

## Frequently Asked Questions About AEDs

### General Questions About AEDs

- What does AED stand for?
- What's an AED?
- How does an AED work?
- Why are AEDs important?
- Who can use an AED?
- What is a cardiac arrest?
- Is cardiac arrest the same thing as a heart attack?
- Does a cardiac arrest only happen after a heart attack?
- Why does someone experiencing a cardiac arrest need an AED?
- Will an AED always resuscitate someone in cardiac arrest?

### Questions About AED Placement

- What is public access to defibrillation?
- How should AEDs be placed?
- Why is notifying the local EMS office important?
- Why should a licensed physician or medical authority be involved with purchasers of AEDs?
- Why should people who are responsible for operating an AED receive CPR training?
- If AEDs are so easy to use, why do people need formal training in how to use them?
- Can anyone buy an AED?
- How much does an AED cost?
- What steps should an organization take to buy an AED for its premises?
- Which AED model does the AHA recommend?

### Questions About AED Use

- Is an AED safe to use?
- Are AEDs safe to use on children?
- Will I get zapped if I shock a victim in the rain or near water?
- Can an AED make mistakes?
- Why do you stop CPR as the electrode pads are placed and analysis occurs?
- Why should a lay rescuer continue CPR after the arrival of emergency medical services (EMS) professionals?
- Why does it seem that the victim goes without CPR for so long during defibrillation, and why does an AED shock so many times?
- Besides using an AED, how else might a lay rescuer help at the scene of a sudden cardiac arrest?
- What actions should a CPR responder take after using an AED on a person in cardiac arrest?

**What does AED stand for?**

AED stands for automated external defibrillator.

**What's an AED?**

An AED is a device used to administer an electric shock through the chest wall to the heart. Built-in computers assess the patient's heart rhythm, judge whether defibrillation is needed, and then administer the shock. Audible and/or visual prompts guide the user through the process.

**How does an AED work?**

A microprocessor inside the defibrillator interprets (analyzes) the victim's heart rhythm through adhesive electrodes (some AED models require you to press an ANALYZE button). The computer analyzes the heart rhythm and advises the operator whether a shock is needed. AEDs advise a shock only to ventricular fibrillation and fast ventricular tachycardia. The electric current is delivered through the victim's chest wall through adhesive electrode pads.

**Why are AEDs important?**

AEDs are important because they strengthen the Chain of Survival. They can restore a normal heart rhythm in victims of sudden cardiac arrest. New, portable AEDs enable more people to respond to a medical emergency that requires defibrillation. When a person suffers a sudden cardiac arrest, their chance of survival decreases by 7% to 10% for each minute that passes without defibrillation. AEDs save lives.

**Who can use an AED?**

Most AEDs are designed for use by non-medical personnel such as police, flight attendants, security guards, and other lay rescuers who have been properly trained. Having more people in the community who can respond to a medical emergency by providing defibrillation will greatly increase sudden cardiac arrest survival rates.

**What is a cardiac arrest?**

A cardiac arrest means that the heart stops pumping blood through the body. Without a constant blood supply, the brain stops working almost immediately and the person goes unconscious.

**Is cardiac arrest the same thing as a heart attack?**

No. A heart attack is caused by a sudden blockage of a small artery that supplies blood to the heart muscle. When the blood supply is cut off, that portion of the heart muscle dies and this is what causes the pain. Some people who have heart attacks may experience a cardiac arrest.

**Does a cardiac arrest only happen after a heart attack?**

No. Anyone can have a cardiac arrest at any time. Heart attacks are only one potential cause of cardiac arrest.

**Why does someone experiencing a cardiac arrest need an AED?**

In a cardiac arrest, the heart most often goes into uncoordinated electrical activity called ventricular fibrillation. The heart twitches ineffectively and can't pump blood. The AED delivers electric current to the heart muscle, momentarily stunning the heart, stopping all activity. This gives the heart an opportunity to resume beating effectively.

**Will an AED always resuscitate someone in cardiac arrest?**

The AED treats only a heart in ventricular fibrillation (VF), an irregular heart rhythm. In cardiac arrest without VF, the heart doesn't respond to electric currents but needs medications. The victim needs breathing support. AEDs are less successful when the victim has been in cardiac arrest for more than a few minutes, especially if no CPR was provided.

**Questions About AED Placement****What is public access to defibrillation?**

Public access to defibrillation (PAD) means making AEDs available in public and/or private places where large numbers of people gather or people who are at high risk for heart attacks live.

**How should AEDs be placed?**

According to the American Heart Association, it is recommended that all EMS first-response vehicles and ambulances be equipped with an AED or another defibrillation device (semiautomatic or manual defibrillator), which is the current San Diego County standard. The AHA also supports placing AEDs in targeted public areas such as sports arenas, gated communities, office complexes, doctor's offices, shopping malls, etc. When AEDs are placed in a community, the AHA strongly encourages that they be part of a defibrillation program in which:

- Persons or entities that acquire an AED notify the local EMS office.
- A licensed physician or medical authority provides medical oversight to ensure quality control.
- Persons responsible for using the AED are trained in CPR and how to use an AED.

**Why is notifying the local EMS office important?**

It's important for the local EMS system to know where AEDs are located in the community. In the event of a sudden cardiac arrest emergency, the 911 dispatcher will know if an AED is on the premises and will be able to notify the EMS system as well as the responders already on the scene.

**Why should a licensed physician or medical authority be involved with purchasers of AEDs?**

This is a quality control mechanism. The licensed physician or medical authority will ensure that all designated responders are properly trained and that the AED is properly maintained.

**Why should people who are responsible for operating an AED receive CPR training?**

Early CPR is an integral part of providing lifesaving aid to people suffering sudden cardiac arrest. The ventilation and compression skills learned in a CPR class help to circulate oxygen-rich blood to the brain. After delivering a series of three electric shocks, the typical AED will prompt the operator to continue CPR while the device continues to analyze the patient.

**If AEDs are so easy to use, why do people need formal training in how to use them?**

An AED operator must know how to recognize the signs of a sudden cardiac arrest, when to activate the EMS system, and how to do CPR. It's also important for operators to receive formal training on the AED model they will use so that they become familiar with the device and are able to successfully operate it in an emergency. Training also teaches the operator how to avoid potentially hazardous situations.

**Can anyone buy an AED?**

AEDs are manufactured and sold under guidelines approved by the Food and Drug Administration. Current FDA rules require someone who purchases an AED to present a physician's prescription for the device. The AED manufacturer usually arranges this.

**How much does an AED cost?**

The price of an AED varies by make and model. Most AEDs cost around \$2200-\$4000.

**What steps should an organization take to buy an AED for its premises?**

Any person or entity wanting to buy an AED must first get a prescription from a physician. The AED should be placed in use within a defibrillation program that includes these elements:

- Training of all users in CPR and operation of an AED.
- Physician oversight to ensure appropriate maintenance and use of the AED.
- Notification of local EMS of type and location of AED.

**Which AED model does the AHA recommend?**

AHA does not recommend a specific device. All AED models have similar features, but the slight differences allow them to meet a variety of needs. The AHA encourages potential buyers to consider all models and make a selection based on the buyer's particular needs.

- Training of all users in CPR and operation of an AED.
- Physician oversight to ensure appropriate maintenance and use of the AED.
- Notification of local EMS of type and location of AED.

### **Questions About AED Use**

#### **Is an AED safe to use?**

An AED is safe to use by anyone who's been trained to operate it. Studies have shown the devices to be 90% sensitive (able 90% of the time to detect a rhythm that should be defibrillated) and 99% specific (able 99% of the time to recommend not shocking when defibrillation is not indicated). Because of the wide variety of situations in which it will typically be used, the AED is designed with multiple safeguards and warnings before any energy is released. The AED is programmed to deliver a shock only when it has detected VF. However, potential dangers are associated with AED use. That's why training — including safety and maintenance — is important.

The American Heart Association (AHA) recommends that persons who live or work where an AED is available for use by lay rescuers participate in the AHA's Heartsaver AED Course. AEDs are so user-friendly that untrained rescuers can generally succeed in attaching the pads, pressing ANALYZE (if required), and delivering shocks. However, untrained rescuers may not know when to use an AED, and they may not use an AED safely, posing some danger of electric shock to themselves and others. Also, untrained rescuers probably would not know how to respond to the victim if the AED prompts "no shock indicated." An operator needs only to follow the illustrations on the electrode pads and the control panel and listen and follow the voice prompts (for example, "Do not touch the patient."). An AED will deliver a shock only when a shock is advised and the operator pushes the SHOCK button. This prevents a shock from being delivered accidentally.

#### **Are AEDs safe to use on children?**

An AED should not be used on a child younger than 8 years old or weighing less than about 55 pounds.

#### **Will I get zapped if I shock a victim in the rain or near water?**

It's remotely possible to get shocked or to shock bystanders if water is standing near or underneath the patient. Try to move the patient to a dry area and cut off wet clothing. Also be sure that the skin has been towed dry so the electrode

pads will stick to the skin. At the moment you press the SHOCK button, you must make sure that no one, including yourself (the AED operator), touches any part of the victim.

**Can an AED make mistakes?**

An AED will almost never decide to shock an adult victim when the victim is in non-VF. AEDs "miss" fine VF only about 5% of the time. The internal computer uses complex analysis algorithms to determine whether to shock. If the operator has attached the AED to an adult victim who's not breathing and pulseless (in cardiac arrest), the AED will make the correct "shock" decision more than 95 of 100 times and a correct "no shock indicated" decision more than 98 of 100 times. This level of accuracy is greater than the accuracy of emergency professionals.

**Why do you stop CPR as the electrode pads are placed and analysis occurs?**

For the AED to analyze accurately, the victim must be motionless. Sometimes there will be an agonal respiration (a gasping breath that can occur when the heart is stopped) that causes some movement. AEDs can recognize this extra motion and indicate, "motion detected" to the operator. This warns the operator to assess carefully for extra movements from the victim or other people at the scene.

**Why should a lay rescuer continue CPR after the arrival of emergency medical services (EMS) professionals?**

It's helpful to EMS professionals to be able to set up their equipment, including the defibrillator, while lay rescuers continue CPR. The EMTs will take over CPR and reconfirm that the victim is in cardiac arrest.

**Why does it seem that the victim goes without CPR for so long during defibrillation, and why does an AED shock so many times?**

After prescribed periods of CPR, the machine analyzes the victim's rhythm. The victim must remain motionless while the AED decides to shock and delivers the shock. Sometimes the victim doesn't change from VF to non-VF at once. These victims require multiple shocks. If repeated shocks are needed, the shocks are "stacked" in sets of three to increase their effectiveness.

**Besides using an AED, how else might a lay rescuer help at the scene of a sudden cardiac arrest?**

Lay rescuers are most often asked to call 911 and get the AED. The lay rescuer can assemble the pocket face mask and begin providing mouth-to-mask ventilations. Responders might provide CPR or continue defibrillation if a workplace defibrillator is used. Support and direction to bystanders, friends, and family are appropriate. When EMS personnel arrive, the lay rescuer can provide directions and help get information about the patient.

**What actions should a CPR responder take after using an AED on a person in cardiac arrest?**

There should be some type of debriefing for EMS personnel or lay rescuers involved in a resuscitation attempt. Also, the voice-rhythm-shock record should be collected from the AED's event documentation system. The AHA strongly recommends that AEDs used in a public access or home-responder setting have both rhythm and voice event documentation. AEDs can record and store (as a minimum) the following information:

- Patient rhythm throughout the resuscitation.
- Response of the AED (shock versus no shock; shockable rhythm versus non-shockable rhythm).
- Event and interval timing.
- Audio recording of the voices and actions recorded at the scene of a cardiac arrest.