

EPINEPHRINE ADMINISTRATION FOR ANAPHYLAXIS

OVERVIEW OF ANAPHYLAXIS

Anaphylaxis is an allergic reaction that has life-endangering effects on the circulatory and respiratory systems. Anaphylaxis is an almost immediate, rapidly progressive multisystem allergic reaction to a foreign protein injected into the body by stinging and biting insects, snakes, and sea creatures or ingestion or inhalation of food, chemicals, and medications. Early recognition and prompt treatment, particularly in a wilderness setting, is essential to preserve life. The onset of symptoms usually follows quickly after an exposure (minutes after a sting or bite, within 30-60 minutes following ingestion). Rebound or recurrent reactions can occur within 24 to 72 hours of the original episode.

In addition to shortness of breath, weakness and dizziness, victims also frequently complain of a sense of impending doom, cough, chest tightness, trouble swallowing, abdominal cramps, or generalized itching. Physical findings include rapid heart rate, low blood pressure, and other evidence of shock, upper airway obstruction (stridor) and lower airway obstructions (wheezes) with labored breathing, generalized skin redness, hives, and swelling of the mouth, face, and neck. Epinephrine should only administered to patients having symptoms suggestive of an acute systemic reaction (i.e. generalized skin rash, difficulty breathing, fainting, or facial swelling).

WILDERNESS MEDICAL PROTOCOL

Emergency administration of epinephrine for anaphylaxis:

1. *Maintain an open airway, assist ventilations if necessary, and put patient in a position of comfort. Initiate CPR if necessary.*
2. *Inject 0.3 mg of 1/1000 epinephrine into the vastus lateralis muscle, or the anterior aspect of the thigh (intramuscular is recommended, however subcutaneous is acceptable).**
3. *Repeat injections every 5 minutes if condition worsens or every 15 minutes if condition does not improve, for a total of up to three doses.*
4. *Administer 50-100 mg of diphenhydramine by mouth every 4-6 hours if the patient is awake and can swallow.*
5. *Consider Prednisone 40 – 60 mg / day (or equivalent dose of an oral corticosteroid).*
6. *Because a rebound reaction can occur, all victims of an anaphylactic reaction should be evacuated. Rebound reactions should be treated in the same manner as the initial reaction, using epinephrine in the same dosage.*

* There is 1mg of epinephrine in 1 mL of epinephrine 1/1000; there are 0.3 mg in 0.3 mL of 1/1000. Preloaded commercially available injectors deliver either 0.3 mg (standard adult dose) or 0.15 mg (standard pediatric dose). If the person weighs less than 66 lbs. (30 kg), the doses are: epinephrine is 0.01 mg/kg; diphenhydramine is 1mg/kg; and prednisone is 1 - 2mg/kg. When using lbs., multiply the weight times 0.45 to get the weight/mass in kilograms.

Note to consulting physician: *the organization will need a prescription from you to obtain injectable epinephrine. It is available in the following forms: Twinjects, Epi-Pens® and manual injection methods. Over the counter diphenhydramine should always be carried in addition to injectable epinephrine.*

Visit www.wildsafe.org/protocols for the complete wilderness medical field protocol for anaphylaxis and other wilderness medical protocols.

ROUTES OF ADMINISTRATION

The subcutaneous is the preferred route of administration of epinephrine by vial or ampule. If given intramuscularly (as with an epinephrine auto-injector such as an EpiPen), injection into the buttocks should be avoided as it has been proven nearly ineffective compared to administration to the lateral thigh **ONLY**. If administering epinephrine by vial or ampule, it is also recommended to do so **ONLY** subcutaneously on the lateral thigh, and **NOT** the arm if possible.

INJECTION LOCATION

It has been shown that intramuscular (IM) injection of epinephrine into the lateral thigh (using a 1 or 1½ inch needle such as an EpiPen) results in the fastest and most effective reduction of swelling in the airway. The rate at which epinephrine levels in the blood peak when administered via IM injection to the upper arm is significantly slower than when administered to the thigh, and should be only used as an alternative injection site. Subcutaneous (SC) injection (regardless of injection site) has been shown to have significantly delayed absorption rates of epinephrine into the bloodstream as compared to IM injection into the thigh. Avoid any injections to the buttocks, as this method has been rendered ineffective in a life-threatening situation.

CONTRAINDICATIONS

Although there are no contraindications stated for the use of epinephrine **for anaphylaxis**, epinephrine is not recommended for patients who are in labor or suffer from coronary insufficiency (angina).

ADMINISTRATION OF EPINEPHRINE BY SYRINGE

1. Take proper **scene safety & body substance isolation** precautions such as donning non-latex gloves.
2. Inspect the medication vial to ensure that it is **not discolored or cloudy**. Epinephrine should be clear like water.
3. Check the label and **expiration date** of the medication. **Do NOT use expired or discolored epinephrine.**
4. Select a **sterile syringe** with a proper gauge needle. A *25 gauge* needle is recommended for adults.
 - **AMPULES**
 - If using a glass ampule, carefully break off the tip and hold the ampule upside down at a 45° angle.
 - Insert the syringe carefully into the liquid and slowly pull back on the plunger, pulling out slightly more epinephrine than required (.3 - .5 ml).
 - Remove needle from ampule and expel any air from the syringe.
 - **VIALS**
 - If using a vial, wipe the top of the bottle (the rubber) with an alcohol swab.
 - Draw air into the syringe, equal to or slightly greater than the volume of epinephrine required.
 - Turn the vial upside down and insert the syringe into the rubber top.
 - Insert the air of the syringe into the vial by pushing the plunger until it is completely empty.
 - Slowly pull the plunger back to the same level that it was filled with air moments ago.
 - Remove needle from bottle and expel any air from the syringe.
5. **Clean** the injection site (the patient's **lateral thigh**) with an alcohol wipe.
6. Using a "**darting action**", insert the needle directly into the subcutaneous tissue of the skin and **slowly** push the plunger all the way down until the syringe is empty. Remove the needle and dispose properly. If bleeding should occur, apply triple-antibiotic ointment and place a Band-Aid over the site.
7. **Record** the event (date, time, & location of injection) in your patient documentation or incident report.

ADMINISTRATION OF EPINEPHRINE BY AUTO-INJECTOR

1. Take proper **scene safety & body substance isolation** precautions such as donning non-latex gloves.
2. Inspect the auto-injector to ensure that it is **not discolored or cloudy**. Epinephrine should be clear like water.
3. Check the label and **expiration date** of the auto-injector. **Do NOT use expired or discolored epinephrine.**
4. Ensure that the auto-injector is the **correct dose** (adult or pediatric).
 - **ADULT auto-injectors:** contain 0.3 mg; given to patients weighing 66 lbs. or greater; up to but not more than 3 doses may be administered 5-10 minutes apart within one hour. **ADULT Epipen** holsters have either a **YELLOW** or **BLUE** cap; **ADULT Twinjects** have a **BLUE** holster & label.
 - **Pediatric Epipen:** contains 0.15 mg; given to patients weighing 33-66 lbs.; up to but not more than 3 doses may be administered 5-10 minutes apart within one hour. **PEDIATRIC Epipen** holsters have a **GREEN** cap; **PEDIATRIC Twinject** holsters and label are **GREEN**.
 - Beware of **generic** Epipens and Twinjects which may not be color-coded. **Always check the dose!**
5. Prepare the auto-injector for use and administer as soon as possible:
 - **EPIPENS**
 - With one hand, hold the Epipen with the black- or orange-tipped end facing the ground.
 - Do NOT cover either end of the device with your thumb. Instead, make a fist.
 - Remove the grey or blue safety release (opposite end of the colored tip). The Epipen is now armed.
 - Push the Epipen into the outside of the **thigh** and hold it there for **10 seconds**.
 - Remove the Epipen and place back into its holster; or if an orange cap has appeared, this is a needle protection device and the Epipen is no longer a sharps issue. It is still however, a biohazard!
 - Dispose of the device properly.
 - **If symptoms have not improved within 5-10 minutes** after the initial injection, administer a second Epipen as needed.
 - **TWINJECTS**
 - With one hand, hold the Twinject with the round end that says "PULL 1" facing the ground.
 - Do NOT cover either end of the device with your thumb. Instead, make a fist.
 - Remove the plastic cover labeled "**PULL 1**", revealing a red injector tip.
 - Now remove green end cap labeled "**2**". The Twinject is now armed.
 - Push the Twinject into the outside of the **thigh** and hold it there for **10 seconds**.
 - Remove the Epipen and place back into its holster. If an orange cap has appeared, this is a needle protection device and the Epipen is no longer a sharps issue.
 - **If symptoms have not improved** within 5-10 minutes after the initial injection, administer a second dose as needed:
 - Unscrew the red tip (be careful of the needle).
 - Pull syringe from barrel and slide yellow collar off plunger.
 - Put the needle into the thigh (not in the same exact location) and push the plunger all the way down.
 - Dispose of the device properly.
6. **Record** the event (date, time, & location of injection) in your patient documentation or incident report.