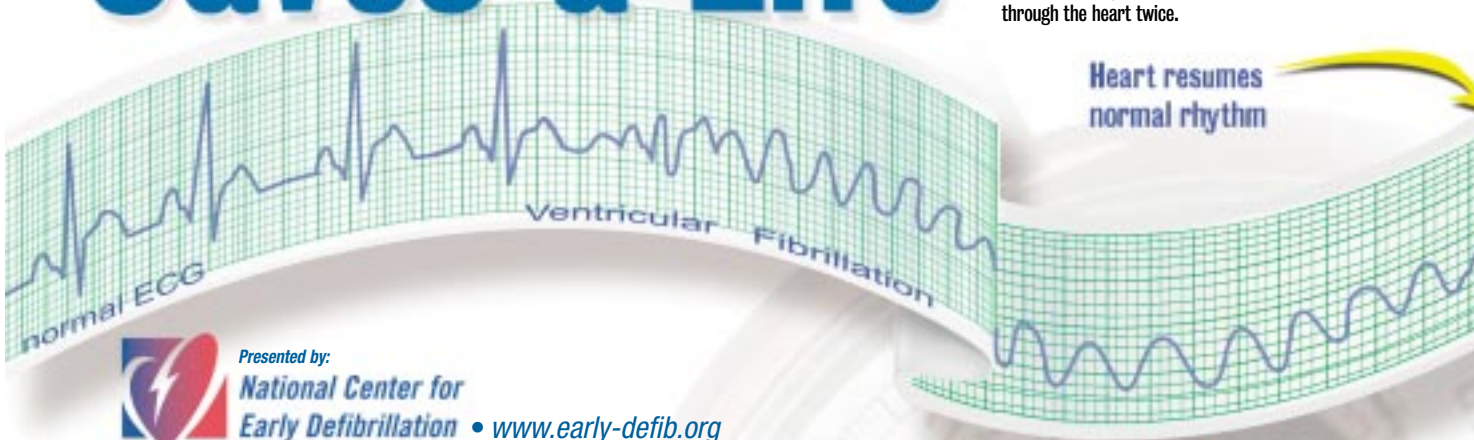


How an AED Saves a Life

Delivering a Shock to the Heart

The AED's internal computer can tell if the heart is in ventricular fibrillation, a treatable condition in which the heart quivers rapidly but does not pump effectively. If the heart is in a treatable rhythm, a shock is delivered. Current models deliver shocks of 150 to 360 joules of energy and can be monophasic, low-dose biphasic or escalating energy biphasic. In monophasic devices, which generally use higher energy levels, the electrical current passes through the heart once. In biphasic devices, which generally use lower energy levels, the current passes through the heart twice.

Heart resumes normal rhythm



Presented by:
**National Center for
Early Defibrillation** • www.early-defib.org

Every day an average of 685 people in the U.S. die from sudden cardiac arrest (SCA), according to current statistics gathered by the American Heart Association. Many of those deaths could be prevented if the heart could be shocked and returned to a normal heartbeat. The key is to quickly get a device that can deliver the shock to the patient—every minute that passes reduces the chance for survival. The AED was developed to expand the potential pool of rescuers beyond medical professionals, to include public safety providers and lay citizens, so that victims are more likely to receive timely treatment.



A Race Against Time

When someone collapses from sudden cardiac arrest (SCA), damage to the brain and vital organs occurs in as little as four minutes if untreated. SCA occurs when a person's heart unexpectedly stops pumping blood. The heart can stop for a variety of reasons but most commonly it is due to a blockage in one of the blood vessels that supplies the heart itself. Often the heart does not stop completely but goes into ventricular fibrillation, in which the heart quivers rapidly but does not pump blood effectively. A shock from an AED can reverse this condition and prevent permanent damage and death if it is delivered in the first few minutes after collapse.



The Chain of Survival

To increase the chances of resuscitation, a system of care called the Chain of Survival must be in place, so that the following actions occur as quickly as possible:

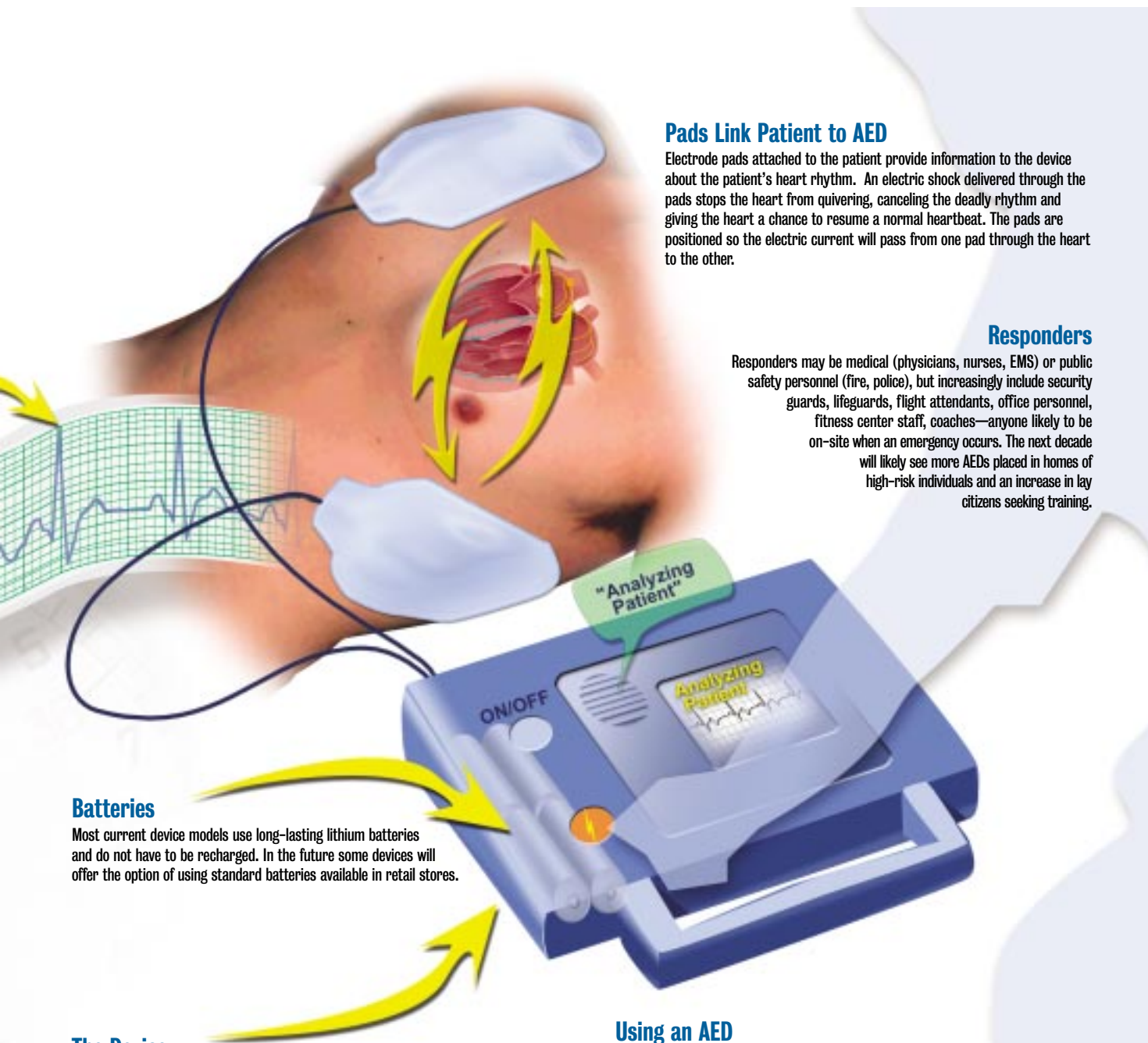
- early access (call 911)
- early CPR
- early defibrillation
- early advanced care

Early defibrillation is the key factor associated with increased survival rates. AEDs were created to strengthen this link in the chain and have been shown to be remarkably effective, with survival rates as high as 45 percent. Currently, the American Heart Association estimates 250,000 people suffer SCA each year in the United States. Only seven percent survive. If communities could achieve a 20 percent survival rate, as many as 50,000 lives could be saved each year.

Early Access

Early CPR





Pads Link Patient to AED

Electrode pads attached to the patient provide information to the device about the patient's heart rhythm. An electric shock delivered through the pads stops the heart from quivering, canceling the deadly rhythm and giving the heart a chance to resume a normal heartbeat. The pads are positioned so the electric current will pass from one pad through the heart to the other.

Responders

Responders may be medical (physicians, nurses, EMS) or public safety personnel (fire, police), but increasingly include security guards, lifeguards, flight attendants, office personnel, fitness center staff, coaches—anyone likely to be on-site when an emergency occurs. The next decade will likely see more AEDs placed in homes of high-risk individuals and an increase in lay citizens seeking training.

Batteries

Most current device models use long-lasting lithium batteries and do not have to be recharged. In the future some devices will offer the option of using standard batteries available in retail stores.

The Device

A variety of manufacturers produce devices, all of which must receive FDA clearance before being sold. They are designed to be rugged, portable, reliable and simple to use. About the size a laptop computer, a typical device weighs less than seven pounds. All models have voice prompts that provide step-by-step instructions when the device is turned on. Some devices have visual displays designed to assist in coaching the user. Currently, devices cost about \$3,500 for a single unit. Costs are expected to decrease as the use of AEDs becomes more widespread and expands into the consumer market.

Using an AED

If the victim is not showing signs of life, the responder:

- 1) Attaches the electrode pads to the victim's chest.
- 2) Presses the analyze button or allows the device to analyze automatically.
- 3) Presses the shock button if advised.

Sometimes victims do not need to be shocked but do need CPR. It's important to undergo AED training to understand when to use the AED and when and how to provide CPR.

Training

AEDs are simple, safe and effective—and easy to use with a minimum of training. Two to four hour training programs are provided by organizations such as the American Heart Association, the American Safety and Health Institute, the American Red Cross, EMP International/Medic First Aid and the National Safety Council. The programs teach students how to recognize the signs of sudden cardiac arrest, the importance of quickly calling 911 to access the emergency medical system, how to do CPR (cardiopulmonary resuscitation), and how to operate the AED and care for the patient until professional help arrives.

Illustration by Wainwright Media.

For more information about this illustration contact the National Center for Early Defibrillation at 1-866-AED-INFO or info@early-defib.org.

