

Use and Administration of Epinephrine Auto-Injectors



AMERICAN SAFETY & HEALTH INSTITUTE

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Use and Administration of Epinephrine Auto-Injectors Student Book, Version 8.0

Purpose of this Student Book

This ASHI *Use and Administration of Epinephrine Auto-Injectors Version 8.0 Student Book* is solely intended to give information on the presentation and administration of ASHI Use and Administration of Epinephrine Auto-Injectors certified training classes. The information in this book is furnished for that purpose and is subject to change without notice.

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Making the Workplace and Community Safer.

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Anaphylaxis and Epinephrine



Anaphylaxis is a serious, rapidly developing, life-threatening condition. A person's likelihood of survival is greatly enhanced by the early administration of epinephrine.

In this class, you will learn about causes of severe allergic reaction, how to recognize and treat anaphylaxis, legal considerations for administering epinephrine, and how to prepare for an anaphylactic emergency.

Anaphylaxis

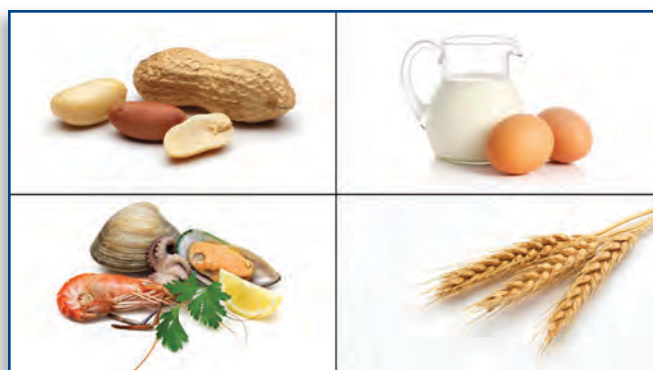
Anaphylaxis is a severe allergic reaction by the body's immune system. This fast-developing reaction affects the entire body and can quickly result in life-threatening symptoms.

A person must be exposed to something he or she is sensitive to in order to have an anaphylactic reaction. These causes, or triggers, are known as allergens.

Allergens can enter the body through ingestion, injection, skin absorption, or inhalation.

These foods and food groups account for 90% of severe allergic reactions:¹

- Milk
- Eggs
- Fish
- Crustacean shellfish
- Wheat
- Soy
- Peanuts
- Tree nuts



Thousands of people are stung by insects each year, and as many as 90 to 100 people in North America die each year as a result of anaphylaxis from insect stings.²

Medications, such as penicillin and aspirin, can cause severe allergic reactions.

Latex, often used in disposable gloves or other manufactured products, is also a common cause of severe allergic reaction, especially if someone has had frequent exposure to it.

Someone who has had a severe allergic reaction in the past is likely to have another reaction when exposed to the same allergen.

A severe allergic reaction can develop rapidly. In general, the faster the reaction occurs, the more severe it is. Without treatment, death can occur within minutes.³

Epinephrine

Epinephrine, also known as adrenaline, is a hormone secreted by the adrenal glands in the human body. As an injectable medication, epinephrine can quickly counter the life-threatening symptoms of anaphylaxis and provide more time to treat the underlying cause.

Because of the speed of an anaphylactic reaction, the administration of epinephrine by a lay bystander may be the only opportunity to save a person's life.⁴

Epinephrine Auto-Injectors

Epinephrine auto-injectors are simple-to-use medical devices that allow individuals with minimal training to administer epinephrine quickly in an emergency. Auto-injectors automatically inject epinephrine through a spring-loaded needle when pressed firmly against the skin.

Individuals who have experienced a serious allergic reaction or are at risk for one are typically prescribed epinephrine auto-injectors to carry and use. In addition, epinephrine auto-injectors are available for use by certain trained lay providers in situations where anaphylactic reactions may occur more frequently, such as by teachers in schools, or by lay providers in remote areas that have longer EMS response times.

Barriers for Use

Most epinephrine auto-injectors are prescribed for self-administration during a life-threatening anaphylactic emergency. However, many of those who are prescribed auto-injectors do not carry them consistently.

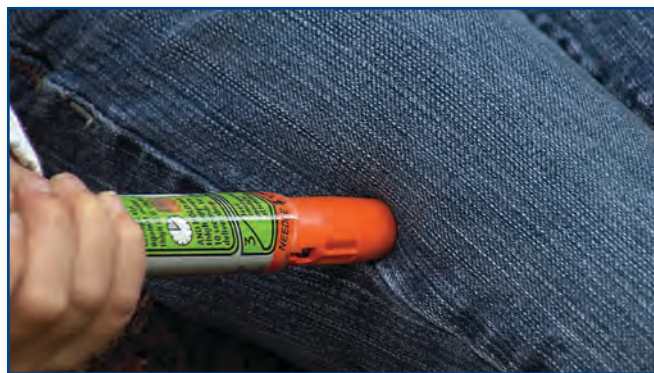
Anyone with a prescribed epinephrine auto-injector should have it nearby at all times, especially when there is a higher risk for exposure to a known allergen.

Even when an epinephrine auto-injector is available, there is often hesitation to use it. Common reasons for hesitation include the following:⁵

- Failure to recognize the symptoms of anaphylaxis
- Uncertainty about how and when to use an auto-injector
- Belief that EMS professionals can provide timely care
- Fear of making things worse

Not carrying an epinephrine auto-injector, or hesitating to use or administer one, is dangerous. It is the only early treatment available to save a life in an anaphylactic emergency.⁶

Many people don't yet realize they are severely allergic. For example, about 25% of anaphylactic reactions at schools occur in students previously undiagnosed.⁷



Legal Considerations

Federal law allows elementary and secondary schools in the United States to train personnel to administer epinephrine to a student suffering a life-threatening anaphylactic emergency.⁸ As a result, the majority of states now have regulations that allow or require schools to have epinephrine auto-injectors and to train school personnel on how to administer them.⁹

In addition to school personnel, several states have regulations that allow certain trained laypeople to administer epinephrine in a remote setting. This includes individuals such as law enforcement, outdoor camp staff, wilderness guides, and forest workers.

These regulations also provide Good Samaritan protection for trained lay providers and the organizations providing the emergency assistance.



Knowledge Check

True or false? Early use of epinephrine in an anaphylactic emergency quickly reverses life-threatening symptoms, buying time for the body and other medications to control the underlying problems.

Recognition and Response



Early recognition of the signs and symptoms of anaphylaxis and immediate treatment for it are essential for survival.

Signs and Symptoms

An affected person may experience swelling of the lips, eyelids, or face. Itchy raised red lumps, or hives, can appear on the face and chest. Blood vessels dilate in anaphylaxis, causing blood pressure to drop. Skin can become pale, cool, and moist to the touch. The person may also complain of nausea and abdominal cramping.

The most worrisome development is swelling of the soft tissue in the throat that constricts the air passage to the lungs. This can result in hoarseness, coughing, wheezing, difficulty swallowing, difficulty in taking a breath, or the loss of breathing altogether.

The first signs of a reaction may be mild, but symptoms can worsen rapidly.

Treatment

If you suspect someone is having an anaphylactic reaction, treat it immediately. The treatment for anaphylaxis is the prompt use of epinephrine. As an injectable medication, epinephrine constricts blood vessels to increase blood pressure, relaxes smooth muscles in the lungs to improve breathing, stimulates the heart, and helps reduce swelling and hives.¹⁰

If the person affected has an epinephrine auto-injector available, assist the person in using it on him- or herself. If the person cannot self-administer the epinephrine or does not have it, immediately administer it yourself if state law allows you to do so.



The EpiPen epinephrine auto-injector is a commonly used delivery device available in 2 dosages, one for individuals above 66 pounds and one for those between 33 and 66 pounds.

The Epinephrine Injection, USP auto-injector is another device designed to provide the delivery of epinephrine for a severe allergic reaction. It is available in 2 dosages, one for individuals above 66 pounds and one for those between 33 and 66 pounds. The steps for use are the same for both the brand name and generic versions.

Stay with the person. Make sure EMS has been activated by calling an easy-to-remember emergency number, such as 911. Epinephrine is only a short-term solution to relieve life-threatening symptoms. Additional emergency treatment is required.

It is common for someone who has severe allergic reactions to carry oral antihistamine medication. If there is no difficulty in swallowing, assist the person in taking it.

Allow the person to find the most comfortable position in which to breathe. Loosen any tight clothing. Calm, comfort, and reassure the person.

A single dose of epinephrine may not relieve the symptoms. The beneficial effect of epinephrine can also wear off over time. Consider a second dose if the underlying condition is still present or symptoms return and EMS is still 5 to 10 minutes away.

An epinephrine auto-injector is a single-use device. Use of a second auto-injector will be necessary to deliver a second dose. Never administer more than 2 doses. Do not administer a second dose at the same site as the first.

Give used auto-injectors to EMS providers or other healthcare professionals for proper disposal. Do not throw them away in a regular trash container.



Knowledge Check

You are in a remote location when a coworker gets stung by a bee. Within a few minutes her face has swollen and she is struggling to breathe. She has a prescribed epinephrine auto-injector with her, but she is unable to use it on herself. What should you do?

Using an EpiPen Auto-Injector



Prepare EpiPen

- Remove EpiPen from its storage container.
- Never put thumb, fingers, or hand over orange tip.
- Form a fist around auto-injector with the orange tip pointing downward and pull off blue safety release cap.



Administer Epinephrine

- Position EpiPen near middle of person's outer thigh.
- Swing and firmly push orange tip at a 90-degree angle against thigh so it clicks.
- For a child, hold the leg to prevent movement prior to and during injection.
- Hold device firmly on thigh for approximately 3 seconds to deliver epinephrine.



Remove EpiPen

- Pull device straight out.
- The needle will retract underneath safety cap.
- Firmly massage injection area for about 10 seconds.



Following Administration

- Activate EMS by calling 911, if not already done.
- Consider giving a second dose with a new EpiPen if symptoms persist and EMS is still 5–10 minutes away.
- Carefully place used EpiPen somewhere safe. Give to EMS providers for proper disposal. Do not throw away in a regular trash container.

Using an Epinephrine Injection, USP Auto-Injector



Prepare Epinephrine Auto-injector

- Remove auto-injector from storage container.
- Pull off both end caps to reveal red tip. Never put your thumb, fingers, or hand over red tip.
- Form a fist around auto-injector with the red tip pointing downward.



Administer Epinephrine

- Put red tip of auto-injector against middle of person's outer thigh.
- Firmly push tip in at 90-degree angle.
- For a child, hold the leg to prevent movement prior to and during injection.
- Hold device firmly on thigh for approximately 10 seconds to deliver epinephrine.



Remove Epinephrine Auto-Injector

- Pull auto-injector straight out.
- Check the red tip. If needle is exposed, epinephrine was delivered. If needle is not visible, attempt to deliver epinephrine again.
- Firmly massage injection area for about 10 seconds.



Following Administration

- Activate EMS by calling 911, if not already done.
- Consider giving second dose with new epinephrine auto-injector if symptoms persist and EMS is still 5–10 minutes away.
- Carefully place used devices needle-first into storage container. Give to EMS providers for proper disposal. Do not throw away in a regular trash container.

Planning and Preparation



Storage

An epinephrine auto-injector should be stored at room temperature. Do not refrigerate an auto-injector or expose it to extreme heat or light.

Inspection

Be prepared to administer a second dose of epinephrine by having 2 auto-injectors available at all times.

An epinephrine auto-injector has an expiration date, usually printed on the side of the injector. The effectiveness of the dose may decrease after the expiration date. Refill a prescription before the expiration date. Give outdated auto-injectors to a pharmacy or a healthcare professional for proper disposal. Do not throw them away in a regular trash container.

There is a small viewing window on the side of the auto-injector. The liquid contents should appear clear. If the solution inside an auto-injector appears discolored, or contains solid particles, replace it immediately.



Preparation

Any person who may experience, or be expected to respond to, an anaphylactic emergency can take steps to prepare for one if it occurs.

- Get training in the use of epinephrine auto-injectors including, if possible, hands-on practice using a needleless training device.
- Learn about commonly used medical identification jewelry and cards, and how to recognize them. If you are at risk for anaphylaxis, carry or wear one.

In the workplace, an emergency action plan is a written document that facilitates and organizes employer and employee actions during emergencies. In the United States, it is required by Occupational Safety and Health Administration (OSHA) regulations.

An anaphylaxis emergency care plan is an individualized plan for a person at a high risk for a severe allergic reaction.

An anaphylaxis emergency care plan should be on file for each employee or student at risk for severe allergic reaction. Schools or employers must make an effort in advance to identify students, staff, employees, or clients with a history of severe allergic reactions and to take steps to be prepared to manage one.

Being prepared includes

- Having procedures on how to activate emergency medical services;
- Having an anaphylaxis emergency care plan for anyone identified to be at risk;
- Being aware of state regulations involving epinephrine auto-injector administration;
- Ensuring quick and easy access to an epinephrine auto-injector;
- Training to recognize anaphylaxis and use an epinephrine auto-injector; and
- Having procedures for properly storing and disposing of epinephrine auto-injectors.

It is strongly encouraged that anyone trained to use an epinephrine auto-injector also be trained and certified in CPR and first aid from an approved and recognized organization.

Be confident in your ability to treat anaphylaxis. Early recognition and use of an epinephrine auto-injector by a trained lay provider is likely the only way an affected person will survive.



Knowledge Check

A plan that outlines the recommended treatment for a person with a known risk for severe allergic reaction is called an _____.

Glossary

allergens

An allergen, also described as a trigger, is something a person is sensitive to that causes an allergic reaction. Allergens can enter the body through ingestion, injection, skin absorption, or inhalation. Common allergens include foods such as peanuts or shellfish, bee stings, medications such as penicillin and aspirin, and latex rubber.

anaphylaxis

Anaphylaxis is a severe allergic reaction by the body's immune system. This fast-developing reaction affects the entire body and can quickly result in life-threatening symptoms.

anaphylaxis emergency care plan

Commonly used in schools, an anaphylaxis emergency care plan is an individualized plan for a person at a high risk for a severe allergic reaction.

epinephrine

Epinephrine, also known as adrenaline, is a hormone secreted by the adrenal glands in the human body. As an injectable medication, it can quickly counter the life-threatening symptoms of anaphylaxis and provide more time to treat the underlying cause.

epinephrine auto-injector

Epinephrine auto-injectors are simple-to-use medical devices that allow individuals with minimal training to administer epinephrine quickly in an emergency.

Endnotes

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Knowledge Check Answers

Anaphylaxis and Epinephrine — *Page 3*

True. Early use of epinephrine in an anaphylactic emergency quickly reverses life-threatening symptoms and buys time for the body and other medications to control the underlying problems.

Recognition and Response — *Page 5*

If the person cannot self-administer the epinephrine, immediately administer it yourself if state law allows you to do so.

Planning and Preparation — *Page 9*

Anaphylaxis emergency care plan

Rate Your Program

This course evaluation allows you to rate the training course you have just completed. This evaluation will provide your training provider with feedback on the quality of the instruction you received.

Program Name _____ ☐ ASHI ☐ MEDIC First Aid

Instructor _____ Date of Course _____

<i>Please rate the following course elements as indicated below. Place a check in the box that best represents your opinion of the quality of each element.</i> <i>Thank you for your help.</i>	4-Excellent	3-Good	2-Average	1-Poor
Course Presentation				
Organization, pace, and flow	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Not too basic, not too complex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Time allowed for skill practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increased your confidence and ability to take action	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Instructor(s)				
Subject knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Teaching ability (clear, concise, organized)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demeanor (friendly, helpful, engaging)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Program Materials				
Video	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PowerPoint®	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student Book	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online Training Component (if taken)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Location and Equipment				
Space	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Self Assessment				
How would you rate your emergency care skills BEFORE taking this class?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How would you rate your emergency care skills AFTER taking this class?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How willing would you be to respond in an emergency BEFORE taking this class?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How willing would you be to respond in an emergency AFTER taking this class?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your overall score for the course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What did you like most about this course? _____

What did you like least about this course? _____

Would you recommend this course to others? ☐ Yes ☐ No

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