

Asthma



Note: The instructions for administering asthma medication found in this chapter should not be substituted for those given by a medical professional to an individual person. Nor should these instructions be substituted for directions given by a medical professional in consultation with a site where asthma medication will be administered. Consult a health care professional for specific advice on the use of asthma inhalers and nebulizers.

Asthma is a life-long lung disease. It affects millions of adults and children in the United States. Cases of severe asthma and deaths from asthma are increasing. As a first aid responder, there is a good chance that you could be asked to help a person with a breathing emergency caused by asthma.

In this chapter, you will read about how to identify the signals of an asthma attack. This chapter also covers how to give care to a person having an asthma attack, which includes helping the person to use an inhaler to administer quick-relief medications.

ASTHMA

Asthma is an illness in which certain substances or conditions, called “triggers,” cause inflammation and constriction of the *airways* (small tubes in the lungs through which we breathe), making breathing difficult. Triggers of an asthma attack include exercise, cold air, allergens or irritants, such as perfume.

In 2008, the Centers for Disease Control and Prevention (CDC) estimated that over 23 million Americans were affected by asthma. Asthma is more common in children and young adults. However, its frequency and severity is increasing in all age groups in the United States. Asthma is the third-ranking cause of hospitalization among those younger than 15 years.

People diagnosed with asthma can reduce the risk of an attack by controlling environmental variables when possible. This helps to limit exposure to the triggers that can start an asthma attack.

When an attack does occur, they can use medications and other forms of treatment. Asthma medications stop the muscle spasm and open the airway, which makes breathing easier.

Asthma Triggers

A trigger is anything that sets off or starts an asthma attack. A trigger for one person is not necessarily a trigger for another. Asthma triggers include the following:

- Dust and smoke
- Air pollution
- Respiratory infections
- Fear or anxiety
- Perfume
- Exercise
- Plants and molds
- Medications, such as aspirin
- Animal dander
- Temperature extremes
- Changes in weather

These are only a few of the things that can trigger asthma in people.

Preventing Asthma Attacks

Prevention is key. A person can follow these preventative measures to reduce his or her risk of an attack:

- Limit triggers in the home.
- Control emotions.

- Prevent infections.
- Reduce environmental triggers.
- Exercise carefully.

Limiting Triggers in the Home

You can reduce the chances of triggering an asthma attack at home by:

- Keeping plants outside.
- Washing bedclothes and pajamas weekly in hot water.
- Using hypoallergenic covers on mattresses and pillows.
- Eliminating or reducing the number of carpets and rugs.
- Regularly steam cleaning all carpets, rugs and upholstery.
- Keeping the home clean and free of dust and pests—wet dusting can be more effective than dry dusting.
- Not allowing, or being around, smoke.
- Regularly changing the air filter in the central air conditioning or heating unit.
- Eliminating or minimizing the number of stuffed toys.
- Using hypoallergenic health and beauty products.
- Washing pets weekly.
- Keeping pets outside of the house.

Controlling Emotions

Certain strong emotions can trigger an asthma attack. When you feel a strong emotion, such as anger or fear, the following suggestions can reduce the chances that the emotions will trigger an asthma attack:

- Take a long deep breath in through the nose and slowly let it out through the mouth.
- Count to 10.
- Talk with a family member, trusted friend or health care provider.
- Do a relaxing activity.

Preventing Infections

Colds and other respiratory infections can make an asthma condition worse. One of the most common ways to catch colds is by rubbing the nose or eyes with hands contaminated with a cold virus. Contamination often occurs by touching surfaces (such as doorknobs) or objects that other people have touched.

Some ways to reduce the chances of getting a cold or other respiratory infection include:

- Washing hands regularly, especially after using the restroom or shaking hands with other people and before eating.

- Cleaning environmental surfaces, such as telephones and counters, with a virus-killing disinfectant. The viruses that cause colds can survive up to 3 hours on objects such as telephones, counters and stair railings. Disinfecting them regularly can help to prevent the spread of colds and viruses.
- Getting vaccinated for illnesses when a vaccine is available, such as for influenza and whooping cough (pertussis).

Your health care provider might have other suggestions based on your medical history.

Reducing Environmental Triggers

Sudden changes in the weather, heavy mold or pollen content in the air and pollution can trigger an asthma attack. To avoid attacks brought on by triggers in the environment:

- Wear the right clothing for the weather conditions.
- Stay indoors on days when there is a high risk of respiratory trouble.
- Take preventative medications, as prescribed by your health care provider.
- Stay away from places with high amounts of dirt, smoke and other irritants.
- Know how the weather affects your condition.
- Talk to your health care provider about other prevention strategies.

Exercising Carefully

Exercise-induced asthma happens during or shortly after exercise. Having this type of asthma does not mean one cannot or should not exercise or play sports. It is, however, important to know what to do to prevent an asthma attack. Things to keep in mind when you have exercise-induced asthma include the following:

- Take prescribed medications 30 to 60 minutes before exercising.
- Slowly warm up before exercising. Cool down gently after exercising.
- Make sure that you drink plenty of fluids during exercise.
- Seek and follow the advice of your health care provider.
- If participating in organized sports, notify the coach of your condition.

Using Medications to Control Asthma

People who have been diagnosed with asthma will have a personalized medication plan. They should take all medications exactly as prescribed by their health care provider.

Asthma medications are available in two forms: long-term control and quick relief.

Long-Term Control Medications

Long-term control medications prevent or reverse *inflammation* (swelling) in the airway. They also help to decrease sensitivity, which helps to keep the airways from reacting to asthma triggers.

The long-term control medicines work slowly. They help to control asthma over many hours. They should be taken every day whether or not signals of asthma are present.

Quick-Relief Medications

Quick-relief or rescue medications are used to stop an asthma attack. These medications work quickly to relieve the sudden swelling. They lessen wheezing, coughing and chest tightness. This allows the person to breathe easier. They also are called *short-acting bronchodilators*.

Methods of Delivery

The most common way to take long-term control and quick-relief asthma medications is by inhaling them. Inhalation allows the medication to reach the airways faster and work quickly. There also are fewer side effects.

Medications are inhaled using a metered dose inhaler (MDI), a dry powder inhaler (DPI) or a small-volume nebulizer (Fig. 10-1). Both long-term and quick-relief medications also are available in pill and liquid form. In addition, long-term medications are available in the form of an injection given just under the skin.



FIGURE 10-1 Long-term and quick-release medications are inhaled using an MDI, a DPI or a small-volume nebulizer.

MDI

An MDI sends a measured dose of medicine in mist form directly into the person's mouth. The person gently presses down the top of the inhaler. This causes a small amount of pressurized gas to push the medicine out quickly. Sometimes a "spacer" is used to control the amount of medication that is inhaled. The medicine goes into the spacer and then the person inhales the medication through the mouthpiece on the spacer.

DPI

A DPI is similar to an MDI. It is a hand-held device that delivers a dry powder form of the medication. Some dry powders are tasteless. Others are mixed with lactose to give them a sweet taste. The DPI is administered by breathing in quickly to activate the inhaler. The person does not have to press down the top of the inhaler. DPIs may be difficult for some people to use because of the need to take in a quick, strong breath.

Small-Volume Nebulizers

Small-volume nebulizers deliver medication in the form of a mist. The mist is delivered over several minutes. This is especially helpful when the person is unable to take deep breaths. Nebulizers are commonly used for children younger than 5 years and the elderly. They also are used for people who have trouble using inhalers and for those with severe asthma.

What to Look For

You often can tell when a person is having an asthma attack by the hoarse whistling sound made while exhaling. This sound, known as *wheezing*, occurs because air becomes trapped in the lungs. Coughing after exercise, crying or laughing are other signals that an asthma attack could begin.

Signals of an asthma attack include:

- Trouble breathing or shortness of breath.
- Rapid, shallow breathing.
- Sweating.
- Tightness in the chest.
- Inability to talk without stopping for a breath.
- Feelings of fear or confusion.



FIGURE 10-2 To assist a person having an asthma attack, remain calm and help the person to sit comfortably.

When to Call 9-1-1

Call 9-1-1 or the local emergency number if the person's breathing trouble does not improve in a few minutes after using the quick-relief medication.

What to Do Until Help Arrives

Remain calm. This will help the person to remain calm and ease breathing troubles. Help the person to sit comfortably (Fig. 10-2). Loosen any tight clothing around the neck and abdomen. Assist the person with his or her prescribed quick-relief medication if requested and if permitted by state or local regulations.

PUTTING IT ALL TOGETHER

Asthma is a life-long lung disease that affects millions of adults and children in the United States. Asthma can be controlled. Knowing the triggers for asthma and how to limit those triggers, and taking prescribed medications as directed can help to prevent an asthma attack.

It is important to be prepared to help people with breathing emergencies caused by asthma. The first step is to know the signals of an asthma attack. When you recognize the signals, act quickly and give appropriate care. Your care could help to save the life of a person with asthma.

ASSISTING WITH AN ASTHMA INHALER

TIP: Always obtain consent and wash your hands immediately after giving care. Read and follow all instructions printed on the inhaler prior to administering the medication to the person.

IF THE PERSON HAS MEDICATION FOR ASTHMA, HELP HIM OR HER TAKE IT IF ASKED:

1 HELP PERSON SIT UP

Help the person sit up and rest in a position comfortable for breathing.

2 CHECK PRESCRIPTION

- Ensure that the prescription is in the person's name and is prescribed for "quick relief" or "acute" attacks.
- Ensure that the expiration date has not passed.



3 SHAKE INHALER

4 REMOVE MOUTHPIECE COVER

If an extension tube (spacer) is available, attach and use it.



5 INSTRUCT PERSON TO BREATHE OUT

Tell the person to breathe out as much as possible through the mouth.

TIP: The person may use different techniques, such as holding the inhaler two-finger lengths away from the mouth.

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6 ADMINISTER MEDICATION

Have the person place his or her lips tightly around the mouthpiece and take a long, slow breath.

- As the person breathes in slowly, administer the medication by quickly pressing down on the inhaler canister, or the person may self-administer the medication.
- The person should continue a full, deep breath.
- Tell the person to try to hold his or her breath for a count of **10**.
- When using an extension tube (spacer) have the person take **5** to **6** deep breaths through the tube without holding his or her breath.

**7 RECORD TIME OF ADMINISTRATION**

- Note the time of administration and any change in the person's condition.
- The medication may be repeated once after **1** to **2** minutes.

8 HAVE PERSON RINSE MOUTH

Have the person rinse his or her mouth out with water to reduce side effects.

- Stay with the person and monitor his or her condition and give **CARE** for any other conditions.

**9 CARE FOR SHOCK**

Care for shock.

- Keep the person from getting chilled or overheated.
- **CALL 9-1-1** or the local emergency number if trouble breathing does not improve quickly.

TIP: These medications might take **5** to **15** minutes to reach full effectiveness. Follow label instructions regarding additional doses of the medication.

Anaphylaxis and Epinephrine Auto-Injectors



Note: The instructions in this chapter are not a substitute for the directions given by a medical professional to an individual person. Nor should these instructions be substituted for directions given by a medical professional in consultation with a site where epinephrine auto-injectors will be used. Consult a health care professional for specific advice on the use of epinephrine auto-injectors.

A severe allergic reaction can bring on a condition called *anaphylaxis*, also known as *anaphylactic shock*. Anaphylaxis can quickly cause trouble breathing. It is a life-threatening emergency that must be recognized and cared for immediately.

In this chapter you will learn to identify the signals of anaphylaxis. You also will learn what care to give to a person in anaphylactic shock. Part of giving care may mean helping the person use an epinephrine auto-injector.

ANAPHYLAXIS

Every year in the United States, between 400 and 800 deaths are caused by anaphylaxis. Respond quickly if a person is exposed to an *antigen*—a foreign substance that brings on an allergic reaction. Fortunately, some deaths can be prevented if anaphylaxis is recognized immediately and cared for quickly.

Allergic Reactions

Allergic reactions are caused by the activity of the *immune system*. The body recognizes and protects itself from antigens by producing *antibodies*. These antibodies fight antigens. Antibodies are found in the liver, bone marrow, spleen and lymph glands. When the immune system recognizes an antigen, it releases chemicals to fight these foreign substances and eliminate them from the body.

Antigens that cause an allergic reaction—are called *allergens*. Allergic reactions range from mild to very severe. A common mild reaction is skin irritation from contact with poison ivy. A severe, life-threatening reaction is swelling of the airway, trouble breathing and an obstructed airway.

Some common allergens include bee or insect venom, certain antibiotics, pollen, animal dander and sulfa drugs.

Over 12 million people in the United States have food allergies. Every year there are over 30,000 cases of food-related anaphylaxis. Certain types of food commonly cause an allergic reaction in individuals with sensitivities to those foods. Peanuts and tree nuts cause the most cases of fatal and near-fatal allergic reactions to food. Other common food allergens include cow's milk, eggs, seafood (especially shellfish), soy and wheat.

What to Look For

Anaphylaxis usually occurs suddenly, within seconds or minutes after contact with the substance. The skin or area of the body that comes in contact with the substance usually swells and turns red (Fig. 11-1). Other signals include the following:

- Difficulty breathing, wheezing or shortness of breath
- Tight feeling in the chest and throat
- Swelling of the face, throat or tongue
- Weakness, dizziness or confusion
- Rash or hives
- Low blood pressure
- Shock

Trouble breathing can progress to a blocked airway due to swelling of the lips, tongue, throat and larynx (voice box). Low blood pressure and shock may accompany



FIGURE 11-1 In anaphylaxis, air passages can swell, restricting breathing.

these reactions. Death from anaphylaxis may happen because the person's breathing is severely restricted.

When to Call 9-1-1

Call 9-1-1 or the local emergency number if the person:

- Has trouble breathing.
- Complains of the throat tightening.
- Explains that he or she is subject to severe allergic reactions.
- Is or becomes unconscious.

What to Do Until Help Arrives

If you suspect anaphylaxis, and have called 9-1-1 or the local emergency number, follow these guidelines for giving care:

- Monitor the person's breathing and for changes in his or her condition.
- Give care for life-threatening emergencies.
- Check a conscious person to determine:
 - The substance (antigen) involved.
 - The route of exposure to the antigen.
 - The effects of the exposure.

If the person is conscious and is able to talk, ask:

- What is your name?
- What happened?
- How do you feel?
- Do you feel any tingling in your hands, feet or lips?
- Do you feel pain anywhere?
- Do you have any allergies? Do you have prescribed medications to take in case of an allergic reaction?
- Do you know what triggered the reaction?

- How much and how long were you exposed?
- Do you have any medical conditions or are you taking any medications?

Quickly check the person from head to toe. Visually inspect the body:

- Observe for signals of anaphylaxis including respiratory distress.
- Look for a medical identification (ID) tag, bracelet or necklace.

Check the person's head.

- Look for swelling of the face, neck or tongue.
- Notice if the person is drowsy, not alert, confused or exhibiting slurred speech.

Check skin appearance. Look at person's face and lips. Ask yourself, is the skin:

- Cold or hot?
- Unusually wet or dry?
- Pale, ashen, bluish or flushed?

Check the person's breathing.

- Ask if he or she is experiencing pain during breathing.
- Notice rate, depth of breaths, wheezes or gasping sounds.

Care for respiratory distress.

- Help the person to rest in the most comfortable position for breathing, usually sitting.
- Calm and reassure the person.
- Assist the person with using a prescribed epinephrine auto-injector, if available and if permitted by state regulations.
- Document any changes in the person's condition over time.

Assisting with an Epinephrine Auto-Injector

People who know they are extremely allergic to certain substances usually try to avoid them. However, sometimes this is impossible. These people may carry an anaphylaxis kit in case of a severe allergic reaction.

These kits are available by prescription only. They contain a dose (or two) of the drug *epinephrine*. This drug works in the body to counteract the anaphylactic reaction. Two injectable epinephrine systems are available: the *Epi-Pen®*, which includes one dose; and *Twinject®*, which includes two doses (Fig. 11-2, A–B). The instructions provided by the manufacturer and health care provider always

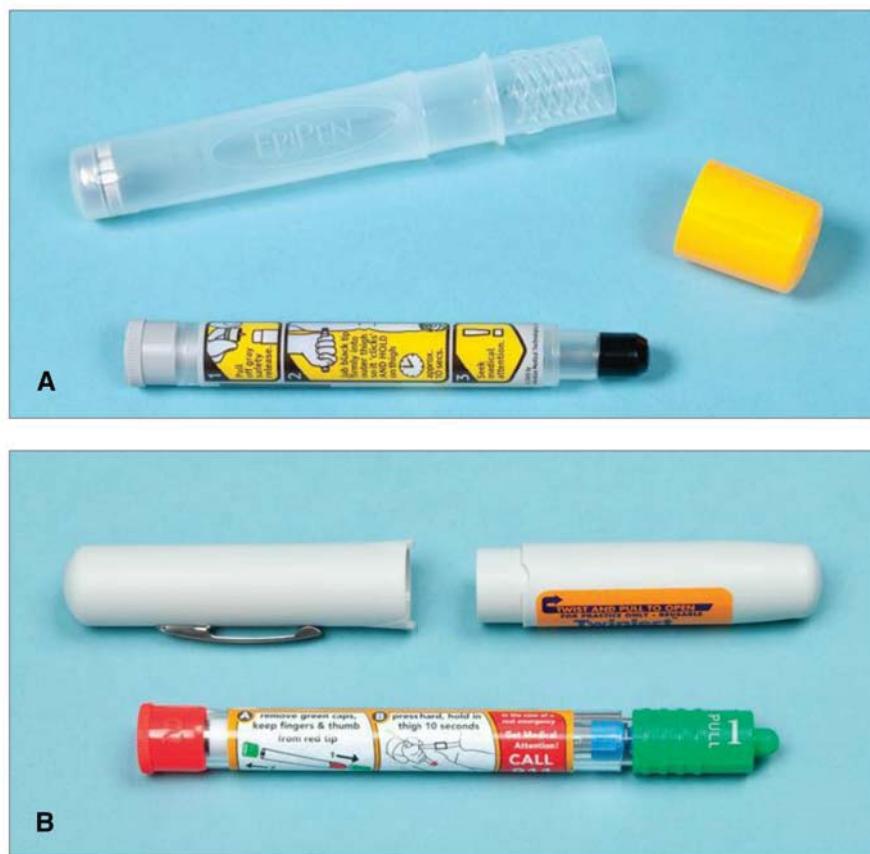


FIGURE 11-2, A–B A, An Epi-Pen® is preloaded with a single dose of the drug epinephrine. B, A Twinject® is preloaded with a double dose of epinephrine.

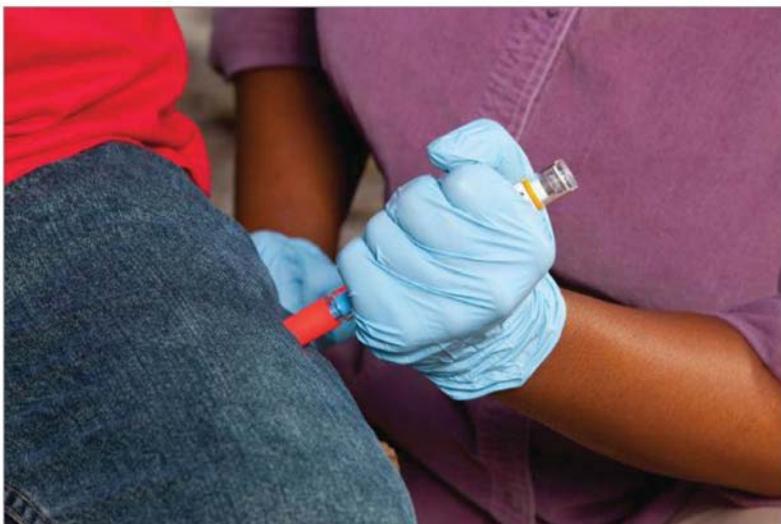


FIGURE 11-3 *Forcefully pushing the auto-injector against the skin activates the device. It should be used on a muscular area, usually the person's mid-outer thigh.*

should be followed when assisting someone with their prescribed epinephrine auto-injector. A second dose should not be given unless recommended by advanced medical personnel or in extremely unusual circumstances, where advanced medical care is not available or is significantly delayed and signals of anaphylaxis persist after a few minutes.

Note: Only the person having the reaction should self-administer the second dose included with the Twinject® injector.

An auto-injector contains a preloaded dose of 0.3 mg of epinephrine for adults or 0.15 mg of epinephrine for children weighing 33 to 66 pounds. The injector has a spring-loaded plunger. When activated, it injects the epinephrine. The auto-injector is activated when it is forcefully pushed against the skin.

It should be used on a muscular area, usually the person's mid-outer thigh (Fig. 11-3). The injector needs to stay in place for 10 seconds. This allows the medication to fully empty. When the auto-injector is removed, handle it carefully and do not touch the needle if it is exposed.

If a person is conscious and able to use the auto-injector, help him or her in any way asked. If you know that a person has a prescribed auto-injector and is unable to administer it him- or herself, then you may help the person use it where allowed by state or local laws or regulations. Remember, for a person experiencing anaphylaxis, time is of the essence.

Helping the Person Self-Administer an Antihistamine

Some anaphylaxis kits also contain an *antihistamine* in pill form. An antihistamine is a type of medication. It lessens the effects of compounds released by the body during an allergic reaction.

The person should read and follow all medication labels. It also is important for the person to follow any instructions given by the health care provider. Check state and local regulations about assisting someone with the use of prescription and over-the-counter medications.

PUTTING IT ALL TOGETHER

Anaphylaxis is a life-threatening emergency. Knowing how to give immediate care and help someone use an epinephrine auto-injector could mean the difference between life and death.

ASSISTING WITH AN EPINEPHRINE AUTO-INJECTOR

Determine whether the person has already taken epinephrine or antihistamine. If so, administer a second dose only when EMS personnel are not present or delayed and if signals of anaphylaxis persist after a few minutes. Check the label to confirm that the prescription of the auto-injector is for this person.

Check the expiration date of the auto-injector. If it has expired, DO NOT USE IT. If the medication is visible, confirm that the liquid is clear and not cloudy. If it is cloudy, DO NOT USE IT.

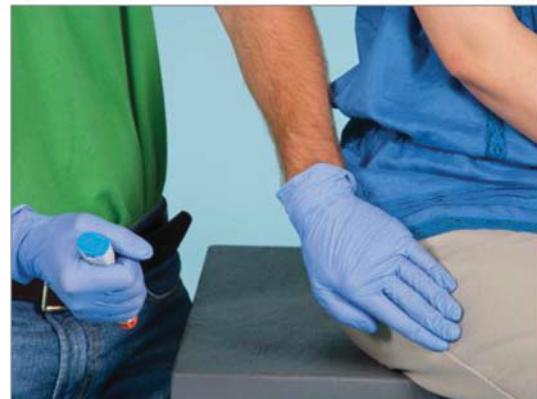
NOTE: If possible, help the person self-administer the auto-injector.

TO CARE FOR A CONSCIOUS PERSON WHO IS UNABLE TO SELF-ADMINISTER THE AUTO-INJECTOR, AND LOCAL OR STATE REGULATIONS ALLOW:

1 LOCATE INJECTION SITE

Locate the outside middle of one thigh to use as the injection site.

NOTE: If injecting through clothing, press on the area with a hand to determine that there are no obstructions at the injection site, such as keys, coins, the side seam of trousers, etc.



2 REMOVE SAFETY CAP

Grasp the auto-injector firmly in your fist, and pull off the safety cap with your other hand.



3 POSITION AUTO-INJECTOR

Hold the tip (needle end) near the patient's outer thigh so that the auto-injector is at a 90-degree angle to the thigh.

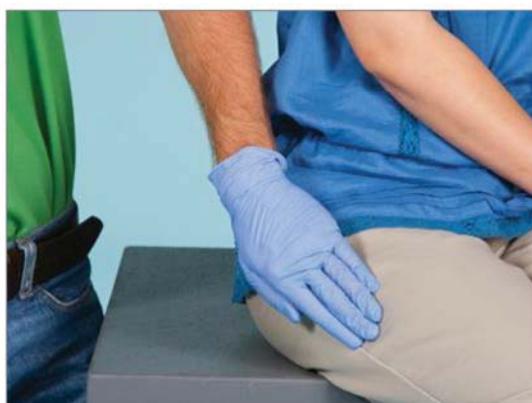
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4 ADMINISTER INJECTION

Quickly and firmly push the tip straight into the outer thigh. You will hear a click.

**5 HOLD IN PLACE**

Hold the auto-injector firmly in place for **10 seconds**, then remove it from the thigh and massage the injection site with a gloved hand for several seconds.

**6 RECHECK BREATHING**

Recheck the person's breathing and observe his or her response to the medication.

7 HANDLE USED AUTO-INJECTOR CAREFULLY

Handle the used auto-injector carefully, placing it in a safe container. Give it to EMS personnel when they arrive.

