
- It is acceptable to briefly remove the CPAP mask to administer nitroglycerin
- EMT-B may administer with physician order and agency OMD approval

Indications

- Angina Pectoris
- Chest pain of suspected cardiac origin
- Pulmonary edema
- Congestive heart failure

Contraindications

- Children <14
- Hypotension
- hypersensitivity

Precautions

- Frequently monitor blood pressure
- Syncope
- Drug must be protected from light
- Expires quickly once bottle is open
- Recent use of Viagra or other erectile dysfunction drugs within past 72 hours

Dosage

- Adult dosage 1- 0.4 mg tablet SL, repeated every 3 to 5 minutes with a maximum of 3 tablets via standing order; you may contact medical control for additional doses

Nitroglycerin TD paste

A potent vasodilator for decreasing oxygen demand in chest pain

Chest Pain, AMI, ACS, Breathing Difficulty (CHF)

1 gram unit dose x 1 (Drug Box)

- A new medication to the TEMS drug box, transdermal nitroglycerin is an alternative to SL tablets; it is, however, much slower onset but indicated if patients cannot tolerate tablets or if tablets are unable to relieve chest pain within 15 minutes
- Nitroglycerin works principally in chest pain to reduce total peripheral vascular resistance by vasodilation of the coronary vessels, and thus decrease the oxygen demand placed on an ischemic heart. The reduced demand presumably leads to reduced tissue infarct and better post-event outcome
- Do not administer if the patient has taken sexually enhancing medications (e.g., Viagra, Levitra, Cialis, Stiff Nights, RockHard Weekend) within the past 72 hours because it may cause an unsafe and fatal drop in blood pressure
- Do not administer if the patient has non-cardiac related pulmonary edema
- It is acceptable to briefly remove the CPAP mask to administer nitroglycerin
- If using CPAP in breathing difficulty, use in conjunction and concurrently with SL tablets if appropriate

Indications

- Angina Pectoris
- Chest pain of suspected cardiac origin in patients receiving CPAP therapy
- Persistent chest pain associated with MI

Contraindications

- Children less than 14 years of age
- hypotension

Precautions

- Frequently monitor chest pains
- Syncope
- Drug must be protected from light
- Always wear gloves when handling nitro paste

Dosage

- 1 inch applied transdermally, cover with a biocclusive dressing

Sodium Bicarbonate

An ionic agent for late cardiac arrest and Crush Syndrome to help reverse acidosis.

Wide-Complex Tachycardia, Ventricular Fibrillation, PEA, Asystole, Crush, Renal Failure

50 mEq/50 mL prefilled syringe × 2 (Drug Box)

- Flush lines and administration site when used in conjunction with Calcium Chloride
- Flush IV line thoroughly when administered in same IV line as Amiodarone
- Must ensure adequacy of ventilation/respiration when used in cardiac arrest

Indications

- Severe acidosis
- Cardiac arrest (asystole, PEA)
- Tricyclic antidepressant overdose
- Crush syndrome
- Cardiac arrest in renal dialysis patient

Contraindications

- Alkalotic states

Precautions

- Can deactivate catecholamines
- Can precipitate with calcium
- Delivers a large sodium load

Dosage

- | | |
|------------------|---|
| • Adult | 1 mEq/kg initially, repeat at ½ mEq/kg every 10 minutes until blood gas studies are available |
| • Crush injuries | add 1 mEq up to 50 mEq to 0.9% saline fluid bolus to first liter only. If patient becomes unstable then give additional 1 mEq/kg IV push up to 50 mEq |
| • Pediatric dose | 1 mEq initially with repeat of ½ mEq/kg every 10 minutes |

Solu-Medrol (methylprednisolone, prednisolone)

A corticosteroid for inflammation in breathing difficulty

Allergic Reaction, Breathing Difficulty

125 mg/2 mL (succinate and 2 mL diluent) vial × 1 (Drug Box)

- Solu-Medrol is a potent anti-inflammatory steroid used to reduce inflammation in Allergic Reactions and breathing difficulty due to asthma or COPD
- Solu-medrol onset of action is 1-2 hours after administration so it does not replace faster acting drugs such as albuterol, Atrovent and/or epinephrine
- Must be reconstituted prior to administration
- Solu-medrol should not be routinely administered to pediatric patients; however, it may be considered for extended transports (physician order only)

Indications

- Severe anaphylactic reaction in patients who are hemodynamically unstable or in respiratory distress
- Severe asthma / COPD

Contraindications

- Patients with a known hypersensitivity to glucocorticoids

Precautions

- Pregnant women

Dosage

- | | |
|--------------------|--|
| • Asthma / COPD | 125 mg slow IV over 2 to 3 minutes |
| • Anaphylaxis | 125 mg slow IV over 2 to 3 minutes |
| • Pediatric dosage | <u>Should not be routinely administered to pediatric patients; however it may be considered for extended transports (physician order only)</u> - 2 mg/kg up to 125 mg |

Valium (Diazepam)

A benzodiazepine used to treat seizures, provide sedation and to treat cocaine induced SVT

Seizures, Chemical Exposure, Narrow-Complex Tachycardia, Wide-Complex Tachycardia, RSI, Airway/Oxygenation/Ventilation

10 mg/2 mL Carpuject or vial × 2 (Drug Box)

- Alternative drug for seizures
- Consider request for order in known or highly suspected cocaine-induced SVT
- Up to slow IV push (over 2 minutes) titrate to desired effect; fast IV push may result in apnea
- May be administered IM if IV/IO access is not available
- Reduce dose by 50% in elderly patients (aged 65 or older)
- Risk for respiratory depression and bradycardia, and should be administered with ECG and SpO₂ monitoring
- Flush IV lines thoroughly after Valium administration; Valium is incompatible with most drugs and precipitation is likely to occur
- Use Valium for rectal administration

Indications

- Seizures
- Status epilepticus
- Premedication prior to cardioversion
- Acute anxiety states
- Transcutaneous pacing

Contraindications

- Patients with known hypersensitivity to the drug
- Pregnancy

Precautions

- Can cause local venous irritation
- Has short duration of effect

Dosage

- | | |
|--|---|
| • Status epilepticus | 2-5 mg IVP |
| • Combative patient | 5 mg IM |
| • Premedication prior to cardioversion | 2-5 mg IV |
| • Pediatric dosage status epilepticus | 0.1-0.3 mg/kg not to exceed 5 mg IVP
Rectal dose 0.4 mg/kg |

Versed (Midazolam)

A benzodiazepine used to treat and provide sedation

Seizures, Chemical Exposure, Narrow-Complex Tachycardia, Wide-Complex Tachycardia, RSI, Airway/Oxygenation/Ventilation

2 mg/2 mL vial × 5 (Drug Box)

- Alternative drug for seizures
- Dose slow IV push (over 1 minute); fast IV push may result in apnea
- May be administered IM if IV/IO access is not available
- Risk for respiratory depression and bradycardia, and should be administered with ECG and SpO₂ monitoring

Indications

- Pre and post-intubation sedation
- Combative patient
- Premedication prior to cardioversion
- Sedation for pacing
- Seizures

Contraindications

- Shock
- Coma
- Acute alcohol intoxication with depression of vitals
- Patients with a known hypersensitivity to the drug

Precautions

- Respiratory depression is more common with versed than other benzodiazepines
- COPD patients are usually sensitive to the respiratory depressant effect
- Does not protect against increase in ICP, heart rate or blood pressure associated with intubation
- Adverse reactions may increase when used with
 - Barbituates
 - Alcohol
 - CNS depressants
 - Cimetidine (Tagamet)
 - Ranitidine (Zantac)
 - Diltiazem (Cardizem)
- All patients receiving versed must also receive continuous monitoring for
 - Early signs of hypoventilation
 - Airway obstruction
 - Apnea

Dosage

- | | |
|------------------------------------|---------------------------------|
| • Status epilepticus | 2-5 mg IVP (maximum dose 10 mg) |
| • Pre-medication for cardioversion | 1-2 mg IVP (maximum dose 10 mg) |
| • Post intubation sedation | 2 mg IVP(maximum dose 10 mg) |
| • Pediatric dosage | 0.1 mg (maximum dose 2 mg) |

Zofran (Ondansetron)

A serotonin antagonist antiemetic for nausea and vomiting

Nausea/Vomiting

4 mg vial × 2 (Drug Box)

- A new medication to the TEMS box, it may be administered prophylactically when vomiting could produce an airway obstruction (for example, in back boarded patients) or for patient comfort when the patient is repeatedly vomiting
- Has little effect on motion sickness-related illness
- Administer slow IV push (over 2-5 minutes)
- Repeated doses generally are not effective; however, if the patient is still vomiting 20 minutes after the first dose, a repeat dose may be given
- Use caution in conjunction with Amiodarone and Haldol as prolonged Q-T intervals may increase risk of dysrhythmias
- May be administered IM if IV is not available

Indications

- Treatment of profound nausea, active vomiting or profound vertigo with vomiting

Contraindications

- Known hypersensitivity to the drug

Precautions

- Pediatric patients less than one year of age
- Liver disease

Dosage

- Adult dosage 4 mg over 2-5 minutes, may repeat dose in 20 minutes if needed
- Pediatric dosage 0.15 mg/kg up to total dose of 4 mg slow IV push (over 2-5 minutes) or IM if IV is not available, may be repeated at same dose in 20 minutes