

# **PHARMACOLOGY**

**Updated: 1-01-10**

## PHARMACOLOGY

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# **PHARMACOLOGY**

## **Introduction**

The drugs listed in this section are for quick reference only. They are listed alphabetically by the generic drug name and include the indications, contraindications, side effects and dosage recommended in pre-hospital use. Medical control may at any time elect to order or deny use of these drugs or defer from these suggested drug guidelines. The responsibility for the use of drugs ordered by medical control will lie on the physician on duty granting the drug order.

When receiving orders to administer drugs from medical control, the drug name and dosage amount and administration route should be repeated to the physician granting the order to confirm correct amount. The time of administration, amount of drug administered and route and drug name should be documented along with physician granting order and effects to patient after administration.

## PHARMACOLOGY

### **Adenosine (Adenocard)**

- Slows AV conduction
- Terminates PSVT

### **Indications**

- PSVT (ACLS-10; Peds-33, 34)

### **Contraindications**

- Second or third degree heart block
- Allergy to Adenosine
- Sick Sinus Syndrome

### **Side effects**

- Transient dysrhythmias
- Bradycardia
- Chest pressure
- Hypotension
- Dyspnea, bronchospasm
- Facial flushing, headache
- Nausea

### **Dosage**

- **Adults:** 6mg rapid IVP followed by immediate saline flush  
Repeat at 12mg if unsuccessful
- **Children:** 0.05-0.2mg/kg IVP up to 6mg followed by saline flush  
May be repeated if unsuccessful

## PHARMACOLOGY

### **Albuterol (Proventil, Ventolin)**

- Sympathetic agonist ( $\beta_2$  selective)
- Bronchodilation
- Increases HR

### **Indications**

- Asthma (Resp-7; Peds-10, 27)
- COPD

### **Contraindications**

- Acute myocardial infarction
- Arrhythmias
- Caution with cardiovascular disease
- Caution with congestive heart failure
- Caution with hypertension history
- Allergy to Albuterol

### **Side effects**

- Palpitations
- Anxiety
- Nausea
- Dizziness

### **Dosage**

- 2.5mg in 3cc NS inhaled. May be repeated in 15 minutes
- Continuous administration in severe asthma / COPD

## PHARMACOLOGY

### **Amiodarone (Cordarone)**

- Prolongs action potential and refractory period in ALL cardiac tissues
- Slows the sinus rate
- Decreases SVR

### **Indications**

- VF/pulseless VT (ACLS-13)
- Polymorphic VT and wide complex tachycardia (ACLS-5, 9)
- Adjunct to electrical cardioversion of SVT, PSVT (ACLS-10; Peds-34)

### **Contraindications**

- Second or third degree heart block
- Medication-induced ventricular dysrhythmias
- Hypotension
- Bradycardia

### **Side effects**

- Hypotension
- Bradycardia
- PEA
- CHF
- ARDS
- Nausea
- Fever

### **Dosage**

- **Ectopy:** 150mg / 100cc NS over 10 minutes
- **Cardiac Arrest:** 300mg IVP. Consider additional 150mg IVP in 3-5 minutes
  
- **Wide complex tachycardia:** 150mg / 100cc NS over 10 minutes
- **SVT:** 150mg / 100cc NS over 10 minutes
  
- **Pediatric Cardiac Arrest:** 5mg/kg IVP
- **Pediatric SVT:** 5mg/kg drip over 20 minutes

## PHARMACOLOGY

### **Aspirin (ASA)**

- Blocks platelet aggregation
- Anti-inflammatory

### **Indications**

- Chest pain in suspected MI (ACLS-3; t-PA-3; r-PA-3)
- STEMI (ACLS-4)

### **Contraindications**

- Pregnancy
- Ulcers
- Pediatric patients
- Known hypersensitivity

### **Side effects**

- None

### **Dosage**

- 325mg PO adult tablet
- 81mg chewable baby (4 tablets)

## PHARMACOLOGY

### **Atropine sulfate (Atropisol, Isopto Atropine)**

- Parasympatholytic
- Positive chronotrope (SA node)

### **Indications**

- Asystole (ACLS-7)
- Symptomatic bradycardia (ACLS-5; Peds-14)
- Organophosphate poisoning (Poison-3)
- PEA (if bradycardic) (ACLS-12)
- Bradycardia (ACLS-62)

### **Contraindications**

- Atrial fibrillation or Atrial flutter
- Tachycardia
- 2° Type II or 3° AV block with wide QRS complexes
- Glaucoma
- Allergy to Atropine

### **Side effects**

- Tachycardia
- VF or VT
- Headache, dry mouth and flushed skin
- Confusion
- Dilated pupils

### **Dosage**

- Asystole:
  - Adults:** 1mg IVP, repeat after 5 minutes
  - Maximum dose: 3mg total**
  - Children:** 0.02mg/kg IVP (min dose 0.1mg). Repeat every 5 minutes
  - Maximum dose: 0.03 - 0.04mg/kg**
- Bradycardia:
  - Adults:** 0.5mg IVP repeated every 5 minutes.
  - Maximum dose: 3mg total**
  - Children:** 0.02mg/kg IVP (min dose 0.1mg). Repeat every 5 minutes
  - Maximum dose: 0.03 - 0.04mg/kg**
- Organophosphate Poisoning:
  - Adults:** 2-5mg IVP or IO every 5 minutes
  - Children:** 0.05mg/kg IVP or IO every 5 minutes
  - No maximum dose**

## PHARMACOLOGY

### **BiCarbonate (Sodium BiCarbonate)**

- Buffers metabolic acidosis
- Enhances the urinary excretion of tricyclics

### **Indications**

- Metabolic Acidosis from cardiac arrest (ACLS-7, 12)  
(10 minute down time)
- Tricyclic overdose
- Hyperkalemia

### **Contraindications**

- Heart failure
- Seizures

### **Side effects**

- Tissue Necrosis if infiltration
- Can precipitate with Calcium

### **Dosage**

- 50mEq IVP for tricyclic overdoses
- 50mEq or 1mEq/kg IVP for cardiac arrest-asystole-PEA
- 50mEq IVP for cardiac arrest with a prolonged down time (10 minutes)

## PHARMACOLOGY

### **Calcium Chloride 10%**

- Increases cardiac contractility

### **Indications**

- Calcium channel blocker overdose (ACLS-6, 7, 12)
- Beta blocker overdose (Poison-6)
- Hyperkalemia
- Know dialysis patients in cardiac arrest

### **Contraindications**

- Hypercalcemia
- VF
- Caution with chronic renal failure
- Digoxin toxicity / overdose
- Can precipitate with BiCarbonate

### **Side effects**

- Do not mix with Bicarbonate (flush the line)
- Tissue necrosis if infiltration
- Arrhythmias

### **Dosage**

- **Adults:** 1gram (10cc) Slow IVP

## PHARMACOLOGY

### **Dextrose 50%**

- Increases blood sugar levels
- Short acting osmotic diuretic

### **Indications**

- Hypoglycemia (AMS-3; Peds-18, 29, 31)
- Altered mental status of unknown origin (Vascular Support-2; AMS-9 Peds-8)
- Coma of unknown origin (AMS-2)
- Seizures of unknown origin (AMS-7)

### **Contraindications**

- Head trauma – unless confirmed hypoglycemia
- Intracranial hemorrhage – unless confirmed hypoglycemia
- Caution with chronic renal failure

### **Side effects**

- Neurologic syndrome in patients with renal failure
- Tissue necrosis if infiltration

### **Dosage**

- **Adults:** 25grams IVP
- **Children:** 2cc/kg D<sub>25</sub> (0.5 gram/kg) IVP. Dilute D<sub>50</sub> 1:1 with NS (0.25 gram/cc)
- **Neonate:** 5cc/kg D<sub>10</sub> (0.5 gram/kg) IVP. Dilute D<sub>50</sub> 4:1 with NS (0.1 gram/cc)
- Some patients may require second dose if severe hypoglycemia

## PHARMACOLOGY

### **Diazepam (Valium)**

- Anticonvulsant
- Sedative
- Skeletal muscle relaxant

### **Indications**

- Status epilepticus (AMS-6; OB-5; Peds-31)
- Combative patient (Trauma-10)
- Sedation prior to cardioversion
- Sedation to facilitate immediate intubation

### **Contraindications**

- Hypotension
- Respiratory depression – unless as adjunct to intubation
- Altered mental status—except for control of agitation (order required)
- Pregnancy – unless for seizure control
- Sedative intoxication (relative; effects can be additive)
- Allergy to Valium

### **Side effects**

- Respiratory depression
- Hypotension
- Drowsiness
- Venous irritation

### **Dosage**

- Status Epilepticus  
**Adults:** 5mg SLOW IV/IO/IM PUSH  
**Children:** 0.1-0.2 mg/kg SLOW IV/IO/IM PUSH. May be given 0.5mg/kg rectal
- Sedation Prior to Cardioversion  
**Adults:** 5-10mg SLOW IV/IO/IM  
**Children:** 0.1-0.2 mg/kg SLOW IV/IO/IM or 0.5mg/kg rectal
- **In elderly patients:** 2mg SLOW IV/IO/IM repeat in 5 minutes if needed

**\*\*BE PREPARED TO VENTILATE PATIENT\*\***

**\*\*Consult Medical Direction with any questions\*\***

## PHARMACOLOGY

### **Diphenhydramine (Benadryl)**

- Antihistamine
- Sedative

### **Indications**

- Anaphylactic or allergic reactions (Resp-8; Peds-10)
- Anaphylactic shock
- Nausea/vomiting (contact Medical Control) (Nausea/vomit-2)
- Acute dystonia

### **Contraindications**

- Allergy to Benadryl
- Pregnant or lactating females

### **Side effects**

- Sedation
- Hypotension
- Blurred vision
- Wheezes
- Dizziness

### **Dosage**

- **Adults:** 12.5 - 25 mg IVP or deep IM
- **Children:** 1mg/kg slow IVP or IM to max of 25mg

# PHARMACOLOGY

## Dopamine (Intropine)

- Sympathetic agonist ( $\beta_1$ , dose dependent on alpha receptors)

## Indications

- Cardiogenic shock (ACLS-14; Vascular Support-3)
- Distributive shock
- Cyanide poisoning (contact Medical control) (Poison-8)

## Contraindications

- VF or VT
- Hypovolemic hypotension
- Do not mix with Bicarbonate
- Allergy to Dopamine

## Side effects

- Ectopic beats
- Palpitations
- Tachycardia
- Angina
- VF or VT
- Hypertension
- Headache, N/V
- Dyspnea
- Tissue necrosis if infiltration

## Dosage

- Infuse at 5-20mcg/kg/min IV DRIP. Titrate to effect (SBP > 90)
- Decrease dosage if patient becomes markedly tachycardic or develops VT

Simple calculation for approx 5 mcg/kg/min (must be 1600 mcg/ml concentration)

\*Take the Patients weight in lbs and remove the last digit (175lbs = 17)

\* Subtract 2 from that figure (17-2=15)

\*This gives you the number of drops per min using a 60gtts set. (titrate to desired effect)

Example: 175lbs patient.

175 remove the 5 is 17

17 - 2 = **15 drops per min** (approx 5 mcg/kg/min)

## PHARMACOLOGY

### **DuoNeb**

#### **(Ipratropium)**

- Parasympatholytic bronchodilator
- Dries respiratory tract secretions

#### **(Albuterol)**

- $\beta_2$  selective bronchodilator
- Increases HR

### **Indications**

- Asthma exacerbation (Resp-7)
- COPD exacerbation (Resp-6)
- Patients requiring more than one bronchodilator (breathing treatment)
- Patients that have used their prescribed inhaler more than twice
- Pulmonary edema with wheezing (Resp-3)

### **Contraindications**

- Acute myocardial infarction
- Arrhythmias
- Caution with cardiovascular disease
- Caution with HTN history
- Caution with CHF
- Allergy to Albuterol
- Allergy to peanuts

### **Side effects**

- Palpitations
- Anxiety
- Nausea
- Dizziness

### **Dosage**

- Unit dose inhaled. May be repeated
- Continuous administration in severe asthma/COPD

## PHARMACOLOGY

### **Epinephrine (Adrenaline)**

- Increases HR & SVR
- Increases cardiac contractility
- Bronchodilator

### **Indications**

- Acute asthma (Resp-7; Peds-27)
- Anaphylactic reactions (Resp-8, 9; Peds-10)
- Cardiac arrest (ACLS-7, 12, 13; Peds-16)
- Pediatric bradycardia (Peds-14)

### **Contraindications**

- Tachycardia
- Hypertension
- Hyperthyroidism
- Angina / Chest pain
- Coronary artery disease
- Caution in pregnancy

### **Side effects**

- Tachycardia
- Hypertension
- VF and VT
- Angina

### **Dosage**

- Asthma and mild Anaphylaxis:
  - Adults 16-50 yr.:** (1:1,000) 0.3-0.5mg SQ
  - Children 10-16 yr.:** (1:1,000) 0.3mg SQ
  - Children under 10 yr.:** (1:1,000) 0.01mg/kg SQ
- Severe Anaphylaxis:
  - Adults:** (1:10,000) 0.1-0.5 mg IVP or IO over 5 minutes
  - Children 10-16 yr.:** (1:10,000) 0.01mg/kg IVP or IO over 5 minutes
  - NOTE: Administer SQ dose prior to contacting Medical Direction. IV dose in non-cardiac patient consult Medical Direction**
- Cardiac Arrest:
  - Adults:** (1:10,000) 1mg IVP or IO every 5 minutes
  - Children:** (1:10,000) 0.01mg/kg IVP

## PHARMACOLOGY

### **Furosemide (Lasix)**

- Diuretic
- Decreases preload
- Venodilator

### **Indications**

- Pulmonary edema (Resp-3)
- Congestive heart failure

### **Contraindications**

- Renal failure on dialysis
- Pregnancy
- Hypokalemia
- Dehydration
- Pneumonia
- Allergy to Lasix

### **Side effects**

- Dehydration
- Hypokalemia
- Hypotension

### **Dosage**

- **Adults:** 0.5-1.0mg/kg SLOW IVP or double the daily oral dose. 100mg max dose
- **Children:** 1mg/kg slow IVP

## PHARMACOLOGY

### **Glucagon**

- Causes breakdown of glycogen to glucose
- Increases cardiac contractility

### **Indications**

- Hypoglycemia (when IV access is not available) (AMS-3; Peds-18)
- Beta-blocker overdose 2-4mg IVP (Poison-6; ACLS-6)
- Calcium channel overdose 2-4mg IVP
- Esophageal foreign body obstruction 1-2mg IV/IM

### **Contraindications**

- Hypersensitivity to Glucagon
- Pheochromocytoma

### **Side effects**

- Nausea / vomiting

### **Dosage**

- **Adults:** 1mg IM for hypoglycemia  
2-4mg IVP for hypotension / bradycardia in overdoses listed above
- **Children < 20 kg:** 0.5mg IM
- **Children > 20 kg:** 1mg IM

NOTE: Glucagon is **NOT** a substitute for D50, D25, or D12.5. IV must be attempted prior to administering Glucagon

## PHARMACOLOGY

### **Haldol (Haloperidol)**

- Antipsychotic
- Major tranquilizer

### **Indications**

- Combative patient (Trauma-10; Poison-5)
- Acute psychotic episodes

### **Contraindications**

- Head injury or head trauma
- Seizure or history of seizures
- Children less than 16 years old
- Known hypersensitivity

### **Side effects**

- Altered LOC / Coma
- Respiratory Depression
- Hypotension
- Tremors
- Dystonia (rare)

### **Dosage**

- **Not recommended for Pediatrics**
- 5mg IM / IV / IO

**Call Medical Direction for orders of repeat single dose after 5 minutes**

**The patient MUST be routinely monitored for respiratory depression**

**The patient MUST be routinely monitored for hypotension**

**The run documentation MUST clearly support the use of this medication**

## PHARMACOLOGY

### **Heparin**

- Anticoagulant

### **Indications**

- Acute Coronary Syndrome (t-PA-3; r-PA-3)
- LVAD malfunction

### **Contraindications**

- Hypersensitivity to Heparin
- Active bleeding
- Trauma
- Severe hypertension
- Aortic dissection
- Pregnancy
- Major surgery within 14 days
- Symptoms of CVA

### **Side effects**

- Bleeding

### **Dosage**

- **Adults:** 50 units/kg
- Maximum adult dose (4000 unit bolus)

**Consult Medical Direction prior to administration**

## PHARMACOLOGY

### **Lidocaine (Xylocaine)**

- Suppresses ventricular ectopy

### **Indications**

- Freon poisoning
- Reduces ICP for intubation in head injury
- IO anesthetic

(Vascular Support-15 /EZ IO-6)

### **Contraindications**

- Allergy to Lidocaine
- Second or third degree heart blocks
- Bradycardia
- Hypotension
- Sinus arrest

### **Side effects**

- Bradycardia
- Hypotension
- Seizures
- Altered mental status

### **Dosage**

- 1.5 mg/kg IVP
- Repeat .75 mg/kg IVP every 5 minutes Max 3 mg/kg
- EZ IO dose:
  - 20mg IO
- Intubation with suspected increased ICP: 1mg/kg SLOW IVP prior to intubation

## PHARMACOLOGY

### **Lopressor (Metoprolol)**

- Beta blocker
- Decreases HR
- Decreases systolic BP

### **Indications**

- Chest Pain with BP >110 systolic (ACLS-3, 4)
- AMI to reduce myocardial ischemia
- Convert or slow ventricular response in SVT (adenosine preferred)

### **Contraindications**

- Bronchial asthma
- CHF
- Second or third degree heart block
- Bradycardia (HR less than 60)
- Cardiogenic shock
- Cocaine use

### **Side Effects**

- Bradycardia
- Heart block
- CHF
- Bronchospasm
- Hypotension

### **Dosage**

- 5mg IVP over 1 minute. May repeat 5mg if inadequate response (consult Medical Direction)

## PHARMACOLOGY

### **Magnesium Sulfate**

- Anticonvulsant
- Antiarrhythmic
- CNS depressant

### **Indications**

- Seizures secondary to eclampsia (OB-5)
- Ventricular ectopy refractory to Amiodarone
- VF refractory to meds and defibrillation
- Torsades (ACLS-9)
- Adjunct to alleviate acute asthma attacks (RESP-7)

### **Contraindications**

- Renal disease
- Heart blocks

### **Side effects**

- Respiratory depression
- CNS depression
- Hypotension
- Cardiac arrest

### **Dosage**

- 1.0-4.0 grams SLOW IVP over 2-3 minutes (Max dose 4 grams)
- Asthma dose 45mg/kg to a total of 75mg/kg max

Approx Mag Dose	
Child < 10	1 gram
Child 10 - 16	1 to 2 grams
Adult	3 to 4 grams

## PHARMACOLOGY

### **Methylprednisolone (Solumedrol)**

- Anti-inflammatory steroid

### **Indications**

- Anaphylaxis (Resp-8, 9; Peds-10)
- Asthma (Resp-7)
- COPD (Resp-6)

### **Contraindications**

- None in emergency setting

### **Side effects**

- GI Bleeding
- Prolonged wound healing
- Suppression of natural steroids

### **Dosage**

- **Adults:** 125 mg IVP
- **Pediatric:** 1-2 mg/kg IVP

## PHARMACOLOGY

### **Morphine Sulfate**

- Narcotic analgesic
- Causes peripheral vasodilation

### **Indications**

- Pulmonary edema (Resp-3)
- Myocardial infarction pain unrelieved with nitro (ACLS-3)
- Pain secondary to burns
- Musculoskeletal pain (Trauma-15)
- STEMI (ACLS-4)

### **Contraindications**

- Altered mental status
- Respiratory depression
- Hypotension
- Head trauma
- COPD
- Bradycardia
- Acute ABD pain (consult Medical Direction)
- Allergy to Morphine

### **Side effects**

- Respiratory depression
- Hypotension
- Bradycardia
- Drowsiness
- Nausea

### **Dosage**

- **Adults:** 2 to 4 mg Slow IVP, IO, or Intranasal (if no relief, may repeat at 2 to 4 mg). **For further doses over 10 mg of Morphine, contact medical direction.** (Hold if pulse <60, SBP<100)  
May be used IV/IO/IM
- **Children:** 0.1-0.2mg/kg SLOW IVP or IM/SQ

NOTE: Standing orders for Pulmonary Edema, MI and burns  
Attempt to consult Medical Direction for ABD pain

## PHARMACOLOGY

### **Naloxone (Narcan)**

- Narcotic antagonist

### **Indications**

- Narcotic overdoses (ACLS-7, 12; Vascular support-3; Poison-4, Trauma-5)
- Coma of unknown origin (AMS-2, 9; Peds-8, 36)

### **Contraindications**

- None

### **Side effects**

- Withdrawal syndrome in addiction
- Ventricular dysrhythmias
- Cerebral edema

### **Dosage**

- **Adults:** 0.4-2mg IV/IO, IM, SQ or intranasal. Administer in small doses
- May repeat the initial dose if the patient becomes symptomatic again
- **Children:** 0.1mg/kg IV/IO, IM, SQ or intranasal. Repeat at 0.1mg/kg

## PHARMACOLOGY

### **Nitroglycerin (Nitro Stat)**

- Decreases preload and afterload
- Increases coronary blood flow

### **Indications**

- Angina (ACLS-3; t-PA-3; r-PA-3)
- Pulmonary edema (Resp-3)
- STEMI (ACLS-4)

### **Contraindications**

- Hypotension (systolic BP <110, diastolic BP < 60)
- Glaucoma
- Increasing intra-cranial pressure
- CVA
- Erectile dysfunction drugs

### **Side effects**

- Hypotension
- Dilated pupils
- Headache
- Syncope

### **Dosage**

- Tablet: 0.3-0.4mg SL may be repeated in 3-5 min x 3
- Spray: 0.4mg spray aerosol repeated in 3-5 minutes x 3
- Pulmonary edema with **systolic BP >200**: 0.9-1.2mg SL (**3 tablets** simultaneously)

## PHARMACOLOGY

### **Nitrous Oxide**

- Analgesic

### **Indications**

- Fractures.
- Chest pain
- Burns - excluding those involving the airway
- Dislocations

### **Contraindications**

- Patients under 12 years of age
- Severe COPD
- Head injury
- ABD pain or trauma
- Intoxication or drug ingestion
- Shortness of breath
- Chest trauma with a possible pneumothorax (during prolonged transport)

### **Discontinue if any of the following arise**

- Nausea
- Deteriorating vital signs (administer 100% oxygen)
- The patient is unable to self-administer the agent

### **Procedure**

1. Patient MUST be able to self-administer
2. Explain procedure to the patient giving them psychological support
3. Obtain baseline vitals and place on monitor. Include times with documentation
4. Initiate treatment reminding the patients to administer the treatment themselves. Encourage them to **BREATHE NORMALLY**; there is a tendency to over breathe
5. Explain that there should be some relief noted within one or two minutes
6. Continue to support patient and re-evaluate their vital signs. Watch closely for any change in the patient condition
7. Contact Medical Control
8. Repeat vital signs frequently and document all findings

## PHARMACOLOGY

### **Ondansetron (Zofran)**

- Antiemetic

### **Indications**

- Nausea / vomiting (Nausea/Vomiting-2)

### **Contraindications**

- Hypersensitivity

### **Side effects**

- Headache
- Dizziness

### **Dosage**

- **Adult:** 4mg SLOW IVP
- **Children:** 0.1 mg/kg SLOW IVP

## PHARMACOLOGY

### **r-PA (Reactivase, Retavase)**

- Reactivase is a tissue plasminogen activator enzyme produced by recombinant DNA technology. It has ability to convert plasminogen to plasmin. This process initiates local fibrinolysis. It is 80% cleared from the body after 10 minutes.

### **Indications**

- Used in the management of Acute Myocardial Infarction for lysis (dissolving) of thrombi (clots) obstructing coronary arteries
- Used for lysis (dissolving) of massive pulmonary emboli (clots in the lungs).

### **Contraindications**

- Active internal bleeding
- History of CVA
- Recent (within two months) intracranial or intraspinal surgery or trauma
- Intracranial neoplasm, arteriovenous malformation, or aneurysm
- Known bleeding condition
- Severe uncontrolled hypertension

### **Side effects**

- Various dysrhythmias which may occur as the clot is dissolved within the coronary artery. Treatment with prophylactic Lidocaine is indicated

### **Dosage**

- 10 Units total dose administered IVP (10 unit bolus over 2 minutes)
- 10 Units re-bolus if transport times are greater than 30 minutes IVP

### **WARNINGS**

Bleeding may occur if given when contraindications are present or when unknown conditions exist. Two types of bleeding occur:

INTERNAL involving numerous systems including the brain;

SURFACE which involves bleeding from puncture wounds or recent surgical sites

**Numerous risk factors need to be considered prior to administering r-PA**

**Each patient should be evaluated on a case by case basis**

**Consult Medical Direction**

## PHARMACOLOGY

### **Tetracaine (Pontocaine - Ophthalmic)**

- Topical anesthetic

### **Indications**

- Irritation or pain of the eyes with **NO PENETRATING TRAUMA** (Trauma-5)
- Chemical exposure (facilitates irrigation)

### **Contraindications**

- Penetrating or open eye trauma
- Allergy or hypersensitivity to Tetracaine

### **Side effects**

- Redness
- Burning
- Tearing

### **Dosage**

- 1-2 drops in the affected eye every 5-10 minutes as needed for pain control

## PHARMACOLOGY

### **Thiamine (vitamin B<sub>1</sub>)**

- Allows normal breakdown of glucose

### **Indications**

- Indicated use in adult patients only (AMS-2, 3, 7)
- Altered mental status. Given prior to D50 to avoid Wernicke Korsakoff Syndrome (alcoholics, renal failure patients, or malnourished patients may have a Thiamine deficiency)
- Alcohol abuse

### **Contraindications**

- None

### **Side effects**

- None

### **Dosage**

- **Adults only:** 100 mg IVP prior to administering D50

## PHARMACOLOGY

### **Toradol (Ketorolac)**

- NSAID analgesic

### **Indications**

- Moderate pain (Trauma-15)
  - Pain associated with Kidney and Gall Stones

### **Contraindications**

- Hypersensitivity
- Aspirin allergy
- NSAID allergy
- Advanced renal impairment
- Suspected cerebrovascular bleeding
- Recent GI bleeding
- Nursing mothers
- Labor and delivery
- Asthma

### **Side effects**

- Edema
- Hypertension
- Rash
- Nausea
- Drowsiness
- Dizziness

### **Dosage**

- **Adults:** 30mg IVP or 60 mg IM
- **PEDS:** 0.15 mg/kg IV or 0.3 mg/kg IM

## PHARMACOLOGY

### **t-PA (Activase)**

- t-PA is a tissue plasminogen activator enzyme produced by recombinant DNA technology. It has ability to convert plasminogen to plasmin. This process initiates local fibrinolysis. It is 80% cleared from the body after 10 minutes

### **Indications**

- Used in the management of Acute Myocardial Infarction for lysis (dissolving) of thrombi (clots) obstructing coronary arteries
- Used for lysis (dissolving) of massive pulmonary emboli (clots in the lungs)

### **Contraindications**

- Active internal bleeding
- History of CVA
- Recent (within two months) intracranial or intraspinal surgery or trauma
- Intracranial neoplasm, arteriovenous malformation, or aneurysm
- Known bleeding condition
- Severe uncontrolled hypertension

### **Side effects**

- Various dysrhythmias which may occur as the clot is dissolved within the coronary artery. Treatment with prophylactic Lidocaine is indicated

### **Dosage**

- 15mg total dose administered IVP over 2 minutes
- 35mg drip over 30 minutes if transport times are greater than 30 minutes

### **WARNINGS**

- Bleeding may occur if given when contraindications are present or when unknown conditions exist. Two types of bleeding occur:
  - INTERNAL involving numerous systems including the brain
  - SURFACE which involves bleeding from puncture wounds or recent surgical sites

**Numerous risk factors may need to be considered prior to administering t-PA  
Consult Medical Direction**

## PHARMACOLOGY

### **Vasopressin (Pitressin)**

#### **Indications**

- VF (ACLS-13)
- Asystole (ACLS-7)
- PEA (ACLS-12)

#### **Contraindications**

- None

#### **Side effects**

- None

#### **Dosage**

- 40 units IVP **ONE DOSE ONLY, ONE TIME ONLY**
- Epinephrine 1mg every 3-5 minutes to follow after 10 minutes

## PHARMACOLOGY

### **(Versed) Midazolam**

- Sedative and hypnotic benzodiazepine
- Induces amnesia

### **Indications**

- Conscious sedation (Poison-5; Trauma-10)
- Seizures (AMS-6; Peds-31; OB-5)
- Facilitate intubation (Resp-9)
- Facilitate pacing / cardioversion (ACLS-6, 8-11)

### **Contraindications**

- Intolerance to benzodiazepines
- Narrow-angle glaucoma
- Shock
- Coma

### **Side effects**

- **CNS**-amnesia, headache, dizziness, euphoria, confusion, agitation, anxiety, delirium, drowsiness, muscle tremor, ataxia, dysphoria, slurred speech, and paresthesia
- **Cardiovascular**-hypotension, PVC's, tachycardia, vasovagal episode
- **Eye**-blurred vision, diplopia, nystagmus, pinpoint pupils
- **Gastrointestinal** (low incidence)- N/V, acid taste, retching, excessive salivation
- **Respiratory**-coughing, bronchospasm, laryngospasm, apnea, hypoventilation, wheezing, airway obstruction, tachypnea
- **Skin**-swelling, burning, pain at the site of injection

### **Dosage**

- 2 - 4mg IV/IO/IM. May repeat in 3 minutes if inadequate response
  - 2mg IV/IO/IM max initial dose for sedation (may repeat as necessary)
  - 2mg IV/IO/IM max initial dose for seizures (may repeat as necessary)
  - May be administered nasally
- Versed may be administered IM or nasally whenever IV access is not achieved**

## PHARMACOLOGY

### **Ciprofloxacin (Cipro)**

- Antimicrobial

### **Indications**

- Exposure to Anthrax and other microorganisms as deemed necessary by public health and medical direction

### **Contraindications**

- Hypersensitivity

### **Side effects**

- Nausea / vomiting

### **Dosage**

- **Adult:** 500mg tablet PO
- **Adult:** 400mg IV

## PHARMACOLOGY

### **Doxycycline (Vibramycin)**

- Tetracycline antibiotic

### **Indications**

- Anthrax
- Plague

### **Contraindications**

- Allergy
- Pregnancy
- Pediatrics

### **Side effects**

- None

### **Dosage**

- **Adult:** 100mg tablet PO. Max dose 200mg

## PHARMACOLOGY

### **Hydroxycobalamine (Cyanokit)**

- Reverses cellular hypoxia in cyanide poisoning

### **Indications**

- Known or suspected cyanide poisoning (CyanoKit-2)
- Known or suspected cyanide poisoning (Poison-9)

### **Contraindications**

- None

### **Side effects**

- Hypertension
- Chromaturia
- Erythema
- Nausea
- Headache

### **Dosage**

- **Adults:** 5g IVpg over 5 minutes
- In 5 minutes repeat 5g IVpg over 5 minutes – (Contact medical Direction)

## PHARMACOLOGY

### **MARK I kit (Pralidoxime [2-PAM] / Atropine / Diazepam)**

- Pralidoxime is a cholinesterase reactivator

### **Indications**

- Exposure to nerve agents (Nerve agent-1, 2)
- Organophosphate poisoning (Poison-3)

### **Contraindications**

- None

### **Side effects**

- See attached protocols

### **Dosage**

- **Adults and pediatric patients over age 10 or 40kg**
- 1-2 MARK I kits. May repeat atropine 2mg IM autoinjector every 5-10 minutes until secretions relieved
- Severe symptoms (unconscious/seizures/apnea): May administer 3 MARK I kits
- May repeat atropine 2mg autoinjector every 5-10 minutes until secretions relieved
- May administer diazepam 10mg IM autoinjector or 5-10 mg IV for any seizure activity related to nerve agent exposure
  
- **Pediatric Patients less than age 10 or less than 40 kg**
- Atropine 0.05mg/kg IV or IM. Repeat every 5-10 minutes until respiratory status improves (Max dose: 4mg)
- Pralidoxime (if available) 25-50 mg/kg IV or IM. May repeat every 1 hour (Max dose: 1200mg). Watch for muscle rigidity, laryngospasm, tachycardia
- Diazepam (if any seizure activity present)
  - Age 30 days to 5 years: Diazepam 0.05-0.3mg/kg IV or IM (Max 10mg)
  - Age 5 years and older: Diazepam 0.05-0.3mg/kg IV or IM (Max 30mg)

**Monitor respiratory status closely following administration of diazepam**

## PHARMACOLOGY

### **Fentanyl (Sublimaze)**

- Fentanyl is an analgesic anesthetic narcotic

### **Indications**

- Pain Management (Trauma-15)
- Acute Coronary Syndrome (ACS) (ACLS-3)
- STEMI (ACLS-4)

### **Contraindications**

- Hemorrhage
- Hypersensitivity
- Shock

### **Side effects**

- Decreases respiratory
- Apnea
- Bradycardia
- Muscle rigidity

### **Dosage**

- Adults dose: 25-50 mcg IM, slow IVP, or Intranasal (Repeat 25 mcg IM, slow IVP, or Intranasal)

For use with children 2-12 years of age

- Pediatric dose: 1 mcg/kg

## PHARMACOLOGY

## **Plavix (clopidogrel)**

- Inhibits platelet aggregation

### **Indications**

- Acute Coronary Syndrome/STEMI (ACLS-4)

### **Contraindications**

- Hypersensitivity
- Active bleeding
- Pathological bleeding (ulcers, cranial hemorrhage)

### **Side effects**

- Nose bleeds
- Coughing up blood
- Chest pains
- Numbness in body, weakness

### **Dosage**

- Adults dose: 600 mg PO