



Intermediate Medications

- Epinephrine – cardiac
- Epinephrine – anaphylaxis
- Dextrose
- Atropine
- Narcan
- Thiamine
- Albuterol



Needle Handling Precautions

- **Minimize the tasks performed in a moving ambulance**
 - **Balance the safety needs with the need to transport in a timely manner**
- **Immediately dispose of used sharps in a sharps container**
- **Recap needles only as a last resort**
 - **Learn the one-handed recapping maneuver**



Epinephrine

- **Class**

- Adrenergic agent; Sympathomimetic

- **Description**

- Causes marked stimulation of alpha, beta-1, and beta-2 receptors, causing sympathomimetic stimulation, pressor effects, cardiac stimulation, bronchodilation, and decongestion.

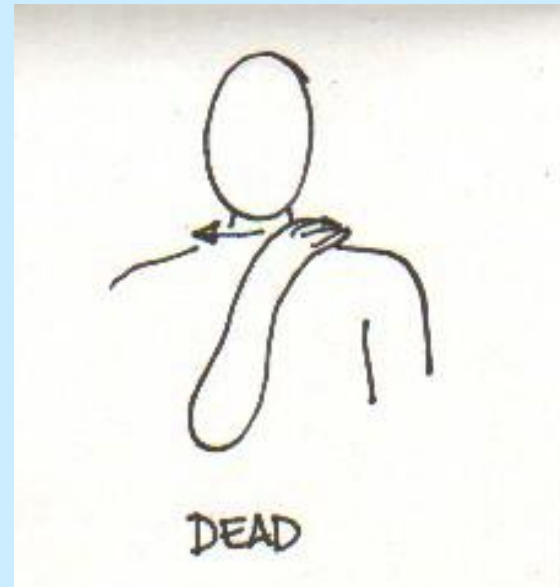
- Epinephrine 1:10,000 (Cardiac)

- Epinephrine 1:1,000 (Anaphylaxis)

● ● ● | Epinephrine 1:10,000

○ Indications for the EMT-Intermediate:

- Cardiac Arrest with asystole (flat line on the monitor) or PEA
- Asystole needs to be confirmed. Look at your patient!!
- Unresponsive, no pulse, no respiration, leads are attached properly, monitor is on, check in all 3 leads.



● ● ● | Epinephrine 1:10,000



○ Contraindications

- Epi 1:10,000 is contraindicated in patients not in full asystole cardiac arrest.

○ Side effects

- Epinephrine can cause palpitations, anxiety, headache, dizziness, nausea and vomiting. Because of its strong inotropic and chronotropic properties, epinephrine increases myocardial oxygen demand. Even in low doses it can cause myocardial ischemia. When administering epi in the emergency setting, these effects should be kept in mind.

Epinephrine 1:10,000

- **How Supplied**

- 1mg in 10 cc prefilled

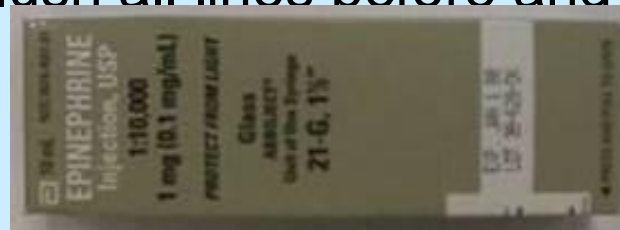


- **Dosage**

- 1 mg of a 1:10,000 solution IV Push. Repeat q 3-5 minutes

- **Special Considerations**

- Should be protected from light. Do not administer with alkaline solutions for it can be deactivated. Flush all lines before and after administration.



Epinephrine 1:1,000

○ Indications

● Anaphylaxis

- is suspected exposure to an allergen AND one or more of the following:
- severe respiratory distress;
- airway compromise / impending airway compromise (wheezing, swelling of the lips / tongue, throat tightness);
- signs of shock (including systolic BP <90).

○ Contraindications

- None in a LIFE THREATENING emergency





Epinephrine 1:1,000

○ Side effects

- Epinephrine can cause palpitations, anxiety, headache, dizziness, nausea and vomiting. Because of its strong inotropic and chronotropic properties, epinephrine increases myocardial oxygen demand. Even in low doses it can cause myocardial ischemia. When administering epi in the emergency setting, these effects should be kept in mind.

○ How Supplied

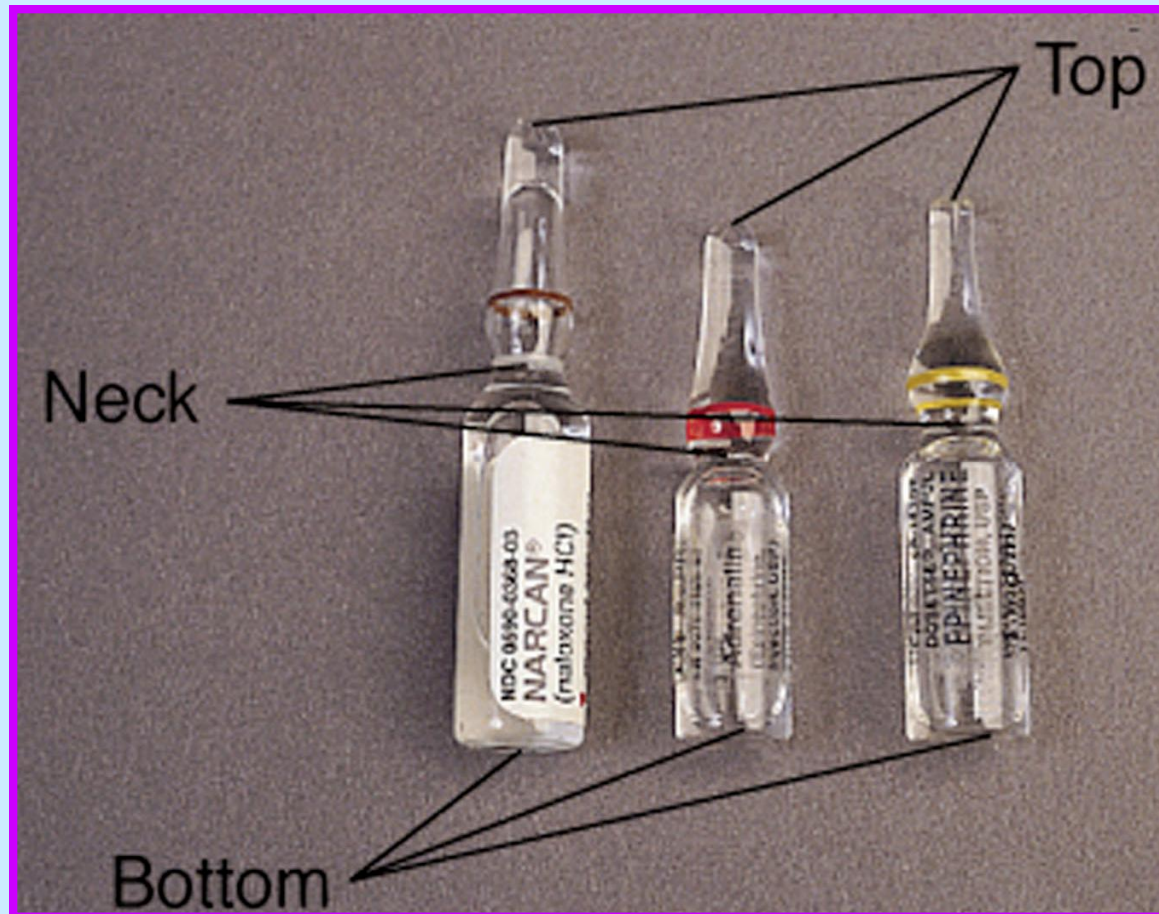
- 1mg in 1 cc ampoule or prefilled syringe

○ Dosage

- 0.3mg of a 1:1,000 solution SQ. Consider repeating q 3-5 minutes



Ampules





Ampules

- Hold the ampule upright & tap the top to dislodge any trapped solution.
- Place gauze around the thin neck.
 - Wear proper PPE



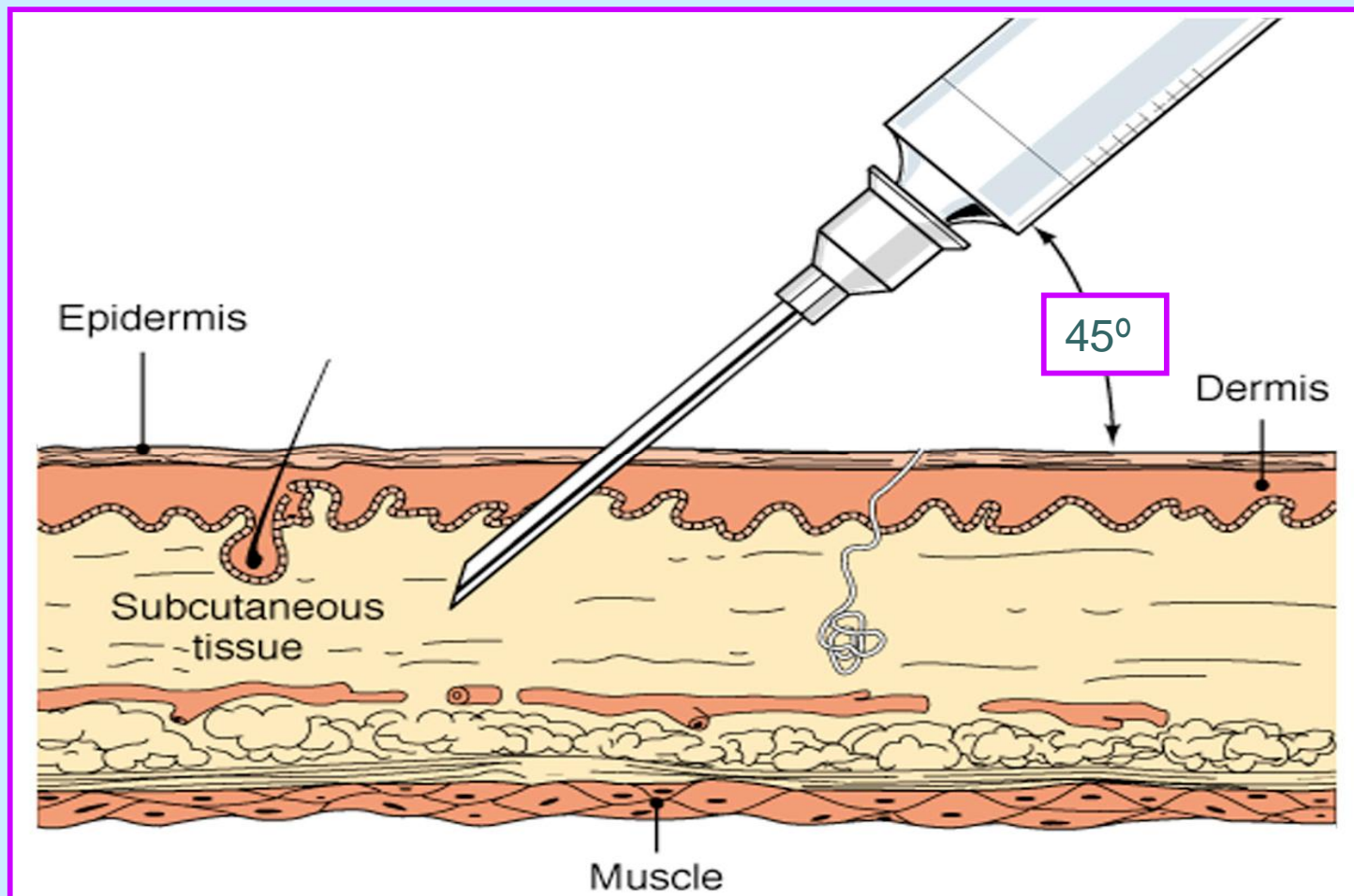


Ampules

- Snap top off with your thumb.
- Draw up the medication.
 - Use a filtered needle to draw up
 - Change to proper sized needle
- Dispose of in sharps container

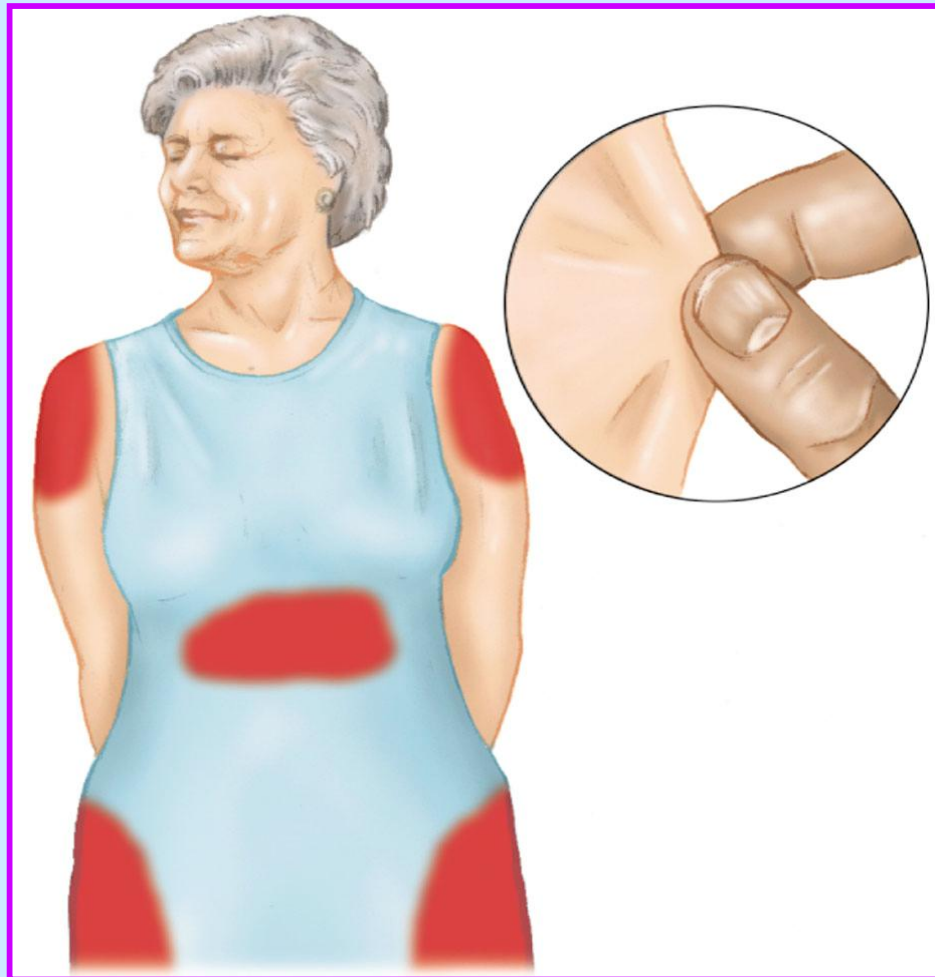


Subcutaneous Injection



-
-
-

Subcutaneous Injection



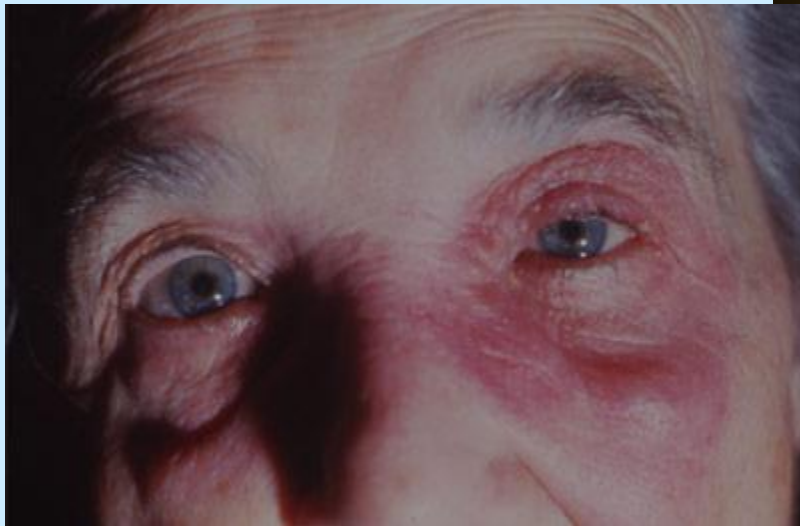


Localized Reaction





Example of Anaphylaxis



Epinephrine 1:1,000

- **Onset**
 - SQ 5-10 min
- **Duration**
 - SQ 4-6hrs
- **Special Considerations**
 - Should be protected from light. Do not administer with alkaline solutions for it can be deactivated. Flush all lines before and after administration
 - Fatal ventricular fibrillation, cerebral or subarachnoid hemorrhage obstruction of central retinal artery. A rapid and large increase in BP may cause aortic rupture, cerebral hemorrhage, or angina pectoris





Dextrose – D50

- **Class**

- Carbohydrate, hypertonic solution

- **Description**

- the principal form of carbohydrate utilized by the body. D50 is used in emergency care to treat hypoglycemia and in the management of coma of unknown origin.



Dextrose – D50

○ Indications

- Hypoglycemia, blood glucose <80mg/dl
- altered level on consciousness, coma of unknown etiology, seizure of unknown etiology.

○ Contraindications

- Intracranial hemorrhage, increased ICP, Known or suspected CVA.



Dextrose – D50

- **How supplied**
 - 25 gm in 50cc prefilled syringe
- **Dose**
 - 25 gm slow IV push
- **Onset**
 - ≤ 1 minute
- **Duration**
 - Depends on degree of hypoglycemia





Dextrose – D50

○ Special Considerations

- **extravasations may cause tissue necrosis** (use large vein and ensure patency of IV)
- Rebound hypoglycemia
- D50 may sometimes precipitate severe neurological symptoms (**Wernicke's encephalopathy**) in thiamine deficient patients, for example, alcoholic.
(Administering 100 mg of thiamine, IV can prevent this.)

○ Adverse reaction

- Warmth, pain, burning from medication infusion thrombophlebitis



Thiamine (B1)

○ Class

- Water-soluble vitamin

○ Description

- Required for the synthesis of thiamine pyrophosphate, a coenzyme required in carbohydrate metabolism.
- Aids in energy (carbohydrate) metabolism
- Enables normal functioning of the nervous system
- Necessary for proper functioning of the heart



Thiamine (B1)

○ Indications

- Hypoglycemia, in the presence of chronic alcoholism, alcohol intoxication, or malnourishment, administer

○ Contraindications

- do not use with substances that yield alkaline solutions, such as citrates, barbiturates, carbonates, or erythromycin lactobionate IV



Thiamine (B1)

- How Supplied

- 100 mg vial

- Dose

- 100 mg IVP

- Onset

- varies

- Duration

- varies





Thiamine (B1)

Side Effects

Serious hypersensitivity reactions,
including anaphylaxis

Special Consideration

Use with caution during lactation.

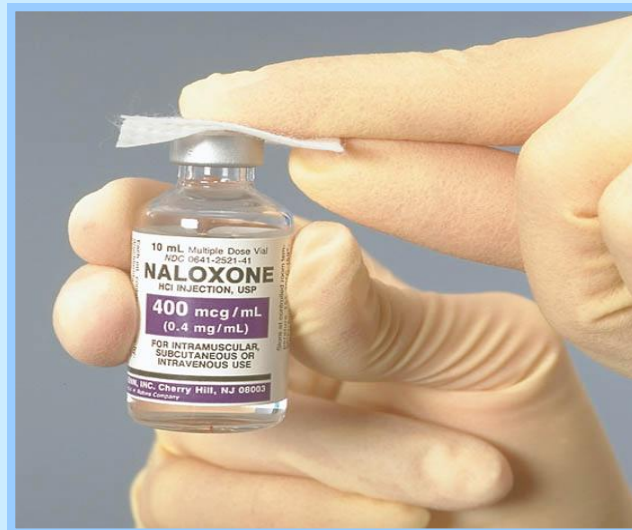
● ● ● |
Vials





Vials

- Remove the plastic cap.
- Cleanse the vial's rubber top.





Vials

- Prepare the syringe and needle
- Insert the needle into the rubber top and inject the air from the syringe into the vial
- Draw desired dose into syringe & administer





Naloxone (Narcan)

○ Class

- Synthetic opioid antagonist

○ Description

- is a competitive narcotic antagonist used in the management and reversal of overdoses caused by narcotics and synthetic narcotic agents. Unlike other narcotic antagonists, which do not completely inhibit the analgesic properties of opiates, naloxone antagonizes all actions of morphine





Naloxone (Narcan)

- **Indications**

- For the complete or partial reversal of narcotic depression, including respiratory depression, induced by opioids including natural and synthetic narcotics. Narcan is also indicated for the diagnosis of suspected acute opioid overdoses.

- **Contraindications**

- Known hypersensitivity
- Use with caution in narcotic-dependent patients who may experience withdrawal syndrome



Naloxone (Narcan)

- **How supplied**
 - Multidose vials, prefilled syringes, ampules
- **Dosage**
 - 0.4mg - 2.0mg IVP SLOWLY, Titrate to respirations
- **Onset**
 - Within 2 minutes
- **Duration**
 - 30 – 60 minutes

Naloxone (Narcan)

○ Side Effects

- Tachycardia
- Hypertension
- Dysrhythmias
- Nausea and vomiting
- Diaphoresis



○ Special Considerations

- Caution should be exercised when administering naloxone to narcotic addicts (may precipitate withdrawal with hypertension, tachycardia, and violent behavior).

● ● ● | Atropine

○ Class

- Cholenergic blocking agent
- parasympatholytic

○ Description

- Atropine is a parasympatholytic that is derived from parts of the *Atropa belladonna* plant
- Atropine acts by blocking acetylcholine receptors (Vagus nerve) thus inhibiting parasympathetic stimulation.
- Atropine has been shown to be of some use in asystole, presumably because some cases of asystole may be caused by a sudden and tremendous increase in parasympathetic tone.

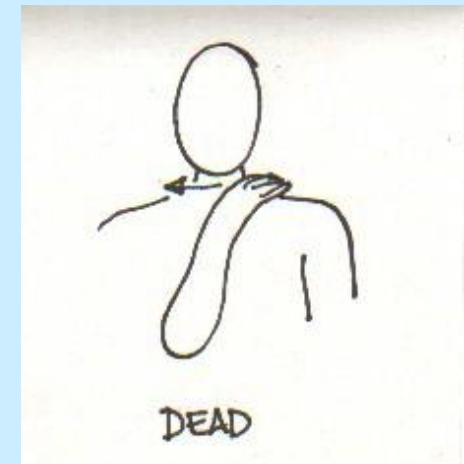


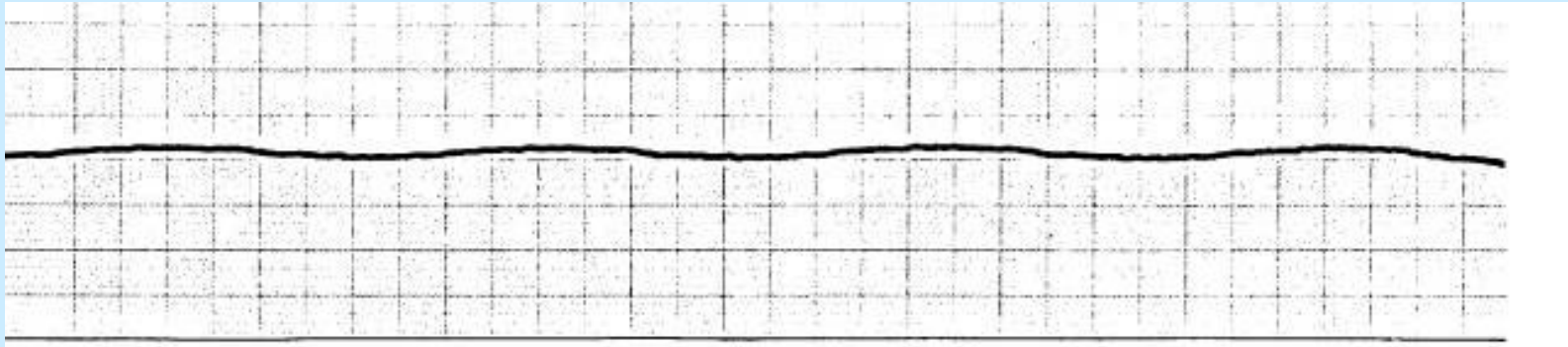


Atropine

○ Indications

- Cardiac arrest with asystole (flat line on the monitor)
- Asystole needs to be confirmed. Look at your patient!!
- Unresponsive, no pulse, no respiration, leads are attached properly, monitor is on, check in all 3 leads.
- Slow PEA







Atropine

○ Contraindications

- None in an emergency asystole cardiac arrest.
- In bradycardia:
 - Tachycardia
 - Hypersensitivity
 - Unstable cardiovascular status in acute hemorrhage and myocardial ischemia
 - Narrow-angle glaucoma



Atropine

- **How supplied**

- 1 mg in 10 cc prefilled syringe

- **Dose**

- 1 mg IV push every 3-5 minutes not to exceed 0.04mg/kg.

- **Onset**

- rapid

- **Duration**

- 2 -6 hours



Atropine

- **Side effects**: blurred vision, dilated pupils, dry mouth, tachycardia, drowsiness and confusion.
- **Special Considerations**
 - Heart transplant patient, vagus nerve has been severed.
 - The effects of atropine may be enhanced by antihistamines, procainamide, quinidine, antipsychotics, antidepressants, and benzodiazepines



Albuterol

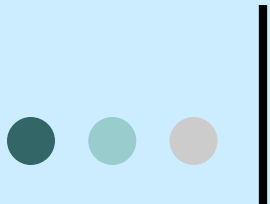
- **Class**

- Sympathomimetic

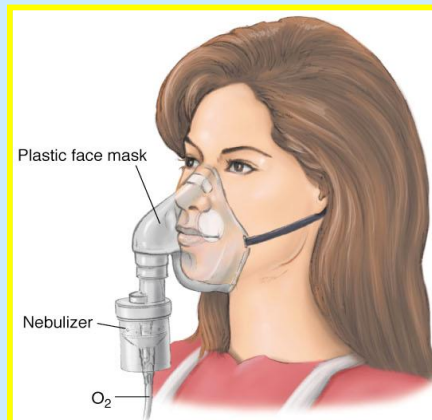
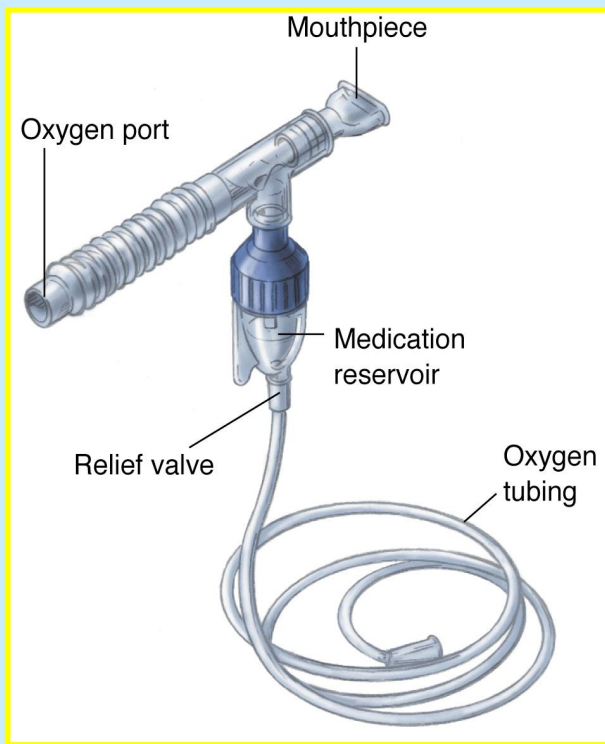
- **Description**

- Beta 2 -selective sympathomimetic. Relaxes smooth muscle of the bronchial tree and peripheral vasculature.
- inhaled beta-adrenergic agonists

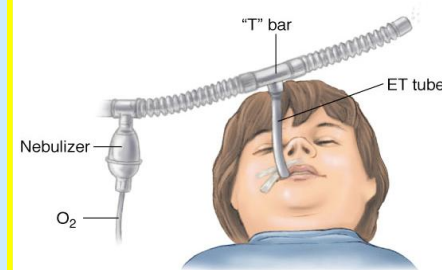




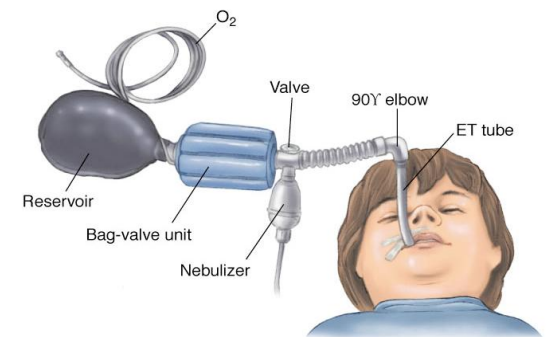
Nebulizer



(a) Nebulizer with attached face mask

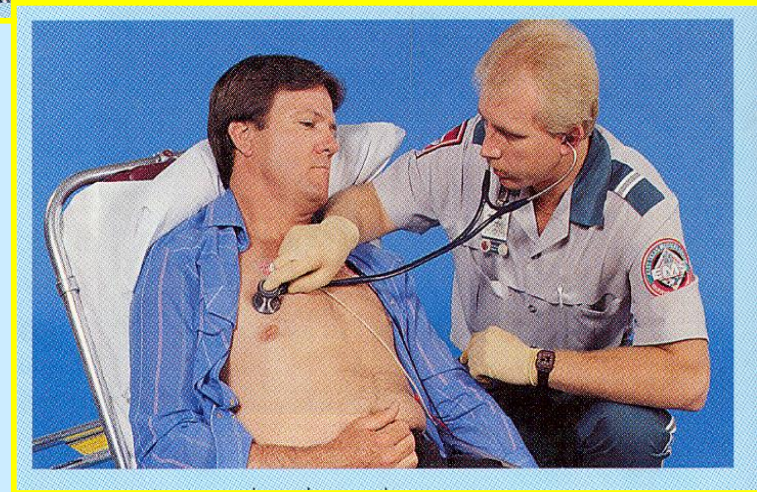
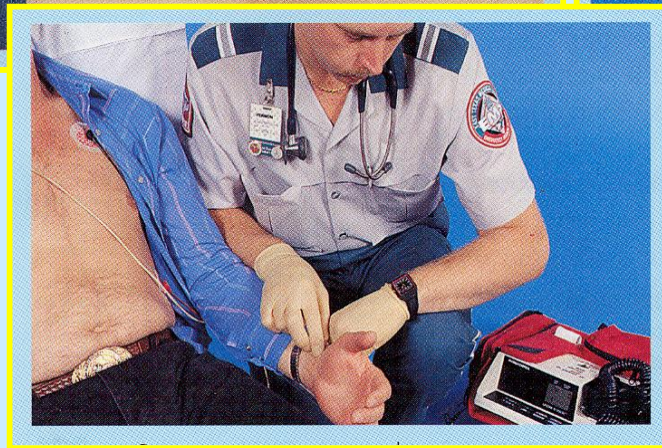
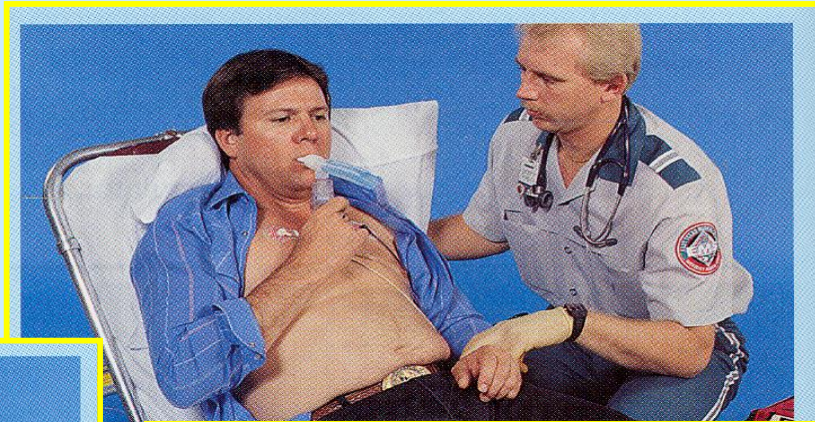


(b) Nebulizer with endotracheal tube



(c) Nebulizer with bag-valve unit

Drug – Albuterol (Proventil, Ventolin)





Albuterol

○ Indications

- relief of bronchospasm in patients with reversible obstructive airway disease and acute attacks of bronchospasm.

○ Contraindications

- Prior hypersensitivity reaction to albuterol
- Cardiac dysrhythmias associated with tachycardia



Albuterol

- **How supplied**

- Multidose vial, prefilled “bullets”

- **Dose**

- 2.5 mg (0.5 ml of 0.5% solution) diluted to 3 ml with 0.9% saline solution. Administer of 5-15 minutes by nebulizer.

- **Onset**

- 5-15 minutes after inhalation

- **Duration**

- 3-4 hours after inhalation



Albuterol

○ Side Effects

- Restlessness, apprehension, dizziness, palpitations, increase in BP, dysrhythmias, increased hypoxemia



Albuterol

○ Special Considerations

- As with all sympathomimetics, may exacerbate adverse cardiovascular effects. May precipitate angina pectoris and dysthythmias, MI, cardiac arrest.
- Albuterol should be administered with extreme caution to patients being treated with monoamine oxidase inhibitors or tricyclic antidepressants, since the action of albuterol on the vascular system may be potentiated.
- Beta-receptor blocking agents and albuterol inhibit the effect of each other.
- Since albuterol may lower serum potassium, care should be taken in patients also using other drugs which lower serum potassium as the effects may be additive