

*East Brandywine Fire Company*

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# EpiPen Training

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*East Brandywine Fire Company*

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# Learning Objectives

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- ❖ What is Anaphylaxis?
- ❖ Signs and Symptoms of Anaphylaxis
- ❖ When to use a EpiPen
- ❖ How to administer EpiPen?
- ❖ How to document EpiPen?



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# Background

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- ❖ The EpiPen is based off the Cold War era nerve gas antidote “atropine” self-injectors given to troops
- ❖ In the 1970s inventor Sheldon Kaplan modified the pens to deliver epinephrine
- ❖ EpiPen replaced “Ana-Kit” which consisted of a syringe, needle and unit dose vial of epinephrine
- ❖ Epinephrine is a hormone which is excreted for the adrenal glands.
- ❖ Epinephrine means “atop the kidney”
- ❖ The medication inside EpiPen is a synthetic version of the hormone



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# Indication for Use

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- ❖ Indicated for emergency treatment of type 1 allergic reactions, including anaphylaxis, to allergens, idiopathic and exercise-induced anaphylaxis, and in patients with a history or increased risk of anaphylactic reactions.
- ❖ Epinephrine, is a non-selective alpha and beta-adrenergic receptor agonist used to treat anaphylaxis

# Pathophysiology Review



A video in collaboration between the Association of  
American Medical Colleges and Khan Academy

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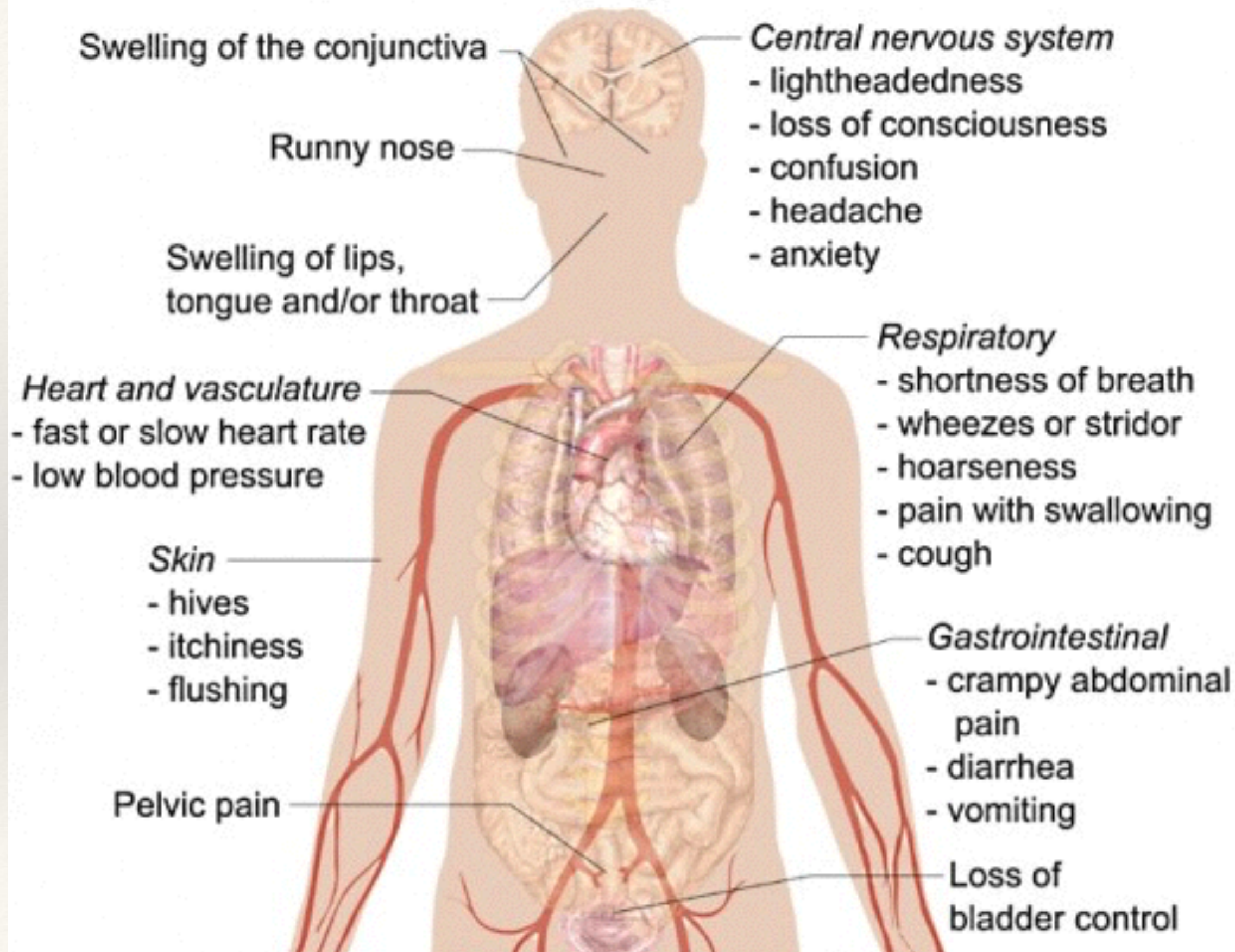
# Signs and Symptoms of Anaphylaxis

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- ❖ Difficulty Breathing or SOB
- ❖ Wheezing
- ❖ Urticaria “hives”
- ❖ Angioedema
- ❖ Nausea & Vomiting,
- ❖ Pruritus “severe itching of skin”



# Signs and symptoms of Anaphylaxis



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# Assessment

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- ❖ Assess ABC's and adequacy of mentation "*alertness and orientation*"
- ❖ Auscultate lung sounds "wheezing & / or stridor"
- ❖ Vital signs HR, RR, BP and O2 Saturation
- ❖ Assess for severe angioedema of tongue and lips
- ❖ Assess skin for hives
- ❖ Assess for allergens that may have caused the reaction



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# Treatment of Anaphylaxis

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- ❖ **Epinephrine**
- ❖ **Albuterol** *“bronchospasm aka wheezing”*
- ❖ **Racemic epinephrine** *“Laryngeal swelling aka stridor”*
- ❖ **High Flow Oxygen**
- ❖ **Intravenous Fluids** *“Normal Saline or Lactated Ringers”*
- ❖ **Antihistamines H1** *“Benadryl”* and **H2** *“Pepcid or Zantac”*
- ❖ **Corticosteroids** *“methylprednisolone or Prednisone”*
- ❖ **Remove source of antigen if possible**

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# BLS Protocol

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- ❖ Per PA Department of Health Basic Life Support Protocols 2015
- ❖ EMT's can administer EpiPens to patients having "*severe allergic reaction*"
- ❖ Symptoms of severe allergic reaction include:
  - a. *Difficulty breathing and wheezing.*
  - b. *Swollen tongue and lips or difficulty swallowing.*
  - c. *Hypotension.*





**ALLERGIC REACTION / ANAPHYLAXIS  
STATEWIDE BLS PROTOCOL****Criteria:**

- A. Severe Allergic Reaction:** A patient with the following symptoms of severe allergic reaction or anaphylaxis after suspected exposure to an allergen:
1. Symptoms of severe allergic reaction include:
    - a. Difficulty breathing and wheezing.
    - b. Swollen tongue and lips or difficulty swallowing.
    - c. Hypotension.
  2. Common allergens that may lead to allergic reactions include
    - a. Bee/ Wasp/ Hornet stings
    - b. Medications (e.g. antibiotics)
    - c. Foods (e.g. peanuts, seafood)
- B. Moderate Allergic Reaction:** A patient with a moderate allergic reaction may have:
1. Mild shortness of breath with wheezing
  2. Extensive hives and itching
  3. Mild tongue/ lip swelling without difficulty swallowing or shortness of breath.

**Exclusion Criteria:**

- A. Mild allergic reaction** isolated to minor hives without any of the criteria listed above.<sup>1</sup>

**System Requirements:**

- A. Only an EMT** that has completed the EPINEPHrine patient-assisted auto-injector module through the EMT curriculum or continuing education may administer patient-assisted EPINEPHrine by auto-injector.
- B. [Optional]** BLS services may carry EPINEPHrine auto-injectors for administration by the agency's EMTs.
1. These services must comply with Department of Health EPINEPHrine auto-injector requirements for these services and for the training of service providers before the service is permitted to stock and carry EPINEPHrine auto-injectors.
  2. These services must carry 2 adult and 2 pediatric dose EPINEPHrine auto-injectors that are stored and maintained in a manner consistent with Department requirements.

**Treatment:**

- A. All patients treated by BLS services that DO NOT carry EPINEPHrine auto-injectors (i.e. patient-assisted EPINEPHrine):**
1. Initial Patient Contact – see Protocol # 201.
    - a. Consider call for ALS if available. See Indications for ALS Use protocol #210.
  2. Administer oxygen. (High concentration if difficulty breathing or signs of shock)
  3. Determine the severity of the patient's symptoms.
    - a. For severe symptoms listed above:
      - 1) If the patient has a prescribed EPINEPHrine auto-injector, assist<sup>2</sup> with the administration of single unit dose of EPINEPHrine via auto injector.<sup>3,4,5,6,7</sup> [EMT ONLY]
        - a) **Adult dose 0.3 mg (e.g. EpiPen)**
        - b) **Pediatric dose 0.15 mg (e.g. EpiPen Junior)**
      - 2) Monitor vital signs and reassess patient.
      - 3) Contact medical command.
    - b. For moderate symptoms listed above:
      - 1) Contact medical command if the patient has a prescribed EPINEPHrine auto-injector.
  4. Monitor vital signs and reassess patient.

**5. Monitor pulse oximetry – See Pulse Oximetry Protocol #226.**

6. Transport.

**B. All patients treated by EMTs functioning with BLS services that are approved to carry EPINEPHrine auto-injectors (i.e. primary administration of EPINEPHrine) [OPTIONAL]:**

1. Initial Patient Contact – see Protocol # 201.

a. Consider call for ALS if available. See Indications for ALS Use protocol #210.

2. Administer high concentration oxygen.

3. Determine severity of patient's symptoms

a. For severe symptoms listed above:

1) Administer a single unit dose of EPINEPHrine via auto injector.<sup>4,5,7</sup>a) **Adult dose 0.3 mg (e.g. EpiPen)**b) **Pediatric dose 0.15 mg (e.g. EpiPen Junior)**

2) Monitor vital signs and reassess patient

3) Contact Medical Command.

b. For moderate symptoms listed above, Contact Medical Command and follow directions of medical command physician.

4. Monitor vital signs and reassess patient.

**5. Monitor pulse oximetry – See Pulse Oximetry Protocol #226**

6. Transport

7. Contact Medical Command if condition worsens

**Possible Medical Command Orders:****A.** If patient has a second EPINEPHrine auto-injector, medical command physician may order EMT to assist patient with the administration of a second dose of EPINEPHrine.**B.** If BLS service carries EPINEPHrine auto-injector, medical command physician may order administration of EPINEPHrine.**Notes:**

1. Patients with mild allergic reactions should be reassessed for the development of more severe symptoms.

2. The EMT may need to administer the medication rather than assist if the patient has a decreased level of consciousness.

3. Assure that the available auto-injector was prescribed for the patient and is not expired.

4. Side effects of EPINEPHrine are rare. They include:

Increased heart rate	Vomiting	Excitability
Nausea	Chest Pain	Headache
Dizziness	Anxiousness	Pallor

5. Use caution in patients over 55 years old. Contact Medical Command if patient does not have severe symptoms as defined above or if unsure whether this is an allergic reaction.

6. If the patient does not have a prescribed EPINEPHrine auto injector, but there is a bystander available with an auto injector, contact medical command.

7. Dispose of the injector in a biohazard container.

**Performance Parameters:****A.** Review every case of EMT administered or assisted EPINEPHrine auto-injector use for documentation of symptoms defined in protocol.**B.** Review every case of EMT administered or assisted EPINEPHrine auto-injector for the appropriate contact with medical command as required by the protocol.**C.** Consider benchmark of on scene time < 10 minutes.



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# Dosage for EpiPens

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- ❖ **EpiPen 0.3 mg: Adult**
  - ❖ Patients greater than or equal to 30 kg (66 lbs)
- ❖ **EpiPen Jr® 0.15 mg: Pediatric**
  - ❖ Patients 15 to 30 kg (33 lbs to 66 lbs)
    - ❖ *Use Broselow Pediatric Emergency Tape if unsure*



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# Action of Epinephrine

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- Relaxes smooth muscle in the airways
- Counteracts histamine and other cytokines
- Raises blood sugar level
- Raises heart rate, blood pressure, and myocardial oxygen demand

For Intramuscular injection of Epinephrine...

Onset of effect: 3-5 min

Duration of effect: 1-4 hours



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# Warnings and Precautions

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- ❖ Administer with caution in patients with heart disease; may aggravate angina pectoris or produce ventricular arrhythmias.
- ❖ Do not inject intravenously, into buttock, or into digits, hands, or feet
- ❖ **Contraindications = NONE**

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# Adverse Reactions

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- ❖ Adverse reactions to epinephrine include anxiety, apprehensiveness, restlessness, tremor, weakness, dizziness, sweating, palpitations, pallor, nausea and vomiting, headache, and / or respiratory difficulties

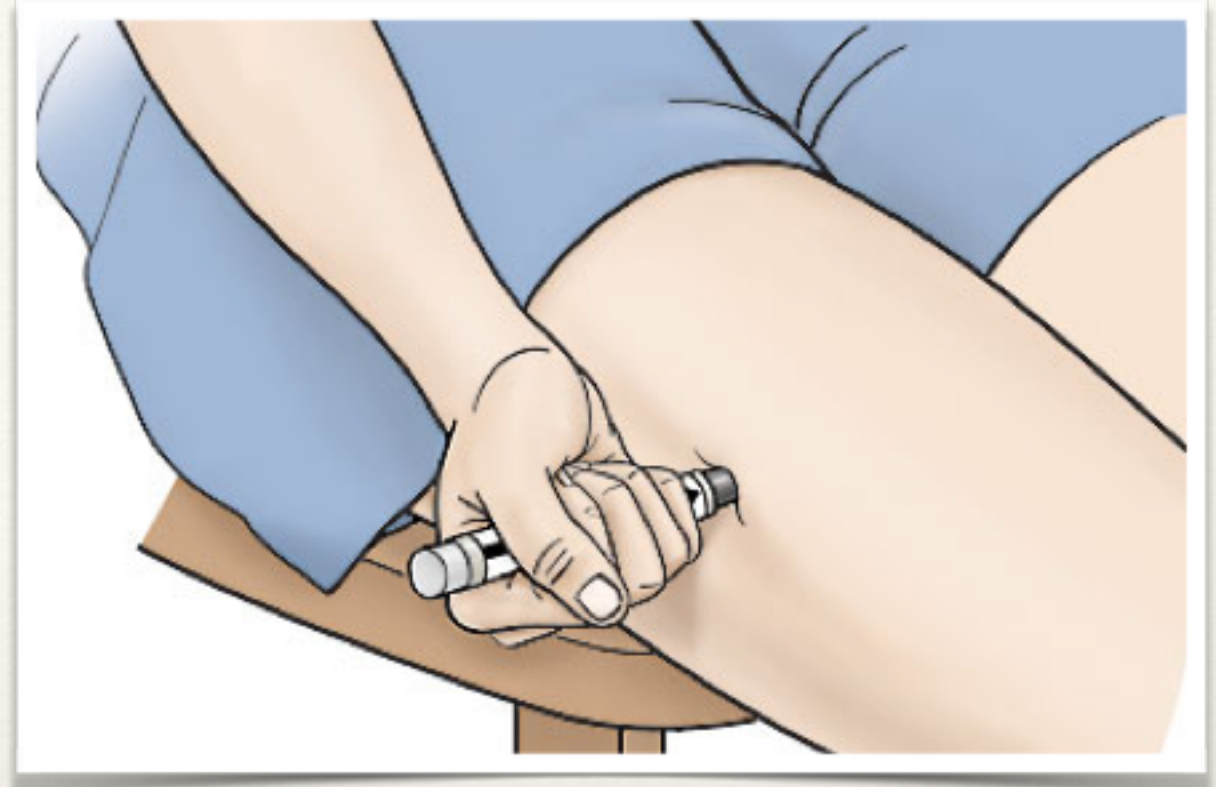


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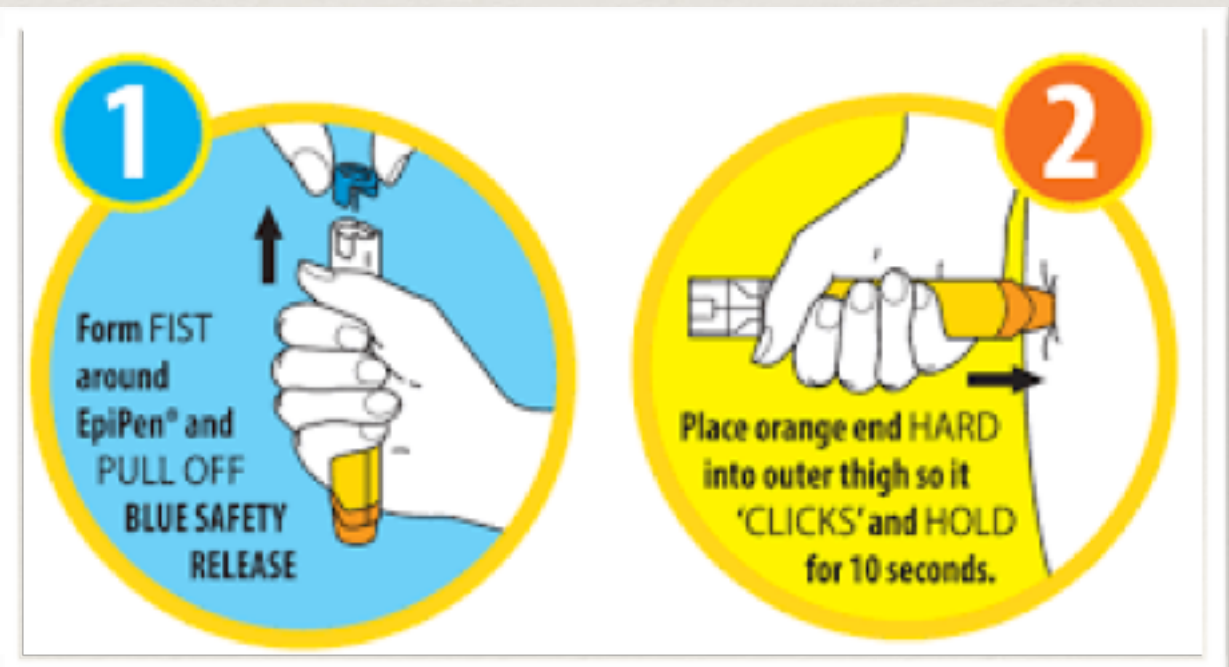
# Administration

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1. Remove the EpiPen® or EpiPen Jr® from the carrier tube.
2. Grasp the auto-injector in your fist with the orange tip pointing downward. With your other hand, remove the blue safety release by pulling straight up without bending or twisting it.
3. Hold the auto-injector with orange tip near the middle of the outer thigh (upper leg).
4. **Swing and firmly push the orange tip against the middle of the outer thigh** (vastus lateralis) until it 'clicks'. Keep the auto-injector firmly pushed against the thigh at a 90° angle (perpendicular) to the thigh.
5. Hold firmly against the thigh for approximately 10 seconds to deliver the medicine. The injection is now complete.
6. **Remove the auto-injector from the thigh.** The orange tip will extend to cover the needle.
7. Massage the injection area for 10 seconds.
8. Dispose of pen in sharps container



**Vastus Lateralis**





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# Six Rights of Medication Administration

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- ❖ Right Patient
- ❖ Right Medication
- ❖ Right Dose
- ❖ Right Route
- ❖ Right Time
- ❖ Right documentation

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# Administration Tips

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- ❖ Device can inject through clothing if needed
- ❖ No alcohol prep is required before injection
- ❖ Children might need arms and legs restrained
- ❖ If substance is cloudy or has particles and no other pen is readily available still administer in emergency situation
- ❖ If pen is expired can still be used in an emergency



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# Management Post Injection

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- ❖ Monitor Pulse-ox continuously
- ❖ Maintain Airway
- ❖ Provide ventilatory assistance if needed
- ❖ Consider call for ALS
- ❖ Place on cardiac monitor upon ALS arrival
- ❖ Prepare for IV placement (large bore)
- ❖ Reassess frequently for signs of rebound anaphylaxis

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# Post Call

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- ❖ Notify EMS Captain of EpiPen administration
- ❖ Ensure used pen is disposed of in sharps container
- ❖ No spare units in supply closet
- ❖ Deputy EMS Director will order replacement
- ❖ Document EpiPen administration in emsCharts





# Recent Recalls

- ❖ In October of 2015 2.8 Million Auvi-Q auto injectors were recalled
- ❖ Due to the device not injecting enough medication or none at all
- ❖ Concern that patients might not have replaced the units or not aware of recall



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# References

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- ❖ <http://www.chemheritage.org/discover/media/magazine/articles/31-3-mighty-pen.aspx>
- ❖ <http://emedicine.medscape.com/article/135065-differential>
- ❖ <https://www.epipen.com/en/about-epipen/how-to-use-epipen>
- ❖ <https://www.epipen.com/en/prescribing-information>
- ❖ <http://www.wsj.com/articles/sanofi-recalls-auvi-q-allergy-injectors-1446152933>