

# Epinephrine Auto-Injector Training

## *What is an “Allergic” reaction?*

An allergy is an overreaction of the immune system to a normally harmless substance called an “allergen.” These substances are commonly: pollen, dust, animal dander and some foods.

Allergic reactions can be mild to severe, a severe reaction is called *Anaphylaxis* and can be life-threatening!

When an allergy prone individual comes into contact with an allergen for the first time, their cells become activated to produce antibodies. Antibodies are a protein produced by the body’s immune system to identify and neutralize foreign objects in the body.

These new antibodies attach themselves to cells in the body that contain histamines.

Histamine is a signaling molecule contained in cells in the body. When released, histamines travel to histamine receptors throughout the body triggering a reaction. Histamines also do good things in the body such as: Immune response, gastric acid secretion and keeping the brain awake.

An overreaction of histamine release (such as a severe allergic reaction) can cause dangerous and lethal effects in the body.

When that same person comes into contact with that same allergen the second time (and subsequent times), the allergen binds to the antibody that was created upon first exposure that are now stored on the cells containing histamines. These cells in turn release histamines into the body.

Once released, histamines bind to histamine receptors in the body. These histamine receptors are primarily located in the blood vessels, bronchioles (air passages in the lungs), skin and the gastrointestinal tract. An over release of histamines (such as a severe allergic reaction - called anaphylaxis) will effect these systems as follows:

**Blood Vessels:** Dilate, making them more permeable, leading to redness, edema (swelling), mucus production and low blood pressure.

**Bronchioles:** Constrict causing shortness of breath.

**Skin:** Pain, itching, redness, hives

**Gastrointestinal Tract:** Stomach cramps, diarrhea

**Antihistamines** such as Benadryl (diphenhydramine), Zyrtec, Claritin and others work by blocking the histamine receptors so, even though the antibodies have triggered the cells to release histamines, the histamine receptors are blocked and can not “trigger” the allergic reaction. This is why some people feel sleepy after taking an antihistamine, it blocks the histamine receptor that keeps the brain awake.

**Note:** An antihistamine will not reverse the potential life-threatening effects already in place (caused by the over release of histamines). For mild allergic reactions or to prevent allergic reactions, antihistamines do well. *Antihistamines will stop further further binding of histamines to the receptors*, so it is sometimes used after administration of epinephrine. ***Only Epinephrine will reverse the life-threatening effects of anaphylaxis!***

**Epinephrine**, normally administered by lay persons via an “auto-injector”, does not block histamines, it can, however, save lives because it does the ***exact opposite*** of the histamine reaction. Epinephrine causes vasoconstriction and bronchial dilation. Blood pressure is brought back to normal, airways are open and swelling, especially in the mouth/throat area is reduced.

# Allergic Reactions Vs. Anaphylaxis

## Allergic Reactions:

### Inhalation -

- Itchy eyes
- Runny Nose
- Sneezing

### Cutaneous (Skin) -

- Local Reaction** (at the contact or sting site)
- Hives (raised red bumps - localized)
- Pruritus (itchy skin - localized)
- Angioedema (swelling - localized)
- Erythema (redness of the skin - localized)

### General -

- Normal Vital Signs

## Treatment:

- Remove trigger
- Antihistamines (H1 & H2)
- Steroids (if you can't remove trigger)

## Anaphylaxis:

### General -

- Systemic (Wide Spread / Multi-System) Response *-as opposed to localized allergic response*
- Any of the “allergic” skin responses - **Not Localized, but throughout the body**
- Swelling of the facial area (eyes, lips, tongue, neck & inside of mouth) - **Breathing Difficulty!**
- Airway Spasms (muscle contractions)
- Swelling of hands and/or feet

### Respiratory -

- Nasal Congestion
- Throat Tightness
- Chest Tightness
- Noisy Breathing
- Wheezing
- Hoarseness (vocal cords are swelling)
- Breathing Difficulty

### Cardiovascular -

- Dizziness
- Weakness
- Chest Pain
- Syncope (fainting)
- Heart Palpitations

### Gastrointestinal -

- Nausea
- Bloating
- Vomiting
- Diarrhea
- Abdominal Cramps

### Neurological -

- Headache
- Dizziness
- Syncope (fainting)
- Feeling of impending doom

## Treatment:

- Identify as Anaphylaxis
- EPINEPHRINE AUTO-INJECTOR**
- Remove Trigger
- Contact EMS
- Antihistamine (2nd line of defense....not in place of Epinephrine)
- Albuterol inhaler (if wheezing)
- Second dose of Epinephrine (if not recovering within 5 minutes)

\*Don't wait....the faster you get Epinephrine on board, the better! The longer you wait, the greater chance of severe reaction!