

Introduction to Epinephrine Administration Curriculum



Every effort has been made to trace the ownership of copyrighted material and to make full acknowledgement of its use. If errors or omissions have occurred, they will be corrected in subsequent editions, provided that notification is submitted in writing to the publisher.



© 2019, Realityworks, Inc. All rights reserved.
RealCare® is a registered trademark of Realityworks, Inc.

2709 Mondovi Road
Eau Claire, WI 54701 USA
800.830.1416
+1.715.830.2040
www.realityworks.com

(1054160-01)

Table of Contents

About the Author..... 4

Curriculum Structure..... 5

Lesson Structure..... 6

Lesson One – Introduction to Epinephrine Administration 7

 FOCUS: Developing Awareness of Patient-Focused Care 8

 LEARN: Epinephrine Administration Slide Presentation..... 13

 REVIEW: Practice and Assessment of Epinephrine Administration..... 15

Sources 19

About the Author



Krista Wenz has been a licensed paramedic for 34 years. She holds a bachelor's degree in Fire Safety Management and worked 23 years as a Firefighter-Paramedic for a large metropolitan fire department in California. Krista has extensive knowledge in emergency medicine, including experience as an Adjunct Instructor at community and private colleges teaching EMT and Paramedic students. She has additional experience working as a Mental Health Technician in a psychiatric ward and emergency crises, Drill Instructor, and Field Training Officer for multiple agencies, CPR, First-Aid, PALS, BLS, and ALS instructor, and EMS Captain for a rural fire department. Now retired from the fire service, Krista is passionate about passing on knowledge and experience for those interested in entering the emergency medical pre-hospital field.



Curriculum Structure

The *Introduction to Epinephrine Administration* curriculum is composed of the following lessons. Approximate lesson times are included.

Lesson	Title	Approximate Time
One	FOCUS: Developing Awareness of Patient-Focused Care	15-20 minutes
One	LEARN: Introduction to Epinephrine Administration Slide Presentation	30 minutes
One	REVIEW: Practice and Assessment of Epinephrine Administration	15-20 minutes
	Total	1 hour

Lesson Structure

Each lesson begins with a Lesson Overview, Lesson Objectives, and a Lesson at a Glance table which lists the lesson activities, materials required, suggested preparation steps, and approximate class time.

Lesson Sections

The actual lesson follows the overview, which will contain some of the sections described below.

FOCUS

Every lesson begins with a FOCUS activity intended to capture participants' attention. This may be in the form of a small or large class discussion, a game, a review of previous lesson information, or a demonstration. During this activity, participants are introduced to the topic of the lesson.

LEARN

The LEARN activity in each lesson varies in its presentation mode. It may be a slide presentation, group activity, or demonstration.

REVIEW

The majority of lessons end with a REVIEW activity intended to briefly review the lesson's key messages or main points.

Lesson One – Introduction to Epinephrine Administration

Lesson Overview

In this lesson, students will learn about proper epinephrine administration through the intramuscular route. Students will learn how to use an EpiPen® as well as how to draw up epinephrine from a vial and an ampule using the proper size needle and syringe.

Pre-Lesson Knowledge

- Basic anatomy
- Signs and symptoms of anaphylaxis
- Proper patient care and documentation

Lesson Objectives

After completing this lesson, participants will be able to:

- Identify intramuscular locations for epinephrine administration
- Demonstrate the use of an EpiPen®
- Identify the accurate size needle and syringe to be used
- Properly draw up epinephrine using a vial and an ampule
- Adequately perform an intramuscular injection of epinephrine

Lesson at a Glance

Activity	Materials	Preparation	Approximate class time
FOCUS:	• <i>Introduction to Epinephrine Administration (Focus on Empathy)</i> worksheet • <i>Introduction to Epinephrine Administration (Focus on Empathy)</i> Instructor Resource • <i>Introduction to Epinephrine Administration Pre-test</i> • <i>Introduction to Epinephrine Administration Pre-test – Answer Key</i>	1. Print/photocopy <i>Introduction to Epinephrine Administration (Focus on Empathy)</i> worksheet and <i>Introduction to Epinephrine Administration Pre-test</i> (one per participant)	15-20 minutes
LEARN	• <i>Introduction to Epinephrine Administration</i> slide presentation • Epinephrine Training Kit • Sharps container or simulated sharps container	1. Prepare <i>Introduction to Epinephrine Administration</i> slide presentation for viewing	30 minutes
REVIEW	• <i>Introduction to Epinephrine Administration</i> slide presentation • <i>Introduction to Epinephrine Administration Post-test</i> • <i>Introduction to Epinephrine Administration Post-test – Answer Key</i> • Epinephrine Training Kit • Sharps container or simulated sharps container	1. Prepare <i>Introduction to Epinephrine Administration</i> slide presentation for viewing 2. Print/photocopy <i>Introduction to Epinephrine Administration Post-test</i> (one per participant)	15-20 minutes

Instructor Note: Focus activities may also be completed prior to class.

Lesson One – Introduction to Epinephrine Administration

FOCUS: Developing Awareness of Patient-Focused Care

15-20 minutes

Purpose:

To help students develop an awareness of patient-focused care. Take the *Introduction to Epinephrine Administration Pre-test*.

Materials:

- *Introduction to Epinephrine Administration (Focus on Empathy) worksheet*
- *Introduction to Epinephrine Administration (Focus on Empathy) Instructor Resource*
- *Introduction to Epinephrine Administration Pre-test*
- *Introduction to Epinephrine Administration Pre-test – Answer Key*

Facilitation Steps:

1. Distribute the *Introduction to Epinephrine Administration (Focus on Empathy) worksheet* prior to or at the beginning of class.
2. Have the *Introduction to Epinephrine Administration (Focus on Empathy) Instructor Resource* page available.
3. Pair up students and have them complete the *Introduction to Epinephrine Administration (Focus on Empathy) worksheet*.
4. Distribute the *Introduction to Epinephrine Administration Pre-test* and have students complete it.
5. Either collect the pre-test or have students self-correct, using the *Introduction to Epinephrine Administration Pre-test – Answer Key* as a resource.

Introduction to Epinephrine Administration

(Focus on Empathy)

Skill: EpiPen® Administration

READ the following:

It's a Sunday afternoon and your Emergency Medical Services (EMS) unit is dispatched to a local park for a possible allergic reaction in a young child. Dispatch advises you en route that a 10-year-old boy has been stung by a bee and his mother is too upset to administer his EpiPen®. You arrive on the scene and are directed to the patient's location, where you see a young boy sitting on a bench, struggling to breathe. His face is swollen and you hear audible wheezing. His mother runs to you crying and says that her son is allergic to bees. She has an EpiPen®, but she cannot remember how to use it. While you and your partner are preparing to evaluate the patient and administer the EpiPen®, the mother starts screaming that you aren't doing anything and that her son is going to die. You try to reassure her while asking her to calm down so she can answer your questions. She becomes even more upset, which is making her son's situation worse. Although you need to assist your partner in providing medical care to the patient, you also need to aid the mother.

REFLECT on the situation:

What emotions do you think the mother is feeling?

What emotions do you think the EMS personnel are feeling in a situation like this, especially when a child is involved?

Do you think that calls involving infants and children are more difficult to run than those involving adults? Why?

What would you say to help calm the mother down?

SHARE your thoughts with a peer when it's discussion time.

Introduction to Epinephrine Administration

(Focus on Empathy) Instructor Resource

Skill: EpiPen® Administration

READ the following:

It's a Sunday afternoon and your Emergency Medical Services (EMS) unit is dispatched to a local park for a possible allergic reaction in a young child. Dispatch advises you en route that a 10-year-old boy has been stung by a bee and his mother is too upset to administer his EpiPen®. You arrive on the scene and are directed to the patient's location, where you see a young boy sitting on a bench, struggling to breathe. His face is swollen and you hear audible wheezing. His mother runs to you crying and says that her son is allergic to bees. She has an EpiPen®, but she cannot remember how to use it. While you and your partner are preparing to evaluate the patient and administer the EpiPen®, the mother starts screaming that you aren't doing anything and that her son is going to die. You try to reassure her while asking her to calm down so she can answer your questions. She becomes even more upset, which is making her son's situation worse. Although you need to assist your partner in providing medical care to the patient, you also need to aid the mother.

REFLECT on the situation:

What emotions do you think the mother is feeling?

Fear, anxiety, hopelessness, pain, and helplessness, since she could not remember how to use the EpiPen® in an emergency.

What emotions do you think the EMS personnel are feeling in a situation like this, especially when a child is involved?

Anxiety because of the situation involving the child and the upset mother. Hope that the EpiPen® will work the first time and improve the patient's condition dramatically.

Do you think that calls involving infants and children are more difficult to run than those involving adults? Why?

I think calls involving infants and children are more difficult to run than adults because they are so small and helpless, and it's harder to communicate with them depending on their age. They are scared and it takes a lot of patience to gain their trust with a stranger. I also believe these calls become more difficult for EMS personnel once they have children of their own.

What would you say to help calm the mother down?

I would stay calm and let her know that we are doing everything we can for her son and that once the epinephrine is on board, he should be feeling a lot better. I would ask her if she would like for us to show her how to use the EpiPen so she has the confidence to use it in the future.

SHARE your thoughts with a peer when it's discussion time.

Name: _____ Class: _____

Introduction to Epinephrine Administration Pre-test

Select the best answer to the following multiple-choice questions:

1. The adult dosage EpiPen® is intended for adults and children greater than ____ kg?
 - a. 15 kg
 - b. 25 kg
 - c. 30 kg
 - d. 50 kg
2. What needle size do you use for an intramuscular (IM) injection?
 - a. 12-14 gauge
 - b. 16-18 gauge
 - c. 20-22 gauge
 - d. 22-25 gauge
3. What size of syringe do you use for an IM injection of epinephrine?
 - a. 1 cc
 - b. 5 cc
 - c. 10 cc
 - d. 15 cc
4. What is the epinephrine drug dosage for adults and children who are over the minimum weight?
 - a. 0.1-0.3mg in a 1:1000 1 mg/ml solution
 - b. 0.3-0.5mg in a 1:1000 1 mg/ml solution
 - c. 0.5-0.7mg in a 1:1000 10 mg/ml solution
 - d. 0.3-0.5mg in a 1:1000 10 mg/ml solution
5. How do you calculate the drug dosage using epinephrine 1:1000, 1 mg/ml for infants and small children?
 - a. .01 mg/kg
 - b. .02 mg/kg
 - c. .03 mg/kg
 - d. .04 mg/kg

Introduction to Epinephrine Administration

Pre-test – Answer Key

1. The adult dosage EpiPen® is intended for adults and children greater than ____ kg?
 - a. 15 kg
 - b. 25 kg
 - c. **30 kg** *Refer to slide 6*
 - d. 50 kg
2. What needle size do you use for an intramuscular (IM) injection?
 - a. 12-14 gauge
 - b. 16-18 gauge
 - c. 20-22 gauge
 - d. **22-25 gauge** *Refer to slide 7*
3. What size of syringe do you use for an IM injection of epinephrine?
 - a. **1 cc** *Refer to slide 7*
 - b. 5 cc
 - c. 10 cc
 - d. 15 cc
4. What is the epinephrine drug dosage for adults and children over the minimum weight?
 - a. 0.1-0.3mg in a 1:1000 1 mg/ml solution
 - b. **0.3-0.5mg in a 1:1000 1 mg/ml solution** *Refer to slide 8*
 - c. 0.5-0.7mg in a 1:1000 10 mg/ml solution
 - d. 0.3-0.5mg in a 1:1000 10 mg/ml solution
5. How do you calculate the drug dosage using epinephrine 1:1000, 1 mg/ml for infants and small children?
 - a. **.01 mg/kg** *Refer to slide 8*
 - b. .02 mg/kg
 - c. .03 mg/kg
 - d. .04 mg/kg

Lesson One – Introduction to Epinephrine Administration

LEARN: Epinephrine Administration Slide Presentation

30 minutes

Purpose:

Participants will receive a thorough introduction to the intramuscular administration of epinephrine using an EpiPen[®], drawing up the proper dose of epinephrine from a vial and ampule utilizing the proper needle and syringe, and administering epinephrine intramuscularly using a needle and syringe.

Materials:

- *Introduction to Epinephrine Administration* slide presentation
- Epinephrine Training Kit
- Sharps container or simulated sharps container

Facilitation Steps:

Share the following information as you show the slide presentation.

Slide 1: Introduction slide to Epinephrine Administration

Slide 2: Prerequisite knowledge for this lesson are the signs and symptoms of anaphylaxis, basic anatomy, proper patient care, and documentation.

Slide 3: This is the abbreviated version of the many effects that epinephrine has on the body. This version is aimed specifically at anaphylaxis.

Slide 4: Explain what to do in the event of a contamination, i.e. don new gloves, open a new needle and syringe, or re-swab container and contact points.

Slide 5: Please refer to slide 11 for a diagram of the proper thigh location to administer the injection. Note that it may be necessary to give a second dose of epinephrine if symptoms do not improve. Students can practice with the EpiPen[®] Trainer on themselves.

Slide 6: When to use more than one EpiPen[®]. If you or your child do not feel better or get worse, you can inject another dose of EpiPen[®] or EpiPen Jr[®] **5 to 15 minutes** after the first injection. **Do not inject more than 2 injections right after each other.**

Slide 7: Here is a good slide to reiterate the aseptic technique. The gauge refers to the diameter of the needle. The higher the gauge, the smaller the needle. You can show the students how to find the gauge size and length of the needle on the packaging. Explain the importance of using a 1cc syringe to accurately determine the proper dosage to draw up.

Slide 8: Show the vial and ampule to your students and show them how to make sure it's the correct solution (1:1000) 1mg/ml. You can also describe how to calculate the infant and children dosage at .01 mg/kg

Slide 9: Show the students how to find the expiration date on the vial and ampule. Explain what to do if the medication is expired. If there are bubbles in the syringe, slowly push the plunger towards the vial and slowly draw the medication back into the syringe.

Slide 10: Demonstrate how to “flick” the top and bottom of the ampule to release the medication. Explain how filter needles are not always used but are preferred when drawing medicine from an ampule in order to reduce glass contamination with the patient. Demonstrate how to break the ampule using the ampule breaker in the Epinephrine Training Kit. Demonstrate how to use the filter needle, draw up the epinephrine in a syringe, replace the filter needle with an injection needle, and discard the ampule and filter needle in a sharps container or simulated sharps container.

Slide 11: Here is another opportunity to describe how to “flick” the side of the syringe to remove bubbles. Explain the importance of slowly releasing the air so as not to lose the medication.

Slide 12: This site can be used, but the most preferred site is in the thigh, which is on the next slide. This site is not recommended for multiple injections, and no more than 1ml of medication. It is usually used for vaccines. To locate this site, feel for the bone (acromion process) that is located at the top of the upper arm. The correct area to give the injection is two finger widths below the acromion process. At the bottom of the two fingers will be an upside-down triangle. Give the injection in the center of the triangle. If there is an issue using the thighs for the injection, (i.e. bilateral amputation or casts on both legs).

Slide 13: Divide the upper thigh into three equal parts. Locate the middle of these three sections. The injection should go into the outer top portion of this section.

Slide 14: You can demonstrate with the training kit how to have all your supplies ready before you start.

Slide 15: This is a good time to explain the six rights of medication administration.

- Right Patient
- Right Medication
- Right Route
- Right Dose
- Right Time
- Right Documentation

Explain how if there is visible blood when they aspirate, which is rare, they need to choose a new site. The students should know how to explain the procedure to the patient, proper documentation procedures, and reevaluation of the patient after any medication administration. If symptoms don't resolve or worsen within 5 minutes, contact medical control for a potential second dose of epinephrine.

Slide 16: This now carries over into the Review section of the curriculum. Keep the slide presentation open to refer to the proper steps that will be needed during the practice and assessment.

Using the Epinephrine Training Kit and the Large Injection Pad, have students demonstrate IM injections. Using the simulation epinephrine vials, have students demonstrate drawing up epinephrine into the syringe and using the EpiPen® Trainers with the injection pad.

Lesson One – Introduction to Epinephrine Administration

REVIEW: Practice and Assessment of Epinephrine Administration

15-20 minutes

Purpose:

Participants will practice drawing up epinephrine from a vial using a needle and syringe. They will practice administration of an Epinephrine intramuscular injection using the needle and syringe and EpiPen® Trainer on the injection pad. Once the practice and assessment are complete, participants will complete a post-test.

Materials:

- *Introduction to Epinephrine Administration* slide presentation
- *Introduction to Epinephrine Administration Post-test*
- *Introduction to Epinephrine Administration Post-test – Answer Key*
- Epinephrine Training Kit
- Sharps container or simulated sharps container

Facilitation Steps:

1. Starting with slide 4, have the students practice these steps using the EpiPen® trainers. The students can practice with the EpiPen® trainer on themselves without any risk.
 - a. Simulate removing the EpiPen® from the box.
 - b. Unscrew the yellow/ orange cap from the container and slide out the EpiPen®.
 - c. Remove the gray safety cap from the back of the EpiPen®. It won't work unless this cap is removed.
 - d. Grasp the EpiPen® in a fist and press the black rounded tip hard into the thigh. Hold the EpiPen® in place while slowly counting to 10. The pen can inject right through clothing.

- e. Simulate discarding the EpiPen® in a sharps container.
2. **Slide 6:** Have the students select and prepare the syringe using the materials provided in the training kit.
 - a. Needle size: The appropriate gauge for intramuscular injections is 22-25-gauge. The kit provides 23-gauge needles.
 - b. Syringe size: For epinephrine injections, use a 1cc syringe.
 - c. With gloved hands, remove the syringe and needle from the packaging. Attach the needle to the syringe if it is not already attached, twisting and turning in a clockwise direction.
 3. **Slide 7:** Review proper drug dosage for adults and children. Emphasize the 1:1000 solution and 1 mg/ml (it will be on the test).
 4. **Slide 8:** Prepare the syringe using a vial of epinephrine.
 - a. Confirm that you have the proper medication and confirm the date of expiration.
 - b. Remove the plastic lid.
 - c. Wipe the stopper with an antiseptic swab.
 - d. Fill the syringe with air equal to the volume of the medication wanted.
 - e. Insert the needle and inject air into the empty space above the fluid line.
 - f. Slowly withdraw the medication, making sure that the plunger does not pull out of the syringe.
 5. **Slide 10:** Preparing the syringe for injection.
 - a. Hold the syringe upright.
 - b. Allow bubbles to rise by “flicking” the side of the syringe.
 - c. Push out the remaining air.
 - d. Use caution. Do not lose medication when ejecting air.

6. **Slide 12:** Choosing the site for IM injections. The lateral mid-thigh is the preferred injection site for adults and children. Review the slide for pictures of the proper location. Have students identify the proper location using themselves or a partner.
7. **Slide 13:** Preparing the site for injection.
 - a. Have all the supplies needed for the injection:
 - Personal protective equipment
 - Proper size needle and syringe
 - Epinephrine
 - Alcohol swabs
 - 2x2's and/or Band-Aids
 - Sharps container
 - b. Select location (lateral mid-thigh is preferred).
 - c. Swab with an alcohol wipe.
 - d. Avoid touching the site after cleaning.
8. **Slide 14:** Administering the injection using the training injection pad.
 - a. Insert at 90 degrees (straight in).
 - b. Pull the plunger back a quarter of an inch (aspirate). Look for blood.
 - c. If blood is visible, stop the injection (this is rare).
 - d. If no blood is visible, continue injection.
 - e. Press the plunger all the way in.
 - f. Remove the needle. Use a safety device to cap it.
 - g. Press on the injection site with a 2x2 or apply a bandage.
 - h. Dispose of the needle and syringe in a sharps container.
9. Instruct students to take a few minutes to complete the post-test.
10. Have students self-check their answers as you share from the answer key.

Name: _____ Class: _____

Introduction to Epinephrine Administration Post-test

Select the best answer to the following multiple-choice questions:

1. The adult dosage EpiPen® is intended for adults and children greater than ____ kg?
 - a. 15 kg.
 - b. 25 kg.
 - c. 30 kg.
 - d. 50 kg.
2. What size needle do you use for an intramuscular (IM) injection?
 - a. 12-14 gauge
 - b. 16-18 gauge
 - c. 20-22 gauge
 - d. 22-25 gauge
3. What size syringe do you use for an IM injection of epinephrine?
 - a. 1 cc
 - b. 5 cc
 - c. 10 cc
 - d. 15 cc
4. What is the epinephrine drug dosage for adults and children who are over the minimum weight?
 - a. 0.1-0.3mg in a 1:1000 1 mg/ml solution
 - b. 0.3-0.5mg in a 1:1000 1 mg/ml solution
 - c. 0.5-0.7mg in a 1:1000 10 mg/ml solution
 - d. 0.3-0.5mg in a 1:1000 10 mg/ml solution
5. How do you calculate the drug dosage using epinephrine 1:1000, 1 mg/ml for infants and small children?
 - a. .01 mg/kg
 - b. .02 mg/kg
 - c. .03 mg/kg
 - d. .04 mg/kg

Introduction to Epinephrine Administration

Post-test – Answer Key

1. The adult dosage EpiPen® is intended for adults and children greater than ____ kg?
 - a. 15 kg.
 - b. 25 kg.
 - c. **30 kg.** *Refer to slide 6*
 - d. 50 kg.
2. What size needle do you use for an intramuscular (IM) injection?
 - a. 12-14 gauge
 - b. 16-18 gauge
 - c. 20-22 gauge
 - d. **22-25 gauge** *Refer to slide 7*
3. What size syringe do you use for an IM injection of epinephrine?
 - a. **1 cc** *Refer to slide 7*
 - b. 5 cc
 - c. 10 cc
 - d. 15 cc
4. What is the epinephrine drug dosage for adults and children over the minimum weight?
 - a. 0.1-0.3mg in a 1:1000 1 mg/ml solution
 - b. **0.3-0.5mg in a 1:1000 1 mg/ml solution** *Refer to slide 8*
 - c. 0.5-0.7mg in a 1:1000 10 mg/ml solution
 - d. 0.3-0.5mg in a 1:1000 10 mg/ml solution
5. How do you calculate the drug dosage using epinephrine 1:1000, 1 mg/ml for infants and small children?
 - a. **.01 mg/kg** *Refer to slide 8*
 - b. .02 mg/kg
 - c. .03 mg/kg
 - d. .04 mg/kg

Sources

1. Brouhard, Rod (2019, June 26). *How to Use an EpiPen*. Retrieved from <https://www.verywellhealth.com/rod-brouhard-emt-p-129815>
2. Connecticut State Education and Training Committee (2019). *2019 EMT IM Epinephrine Administration*. Retrieved from https://portal.ct.gov/-/media/Departments-and-Agencies/DPH/dph/ems/pdf/Training/Check-and-Inject-EMT-IM-Epi-Final-2019_02_07.ppt?la=en
3. Cafasso, Jacquelyn (2017, August 11). *What are Intramuscular Injections?* Retrieved from <https://www.healthline.com/health/intramuscular-injection#howto>
4. EpiPen Website (2018). *When to use EpiPen*. Retrieved from <https://www.epipen.ca/en/about-epipen/when-to-use>