

Cardiac Arrest Management and AED Curriculum



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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.



Cardiac Arrest Management and AED Curriculum

Curriculum Structure

The *Cardiac Arrest Management and AED* curriculum is composed of the following lessons. Approximate lesson times are included.

Lesson	Title	Approximate Time
One	FOCUS: Developing Awareness of Patient-Focused Care	30 minutes
One	LEARN: Cardiac Arrest Management and AED Curriculum Slide Presentation	60 minutes
One	REVIEW: Practice and Assessment of CPR and AED use	60 minutes
	Total	2.5 hours

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 – Cardiac Arrest Management and AED

Lesson Overview

In this lesson, students will learn how to identify and manage cardiac arrest using cardiopulmonary resuscitation (CPR) and the Automated External Defibrillator (AED) Trainer on adult, child, and infant manikins.

Pre-Lesson Knowledge

- Basic anatomy and physiology
- How to check for a carotid pulse on an adult and child
- How to check for a brachial pulse on an infant
- Use of personal protective equipment (PPE) and body substance isolation (BSI) procedures
- Proper patient care and documentation

Lesson Objectives

After completing this lesson, participants will be able to:

- Demonstrate how to identify a cardiac arrest
- Demonstrate how to perform CPR on an adult, child, and infant
- Demonstrate how to use the AED Trainer

Lesson at a Glance

Activity	Materials	Preparation	Approximate class time
FOCUS	• <i>Cardiac Arrest Management and AED (Focus on Empathy) worksheet</i> • <i>Cardiac Arrest Management and AED (Focus on Empathy) Instructor Resource</i> • <i>Cardiac Arrest Management and AED Pre-test</i> • <i>Cardiac Arrest Management and AED Pre-test – Answer Key</i>	1. Print/photocopy <i>Cardiac Arrest Management and AED (Focus on Empathy) worksheet</i> and <i>Cardiac Arrest Management and AED Pre-test</i> (one per participant)	20 minutes
LEARN	• <i>Cardiac Arrest Management and AED</i> slide presentation • AED Trainer • Adult, Child, and Infant CPR Manikins • Adult and Infant Bag Value Mask (BVM's) • O2 (if available)	1. Prepare <i>Cardiac Arrest Management and AED</i> slide presentation for viewing	60 minutes
REVIEW	• AED Trainer • Adult, Child, and Infant CPR Manikins • Adult and Infant BVM's • O2 (if available) • <i>Cardiac Arrest Management and AED Post-test</i> • <i>Cardiac Arrest Management and AED Post-test – Answer Key</i>	1. Print/photocopy <i>Cardiac Arrest Management and AED Post-test</i> (one per participant)	60 minutes

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

Lesson One – Cardiac Arrest Management and AED

FOCUS: Developing Awareness of Patient-Focused Care

30 minutes

Purpose:

To help students develop an awareness of patient-focused care.

Materials:

- *Cardiac Arrest Management and AED (Focus on Empathy)* worksheet
- *Cardiac Arrest Management and AED (Focus on Empathy)* Instructor Resource
- *Cardiac Arrest Management and AED Pre-test*
- *Cardiac Arrest Management and AED Pre-test – Answer Key*

Facilitation Steps:

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

Cardiac Arrest Management and AED

(Focus on Empathy)

Skill: Interacting and treating a patient during cardiac arrest

READ the following:

You and your partner are working on a BLS unit and are dispatched to an unconscious male at a local movie theater. There are no ALS units available at the time and you are only 2 minutes away from the movie theater. When you arrive, the theater manager meets you at the door and escorts you to the patient's location. The movie is still playing while the patient is slumped over in his seat. His wife is crying and says that he suddenly fell against her and would not respond. He is 53 years old with no known medical history, takes no medication, and is allergic to penicillin. CPR has not been initiated and there is no AED on scene. You ask the manager if he can stop the movie and turn the lights on while you and your partner move the patient to the floor. Your partner calls dispatch and asks for an ALS unit to be immediately dispatched as you check for responsiveness, a pulse, and breathing. The patient is pulseless, apneic, and unresponsive. You start compressions immediately while your partner readies the AED from your unit. The crowd starts complaining when the movie is stopped and the lights come on. The patient's wife is crying, asking if he is dead and trying to get to her husband, interfering with CPR.

REFLECT on the situation:

What emotions do you think the wife is feeling?

How should the EMT respond to her question if her husband is dead?

What could the EMT say to keep the wife from interfering with CPR?

What could the EMT say to the manager or to the patrons of the theater who are complaining?

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

Cardiac Arrest Management and AED (Focus on Empathy) Instructor Resource

Skill: Interacting and treating a patient during cardiac arrest

READ the following:

You and your partner are working on a BLS unit and are dispatched to an unconscious male at a local movie theater. There are no ALS units available at the time and you are only 2 minutes away from the movie theater. When you arrive, the theater manager meets you at the door and escorts you to the patient's location. The movie is still playing while the patient is slumped over in his seat. His wife is crying and says that he suddenly fell against her and would not respond. He is 53 years old with no known medical history, takes no medication, and is allergic to penicillin. CPR has not been initiated and there is no AED on scene. You ask the manager if he can stop the movie and turn the lights on while you and your partner move the patient to the floor. Your partner calls dispatch and asks for an ALS unit to be immediately dispatched as you check for responsiveness, a pulse, and breathing. The patient is pulseless, apneic, and unresponsive. You start compressions immediately while your partner readies the AED from your unit. The crowd starts complaining when the movie is stopped and the lights come on. The patient's wife is crying, asking if he is dead and trying to get to her husband, interfering with CPR.

REFLECT on the situation:

What emotions do you think the wife is feeling?

Uncertainty, sadness, disbelief, confusion, isolation, grief

How should the EMT respond to her question if her husband is dead?

The EMT should be honest and explain that they are doing the best they can for him, and also describe what they are doing to help resuscitate him.

What could the EMT say to keep the wife from interfering with CPR?

The EMT could explain that by her getting in their way, she is interfering with the help they are trying to provide. They could politely ask her to move back away so they have room to work on him.

What could the EMT say to the manager or to the patrons of the theater who are complaining?

The EMT could ask the manager if he could calm down the crowd, or the EMT could quickly explain that they are trying to help someone who has had a cardiac event and that they are doing their job and will be leaving shortly.

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

Name: _____ Class: _____

Cardiac Arrest Management and AED Pre-test

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

1. What is cardiac arrest?
 - a. When the lungs cannot provide enough oxygen to the brain
 - b. Cardiac arrest is a genetic defect
 - c. Failure of the heart to pump effectively
 - d. None of the above
2. Cardiopulmonary resuscitation is a combination of which two components?
 - a. Airway, breathing
 - b. Call 911, check for a pulse
 - c. Rescue breathing, chest compressions
 - d. AED, transport to a hospital
3. Where do you place the AED pads on an adult?
 - a. Middle of the chest, middle of the back
 - b. Patient's right upper chest under the collarbone, left lower chest
 - c. Patient's left upper chest over the heart, right lower chest
 - d. All the above are correct
4. In what order is CPR performed?
 - a. ABC: Airway, Breathing, Circulation
 - b. CBA: Circulation, Breathing, Airway
 - c. CAB: Compressions, Airway, Breathing
 - d. BAC: Breathing, AED, Compressions
5. After an AED delivers a shock, how long do you continue CPR before reevaluating the patient?
 - a. 1 minute
 - b. 2 minutes
 - c. 4 minutes
 - d. 5 minutes

Cardiac Arrest Management and AED

Pre-test – Answer Key

1. What is cardiac arrest? *See slide 3*
 - a. When the lungs cannot provide enough oxygen to the brain
 - b. Cardiac arrest is a genetic defect
 - c. Failure of the heart to pump effectively**
 - d. None of the above
2. Cardiopulmonary resuscitation is a combination of which two components? *See slide 4*
 - a. Airway, breathing
 - b. Call 911, check for a pulse
 - c. Rescue breathing, chest compressions**
 - d. AED, transport to a hospital
3. Where do you place the AED pads on an adult? *See slide 8*
 - a. Middle of the chest, middle of the back
 - b. Patient's right upper chest under the collarbone, left lower chest**
 - c. Patient's left upper chest over the heart, right lower chest
 - d. All the above are correct
4. In what order is CPR performed? *See slide 12*
 - a. ABC: Airway, Breathing, Circulation
 - b. CBA: Circulation, Breathing, Airway
 - c. CAB: Compressions, Airway, Breathing**
 - d. BAC: Breathing, AED, Compressions
5. After an AED delivers a shock, how long do you continue CPR before reevaluating the patient?
See slide 15
 - a. 1 minute
 - b. 2 minutes**
 - c. 4 minutes
 - d. 5 minutes

Lesson One – Cardiac Management and AED

LEARN: Cardiac Management and AED Curriculum Slide Presentation

60 minutes

Purpose:

Participants will receive a thorough introduction to the identification of cardiac arrest and how to perform CPR on an adult, child, and infant. They will also learn how to apply an AED to a patient and use the AED utilizing the AED Trainer.

Materials:

- *Cardiac Arrest Management and AED* slide presentation
- AED Trainer for student practice and demonstration of skills
- Adult, Child, and Infant CPR Manikins for student practice and demonstration of skills
- Adult and Infant BVM's for student practice and demonstration of skills
- O2 (if available)

Facilitation Steps:

Share the following information as you show the slide presentation.

Slide 2: Prerequisite knowledge for this lesson is basic anatomy and physiology, how to check for a carotid pulse in an adult and child, how to check for a brachial pulse in an infant, proper use of personal protective equipment and BSI procedures, and proper patient care, evaluation, and documentation procedures.

Slide 3: Explain how the terms *sudden cardiac death*, *cardiopulmonary arrest*, and *sudden cardiac arrest* (SCA) all have the same meaning. Depending on where your school is located and what agency/jurisdiction the EMT will work in, different terms will be more commonly used. Most people think that cardiac arrest affects only people 60 years and older. However, statistics show that 1/3 of SCA patients are under 60 years old. Cardiac arrest claims more lives than colorectal cancer, breast cancer, prostate cancer,

influenza, pneumonia, auto accidents, HIV, firearms, and house fires **combined**.

Slide 4: Bystander CPR increases survival rate by 50-75%. Even with quick response times by first responders, if CPR is not initiated within 2 minutes, the likelihood of surviving and recovering from an SCA diminishes drastically.

Slide 5: Stress the importance of this diagram and how it relates to lay rescuers (bystanders) being an important part of the chain of survival before EMS arrive.

Slide 6: The AED has become more prominent in public places and the workplace. The goal is to educate bystanders on how to use an AED and perform CPR to help improve the survival rate during a cardiac arrest. The AED will not shock asystole (flat line), which a lot of bystanders don't understand. Explain why asystole is not a viable rhythm to shock.

Slide 7: This is a quick overview of the AED Trainer and its different functions so that students can familiarize themselves with how to operate it.

Slide 8: If in doubt of a child's age or weight, the adult pads can be used. Explain the reason for drying the chest prior to applying the pads for better adhesion. Also, if a person is very hairy and the EMTs have a razor, it is advisable to quickly shave the chest where the pads will be placed.

It is extremely important to make sure everyone is clear of the patient and their clothing. Even if someone is not touching the patient, if they are near the patient's limbs, they can get shocked if the limbs move during the shock. If the patient is on a gurney, be sure no one is touching the gurney prior to shocking. Make sure to stress the importance of this.

Slide 9: Some AEDs will not have pediatric pads, especially in certain workplaces. If there are no pediatric pads available, adult pads can be used. If adult pads are used, apply one to the middle of the chest and one in the middle of the back. Some AEDs have a switch that can be set to deliver a pediatric shock. If available, turn the switch on when using on children younger than eight years old. If the AED cannot deliver a pediatric shock, an adult shock should be given.

Slide 10: If a manual defibrillator is not available, an AED can be used. Some AEDs have a switch that can be set to deliver a pediatric shock. If available, turn the switch on when using on children younger than eight years old. If the AED cannot deliver a pediatric shock, an adult shock should be given.

Slide 11: If a student has taken a CPR class before 2010, they will recognize that the order in which CPR is performed has changed. The American Heart Association reviews its guidelines every five years, and in 2010 implemented a new standard for CPR. These are the current guidelines and are up for review in 2020. The reason for the change was they found that early compressions to keep the oxygen-rich blood circulating through the body is more important than providing rescue breaths first. They also have in the guidelines that if a bystander does not feel comfortable in providing rescue breaths, that compression-only CPR still has a significant impact on a person's survivability.

Slide 12: These are the guidelines for Cardiac Arrest Management and AED use by the NREMT, adapted from their skills sheet. The NREMT follows The American Heart Association guidelines for CPR and AED.

Approach the patient from their side so they can have visual contact with you if they are conscious.

Standards have changed, so there is no checking for a pulse in the workplace or with community rescuers because studies found that they often weren't properly trained to check for a pulse. The new standards say that if someone is not breathing, they most likely do not have a pulse.

The old standards of ABCs have changed to CAB: Compressions, Airway, and Breathing. However, first responders still check for a carotid pulse.

Explain how the ribs and sternum can break during CPR (especially in elderly patients). This is not uncommon, and while the sound and feel of bones breaking is not a pleasant experience, it is necessary for the patient because without CPR, they will not survive.

Another name for a bag valve mask is an Ambu bag. Different agencies will use different terminology at times. Explain and demonstrate how to set up an Ambu bag to oxygen and how it is used in CPR.

Slide 13: Demonstrate proper hand placement for CPR and the depth needed for each patient. Explain the rate needed, and the importance of a patient lying on a firm, flat surface. If a patient is lying in bed, they need to be brought down to the floor before CPR is initiated. The song "Staying Alive" is a good tool for rescuers to use to learn how fast compressions need to be.

Slide 14: The head tilt/chin lift can be demonstrated to the students as well as how to properly apply the mask to a patient's face for ventilation.

Slide 15: If there are more than two rescuers, one can do compressions, one can do ventilations, and the other can get the AED ready. The AED pads can be applied around the rescuer performing compressions. CPR should not be stopped to apply the pads.

Slide 16: Many times, when CPR is being performed by a bystander before first responders arrive, the CPR may not be performed properly (such as inadequate compressions). It is not the place of the first responder to correct the bystander on their skills. Just take over when you are ready and thank them for their help.

Lesson One – Cardiac Arrest Management and AED

REVIEW: Practice and Assessment of CPR and AED Use

60 minutes

Purpose:

Participants will practice CPR on an adult, child, and infant. They will demonstrate how to apply the AED pads while CPR is being performed and how to use the AED Trainer to analyze the patient's rhythm and deliver a shock, if one is required. Once the practice and assessment are complete, a post-test will be given.

Materials:

- AED Trainer
- Adult, Child, and Infant CPR Manikins
- Adult and Infant BVMs
- O2 (if available)
- *Cardiac Arrest Management and AED Post-test*
- *Cardiac Arrest Management and AED Post-test – Answer Key*

Facilitation Steps:

1. **Slide 8:** Have the students become familiar with the AED Trainer and how it operates. Using the Instructor Guide that accompanies the AED Trainer, demonstrate a loose electrode connection, demonstrate a good electrode connection, simulate motion artifact, simulate a shockable rhythm, etc.
2. **Slides 9-15:** Have the students practice one-rescuer CPR on the CPR manikins while another student prepares the AED Trainer for use. An unresponsive, pulseless, and apneic scenario can be used for an adult, child, and infant using the guide that accompanies the AED Trainer. There is no trauma involved in these scenarios. There are nine pre-programmed scenarios to be used with the AED, which gives variety to the instructor and students. If there are many

students, two-rescuer CPR can also be practiced so everyone gets hands-on experience.

3. **Slide 16:** If time allows, the students can practice taking over CPR from a bystander and using the AED when it's available.
4. **Slide 17:** After the students have practiced and demonstrated CPR and AED, use on the CPR manikins, the *Cardiac Arrest Management and AED Post-test* can be given.

Name: _____ Class: _____

Cardiac Arrest Management and AED Post-test

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

1. What is cardiac arrest?
 - a. When the lungs cannot provide enough oxygen to the brain
 - b. Cardiac arrest is a genetic defect
 - c. Failure of the heart to pump effectively
 - d. None of the above
2. Cardiopulmonary resuscitation is a combination of which two components?
 - a. Airway, breathing
 - b. Call 911, check for a pulse
 - c. Rescue breathing, chest compressions
 - d. AED, transport to a hospital
3. Where do you place the AED pads on an adult?
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4. In what order is CPR performed?
 - a. ABC: Airway, Breathing, Circulation
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 - c. CAB: Compressions, Airway, Breathing
 - d. BAC: Breathing, AED, Compressions
5. After an AED delivers a shock, how long do you continue CPR before reevaluating the patient?
 - a. 1 minute
 - b. 2 minutes
 - c. 4 minutes
 - d. 5 minutes

Cardiac Arrest Management and AED

Post-test – Answer Key

1. What is cardiac arrest? *See slide 3*
 - a. When the lungs cannot provide enough oxygen to the brain
 - b. Cardiac arrest is a genetic defect
 - c. Failure of the heart to pump effectively**
 - d. None of the above
2. Cardiopulmonary resuscitation is a combination of which two components? *See slide 4*
 - a. Airway, breathing
 - b. Call 911, check for a pulse
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See slide 15
 - a. 1 minute
 - b. 2 minutes**
 - c. 4 minutes
 - d. 5 minutes

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