

# Resources to Complete AED Certification

**A**N AUTOMATED EXTERNAL DEFIBRILLATOR is a life-saving device that is becoming more common in public places as well as in medical settings. It is important for emergency responders to understand the components and procedure for using an AED. In this unit, you will learn about the hazards associated with the use of an AED. In addition, you will learn how it should be used in conjunction with CPR to increase a victim's chance of survival.



## Objective:



Explain the components and use of an automated external defibrillator.

## Key Terms:



automated external defibrillator (AED)  
cardiac arrhythmia  
defibrillation  
electrocardiogram  
fibrillation  
normal sinus rhythm  
ventricular fibrillation  
ventricular tachycardia

## Automated External Defibrillators

An **automated external defibrillator (AED)** is a computerized device used to correct a person's heart rhythm. **Fibrillation** is the rapid, irregular, and unsynchronized contraction of the heart muscle fibers. **Defibrillation** is the stopping of the fibrillation of the heart to restore normal contractions, especially by the use of an electric shock.

Emergency responders may use an automated external defibrillator (AED) if a victim is suffering from abnormal and potentially life-threatening cardiac arrhythmias. The AED advises the rescuer if an electric shock is necessary to restore a victim's heart to a normal sinus rhythm. An AED uses voice prompts, lights, and text messages to prompt the rescuer through the steps of defibrillation.

## COMPONENTS

---

All AED brands use the same steps, but the components may not be located in the same place for all brands. The basic components of an AED are an electrical box, sticky patches with a cord, and a speaker for voice commands. All models come with directions, which may be printed on the inside of the AED or in an instructional booklet. Some AEDs also include cleaning wipes.

### Buttons

There are usually several buttons on the AED. There will be a power button to turn on the unit and a button to push to deliver the shock. Units may also include a display screen for text commands.

## CARDIAC RHYTHMS

---

Cardiac rhythms can vary in people based on factors such as age, weight, genetics, and overall health.

### Normal Sinus Rhythm

**Normal sinus rhythm** is the regular cardiac rhythm measured by an AED's electrocardiogram to determine if a shock is necessary. An **electrocardiogram** is a test that measures the electrical activity of the heart. Electrodes are placed on the victim's skin to measure his or her heartbeat.

### Cardiac Arrhythmia

**Cardiac arrhythmia** is the disturbance of a normal heart rhythm. Accelerated rhythms, grouped as tachyarrhythmia, are characterized by atrial or ventricular rates that exceed normal sinus rhythm. Slowed rhythms, grouped as bradyarrhythmia, are characterized by rates registering below normal sinus rhythm.

### Ventricular Fibrillation

**Ventricular fibrillation** (V-Fib or VF) is an abnormal and potentially life-threatening cardiac rhythm that occurs when no blood is pumped from the heart and all parts of the heart-

beat are out of sync. V-Fib often occurs as a result of coronary artery disease as a heart attack. It must be treated as an extreme emergency and is fatal unless treated promptly.

## Ventricular Tachycardia

**Ventricular tachycardia** (V-Tach or VT) is another abnormal, potentially life-threatening arrhythmia that can lead to ventricular fibrillation. The victim almost always has palpitations, which means the ventricles beat in an abnormal and fast, throbbing rhythm. The application of an AED is often a treatment option.

## TRAINING AND LOCATIONS

AEDs are accurate and are easy to use. Medical professionals and others may be trained to operate AEDs. Training generally takes a few hours. AEDs are used in hospitals, medical settings, and public areas (e.g., schools, shopping malls, and restaurants). An AED has become the preferred device to properly deliver shocks of electricity to the heart, converting abnormal rhythms to normal sinus rhythms.



FIGURE 1. AEDs can be found in many public places.



## BROADENING AWARENESS...

### AMAZING ASPECTS: AED Effectiveness

According to the American Heart Association's Web site (<http://www.americanheart.org>), about 294,851 people are treated for cardiac arrest outside a hospital setting each year. The victim's chance of survival decreases with each passing minute. CPR helps keep the victim alive until emergency responders arrive, but defibrillation is the most effective way to treat the patient.

Visit the following Web site to view a training video on how to use an AED. You will notice the unit gives verbal, step-by-step instructions, making it easy for a bystander with no training to use it.

<http://www.youtube.com/watch?v=nDPLpck5Xdg&feature=related>

## AED HAZARDS

If you are using an AED, ensure your own safety as well as that of the victim. Avoid touching the victim during the analyses of the heart rhythm and during the delivery of a shock. Follow the AED prompts, which may be given by voice, text, or lights.

There are risks associated with the use of an AED if the victim is wet or sweaty because the electrical shock may travel through the water instead of through the chest. If the victim is wet or sweaty, quickly dry the victim with a towel or a cloth. If the victim is lying in water, the shock may travel through the standing water. Move the victim to a dry area if possible.

Place AED pads one inch from electrical devices and internal pacemakers. If the victim has medicine patches on his or her chest, they should be removed to ensure contact between the AED and the victim's skin. If the victim has excess chest hair and an extra set of patches is available, place the extra set on the victim's chest and quickly rip them off. Make sure there is another set of pads available for use with the AED before using this method.

## AED USE IN CONJUNCTION WITH CPR

AEDs are easy to use and are specifically designed to help deliver the best care possible to increase the victim's chance of survival. Current guidelines advise using an AED as soon as possible. In an emergency situation, begin CPR and continue until the AED indicates that you should stop CPR compressions. AEDs provide voice-command instructions, such as: "Place pad directly onto victim's chest," "stop CPR," "analyzing heart rhythm," "stay clear of the victim," and "shock advised."

Place patches on the victim's upper right chest and on the left side below the armpit. Placement illustrations are commonly shown on the patch.



**FIGURE 2.** Placement illustrations are commonly shown on the patches included with an AED.

## Summary:



An automated external defibrillator is a computerized device used to change a person's heart rhythm in emergency situations. Basic components are an electrical box, sticky patches with a cord, a speaker for voice commands, cleaning wipes, and directions. Emergency responders should follow the commands given by the AED as it analyzes the victim's heart rhythm and should deliver a shock if recommended.

## Checking Your Knowledge:

---



1. What is an AED?
2. What are the basic components of an AED?
3. What are three hazards emergency responders face when using an AED?
4. What are some voice commands given by an AED?
5. Where on the body should AED patches be placed?

## Expanding Your Knowledge:

---



Locate at least three AEDs in public places in your community. Ask school administrators, nursing home directors, and store or restaurant managers if an AED is present in their place of business. Ask if employees are trained to use the devices and if the devices are located in an area accessible by customers or clients. Ask how the units are maintained and if they have been used in the past year. Share the information with your classmates, and compile a master list of all the AEDs you discover in your community.

## Web Links:

---



### AEDs in the Workplace

<http://www.osha.gov/SLTC/aed/index.html>

### AED Programs

<http://www.americanheart.org/presenter.jhtml?identifier=3011859>

### Cardiac Arrest Warning Signs

<http://www.americanheart.org/presenter.jhtml?identifier=3053>

### Chain of Survival

<http://www.americanheart.org/presenter.jhtml?identifier=3012016>