Sierra – Sacramento Valley EMS Agency

BLS AUTO-INJECTOR EPINEPHRINE ADMINISTRATION OPTIONAL SKILL

(UPDATED 08/2017)
In order for PSFA, EMR or EMT personnel to administer auto-injector epinephrine, they must:

✓ Be part of the organized EMS system, functioning under the oversight of an S-SV EMS approved BLS optional skills provider

✓ Be authorized by the approved BLS optional skills provider to administer auto-injector epinephrine

✓ Have received adequate training on auto-injector epinephrine administration

Auto-injector epinephrine administration for severe asthma is only approved for EMT personnel
Purpose

- To enable authorized PSFA, EMR and EMT personnel to administer epinephrine via auto-injector to patients in the prehospital setting

Objectives

- Identify causes, signs & symptoms of allergic reaction, anaphylaxis and severe asthma
- Describe EMS care of a patient with allergic reaction, anaphylaxis, or severe asthma, including indications for the administration of epinephrine
• Objectives (cont.)
  o Demonstrate knowledge of dosages, administration methods, actions, indications and contraindications of epinephrine administration to a patient with anaphylaxis or severe asthma
  o Demonstrate knowledge of storage, inspection, handling and disposal of auto-injector epinephrine devices
  o Demonstrate ability to properly administer epinephrine via auto-injector device
# Allergic Reaction/Anaphylaxis: Causes, Signs & Symptoms

## Causes

- Fish
- Dog
- Egg
- Peanut
- Plant
- Milk

## Symptoms

### Skin
- Hives, swelling, warmth, redness

### Respiratory
- Coughing, wheezing, shortness of breath, hay-fever symptoms

### Gastro-Intestinal
- Nausea, stomach pain or cramps, vomiting, diarrhea

### Cardio-Vascular
- Dizziness, weak pulse, fainting, shock, loss of consciousness

### Neurological
- Anxiety, feeling of impending doom
• Immune System Overview
  o The immune system is part of the circulatory system
  o It helps protect the body from foreign substances that might be damaging (viruses, bacteria, toxins, etc.)
  o Substances that the body recognizes as foreign are called antigens
Antigens and Antibodies

- Antigens enter the body through contact with the skin (absorption), a bite or sting (injection), gastrointestinal tract (ingestion), or respiratory system (inhalation)
- When an antigen enters the body, the immune system produces an antibody to that substance
- Antibodies protect the person if they are exposed to the same substance again
- The next time an antigen is found in the body, antibodies will quickly identify it and attack
Allergic Reaction

- An exaggerated response of the body to a foreign substance (allergen) by neutralizing or getting rid of the substance.
- One of the most common health problems in the United States.
- Allergic reactions range from mild (slow onset with minor symptoms) to severe/life threatening (sudden onset with major symptoms affecting the airway, breathing and circulation).
Allergic Reaction Signs & Symptoms (slow onset)

- Hives
- Pruritus
- Flushing
- Rash
- Nasal congestion
- Watery eyes
- Angioedema (swelling) not involving the airway
Anaphylaxis

- Sudden and rapid onset of severe symptoms
- A reaction of an antigen and an antibody resulting in the release of histamine, causing the blood vessels to dilate and capillaries to leak fluids into surrounding cells
- Profound dilation of blood vessels causes the blood pressure to fall resulting in shock
- Fluid leaking from the capillaries results in profuse swelling of the skin, mucosa, face, tongue and airway
Allergic Reaction/Anaphylaxis

- Anaphylaxis Signs & Symptoms (rapid onset)
  - Respiratory distress
  - Bronchospasm/wheeze/diminished breath sounds
  - Hoarseness &/or stridor
  - Edema involving the airway
  - Hives &/or swelling (face, tongue, lips, extremities)
  - Hypotension (SBP < 90)
Common Causes of Allergic Reactions/Anaphylaxis
Asthma Causes, Signs & Symptoms
Asthma Triggers

- Exposure to various allergens can trigger asthma signs/symptoms, these triggers are different from person to person and can include:
  - Airborne substances (pollen, dust mites, mold spores, etc.)
  - Respiratory infections, such as the common cold
  - Physical activity (exercise-induced asthma)
  - Air pollutants and irritants, such as smoke
  - Cold air
  - Certain medications, including beta blockers, aspirin, ibuprofen, naproxen
  - Strong emotions and stress
  - Sulfites and preservatives added to some types of foods and beverages
  - Gastroesophageal reflux disease (GERD)
Asthma Pathophysiology

- Increased tracheal and bronchial reactivity
  - Causes widespread reversible airway narrowing (bronchospasm) with increased mucus production
Asthma

• Asthma Signs & Symptoms
  o Wheezing
  o Coughing
  o Shortness of breath
  o Chest tightness/pain
  o Patient looks tired
  o Cyanosis
Assessment & Treatment Of:

- Allergic Reaction
- Anaphylaxis
- Severe Asthma
Assessment & Treatment

• Assessment
  
  o Assess respiratory status, manage airway and assist ventilations as appropriate
    
    ▪ During anaphylaxis the tongue may become so swollen that it blocks the airway – positioning can help make breathing easier
    
    ▪ During anaphylaxis airway adjuncts may be of limited value because the airway may be obstructed at the larynx – you may need to use a BVM to force air past the swollen tissues
    
    ▪ BVM ventilations may be difficult due to narrowing of the airways from bronchoconstriction
Assessment & Treatment

• Assessment
  o Assess history/physical, determine degree of illness
  o Assess vital signs (including pulse oximetry if available)
  o Do not delay care of critical patients to ask detailed questions
Assessment & Treatment

- **Treatment**
  - Administer supplemental $O_2$ at appropriate rate
    - If patient has signs of respiratory distress or is in anaphylactic shock, administer high flow $O_2$ via NRM or BVM
  - Place the patient in a position of comfort
    - If hypotensive due to anaphylaxis, use the Trendelenburg position (supine with the feet about a foot above the head)
    - If in respiratory distress, a sitting position may be preferred
  - Determine if epinephrine administration is appropriate
• **Epinephrine Indications**
  
  o **Anaphylaxis (PSFA, EMR, or EMT)**
    - Patients with suspected anaphylaxis in severe distress
  
  o **Severe Asthma (EMTs only)**
    - Patients with suspected asthma in severe distress
• Epinephrine
  o Generic name
    ▪ Epinephrine
  o Trade names
    ▪ EpiPen®
    ▪ EpiPen Jr.®
    ▪ Adrenaclick®
• **Epinephrine**
  
  o **Actions**
    - Dilates bronchioles (airways)
    - Constricts blood vessels
    - Increases heart rate and cardiac output
  
  o **Onset and duration**
    - The patient notices improvement in seconds to minutes
    - Epinephrine is short lived, lasting about 10 – 20 minutes
Epinephrine

- Contraindications/precautions
  - Pulmonary edema
  - Hypothermia
  - Use with caution in patients > 35 years old, or with a history of coronary artery disease (CAD) or hypertension (HTN)
  - There are no contraindications when used in a life-threatening situation
Epinephrine

- Drug interactions
  - Potentiates other sympathomimetics
  - Patients taking monoamine oxidase (MAO) inhibitors, antihistamines and tricyclic antidepressants may experience heightened effects
Epinephrine

- Side effects
  - Ventricular arrhythmias
  - Increased heart rate
  - Chest pain/angina
  - Hypertension
  - Pallor
  - Nausea
  - Anxiety/excitement
  - Dizziness

- Headache
- Vomiting
Assessment & Treatment

- Epinephrine
  - Dosage
    - Adult (> 30 kg)
      - One (1) adult auto-injector (0.3 mg)
    - Pediatric (15 – 30 kg)
      - One (1) pediatric auto-injector (0.15 mg)
• Epinephrine
  o Administration route
    ▪ Deep intramuscular (IM) injection
    ▪ Lateral thigh, midway between waist and knee
Epinephrine Auto-Injector

Directions for use

- Grasp the auto-injector with the hand (forming a fist around the unit) with the black tip facing downward.

- Immediately before use, remove the grey activation cap with the other hand, being careful not to touch the tip where the needle is located.
• Epinephrine Auto-Injector
  o Directions for use (cont.)
    ▪ Place the black tip near the fleshy outer portion of the thigh
    ▪ The preferred method is to expose and cleanse the area to be used for medication administration, but the auto-injector is designed to work effectively through clothing if needed
Epinephrine Auto-Injector

- Directions for use (cont.)
  - With a quick motion, swing out and jab firmly into the outer thigh, so that the injector is at a $90^\circ$ angle to the thigh
  - Hold firmly in the thigh for several seconds while the spring activated mechanism is released, and the dose of epinephrine is administered
• Epinephrine Auto-Injector
  o Directions for use (cont.)
    ▪ Remove the auto-injector and massage the injection site for approximately 10 seconds
    ▪ Check the tip of the auto-injector – if the needle is exposed, the epinephrine dose was injected, if not, the previous steps should be repeated
• Epinephrine Auto-Injector
  o Directions for use (cont.)
    ▪ Most of the liquid stays in the auto-injector after the dose is administered and cannot be reused
    ▪ To avoid accidental needle stick, carefully return the auto-injector to its carrying tube (needle first) without replacing the grey safety cap (DO NOT RECAP THE NEEDLE)
    ▪ Properly dispose of the used auto-injector in an approved sharps container as soon as possible (ALS ambulance or receiving hospital)
Reassessment

- Reassessment after epinephrine administration
  - Continually reassess the patient’s airway, breathing and circulatory status until patient care is transferred to ALS personnel or the receiving hospital (as applicable)
  - Recheck vital signs every five (5) minutes
  - Monitor for signs of deterioration including:
    - Decreasing mental status
    - Increased breathing difficulty
    - Decreasing blood pressure
Reassessment

- Reassessment after epinephrine administration (cont.)
  - If patient worsens, contact medical control (if able) and request permission to administer an additional dose of epinephrine (if available)
  - Initiate CPR and AED if the patient becomes pulseless
  - If patient condition improves, provide supportive care
    - High flow O₂
    - Treat for shock (hypoperfusion)
• Epinephrine Auto-Injector Storage/Use
• Epinephrine Auto-Injector Administration Reporting and Documentation
**Storage/Use Requirements:**

- Store in original container, easily accessible for emergency use
- Store at room temperature, out of direct sunlight
- Regularly inspect for color and clarity
  - Replace/do not use if the liquid is discolored or cloudy
- Regularly check expiration date
  - Do not use past labeled expiration date
• Administration Reporting and Documentation
  o Inform other appropriate EMS providers and/or the receiving hospital of any pertinent details related to the epinephrine administration
  o Adequately document the epinephrine administration for reporting and QI review requirements