

# WHEN EVERY SECOND COUNTS

*Do You Know What To Do  
In A Cardiac Emergency?*

BY NORRA MacREADY

**E**ach day, nearly 900 Americans die of sudden cardiac arrest. Their hearts skid from a steady, orderly rhythm into a riot of chaotic electrical activity that cannot effectively pump blood through the body. Doctors call this out-of-control heart rhythm “fibrillation.”

Often, sudden collapse and loss of consciousness is the first sign that someone may be in sudden cardiac arrest (SCA). With blood no longer reaching the brain, death can come within minutes. Brain cells start to die after as little as four minutes without oxygen, so bystanders must act quickly to save the victim and prevent permanent neurologic damage.

CPR—cardiopulmonary resuscitation—keeps a critical amount of blood flowing to the brain, heart and other organs until help arrives and normal heart rhythm can be restored, explains Thomas Rea, M.D., Associate Professor of Medicine at the University of Washington. Nationwide, roughly 27 percent of people who suffer SCA receive CPR from a bystander. Their chances of survival double, especially if CPR is initiated within a minute or two after the cardiac crisis begins.

The chances of survival decrease by 7 to 10 percent for every minute until CPR starts. That means if there's a five-minute delay, the patient's

survival odds decrease by 50 percent. After 10 minutes without resuscitation, he or she will probably die, warns Douglas Zipes, M.D., Distinguished Professor of Cardiology at Indiana University School of Medicine.

## Start CPR ASAP

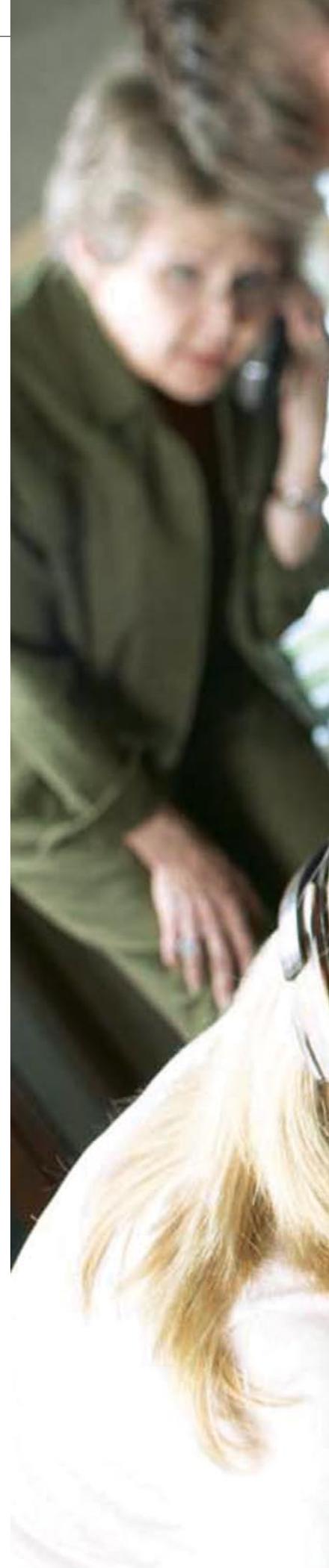
CPR has two basic components: rescue breaths and chest compressions. To assess whether someone requires CPR, a rescuer first determines whether the victim is responsive (that is, responds to voice and touch). If the victim does not respond, the rescuer opens the victim's airway. To do this, the rescuer:

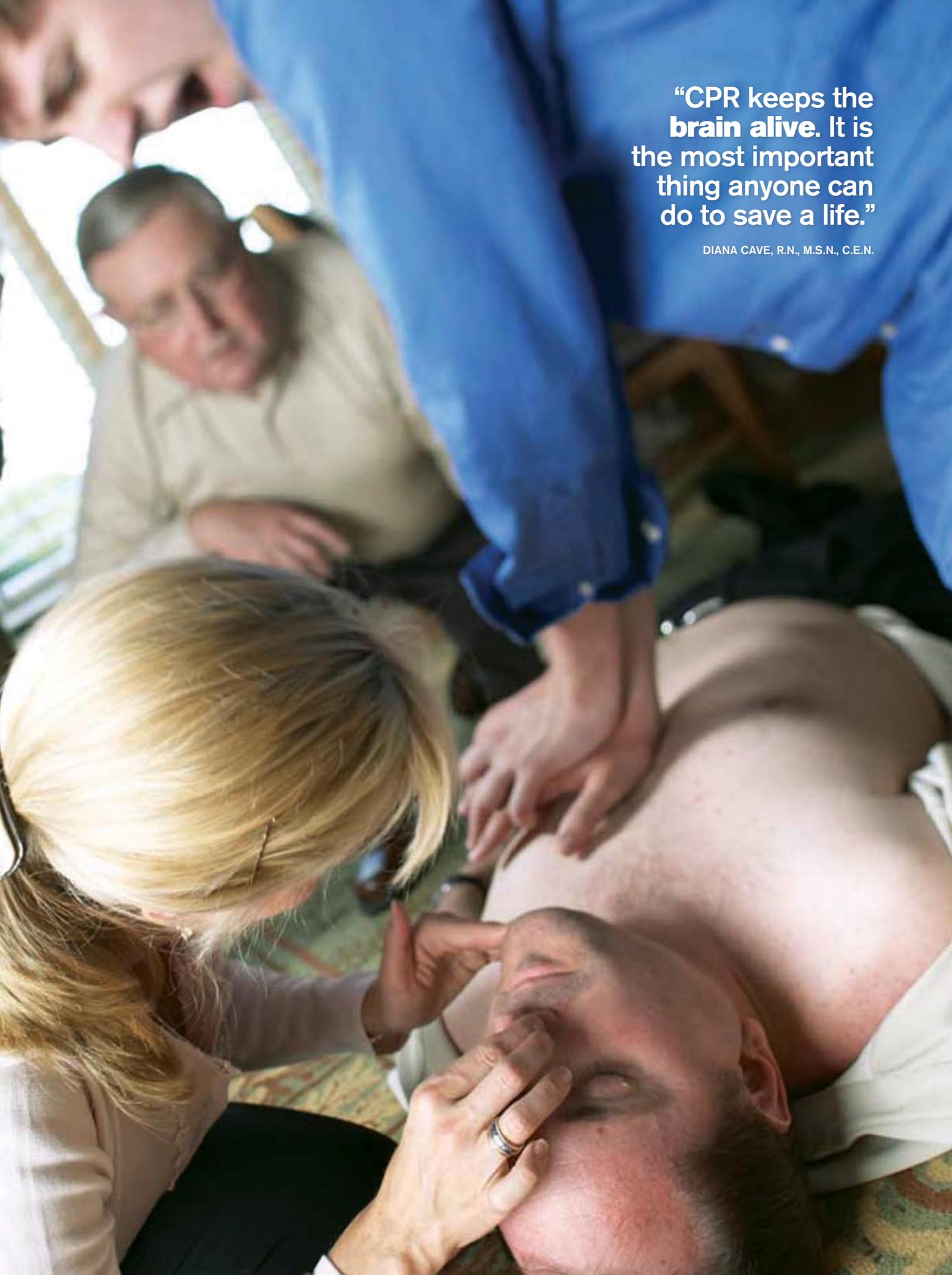
- tilts the victim's head back;
- lifts the victim's chin

The rescuer puts his or her head near the victim's nose and mouth and listens for normal breathing—defined as regular breaths that make the chest move and produce air movement. If the victim is not breathing normally, the rescuer will need to give two rescue breaths. While keeping the victim's head tilted and the chin lifted, the rescuer:

- pinches the victim's nose closed
- places his or her mouth over the victim's; and
- delivers two breaths, each about a second long (the victim's chest should rise with each breath).

Next, the rescuer moves or removes clothing





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## Roughly 27% of people who suffer Sudden Cardiac Arrest receive CPR from a **bystander**

on the victim's chest so the rescuer can see the center of the chest. The rescuer places the heel of one hand in the middle of the chest, between the nipples, then places the heel of the other hand on top of the first hand for added leverage. The rescuer starts pushing or compressing the chest down, at a rate of about 100 compressions per minute (count one-, two-, three-... pressing down as you count off each number). The rescuer should push hard—without being afraid of pushing down—deep compressions are needed to produce blood flow during CPR.

After each compression, the rescuer needs to let the chest rise up completely to allow the heart to refill with blood before the next compression. Rescuers must practice pushing hard and pushing fast, while letting the chest rise back up after each compression.

The American Heart Association (AHA) recommends that rescuers give 30 compressions, then give two more breaths, then go back and do 30 more compressions, followed by two breaths—and so on. If you are the only rescuer and you are unwilling or unable to provide mouth-to-mouth breaths then you should just do the chest compressions.

### Eliminate The Abnormal Rhythm

The AHA, American Red Cross, American College of Cardiology, and other public health organizations have advocated for the development of lay rescuer automated external defibrillator (AED) programs. Combined with CPR, AEDs are used to treat sudden cardiac arrest. Lay rescuer AED programs may save lives when they are established in places

where large numbers of people gather, such as in airports, courthouses, sports clubs, amusement parks, casinos and workplaces.

Ideally, CPR should be used as part of a comprehensive response program that includes the use of AEDs. An AED is a computerized device about the size of a laptop computer. The rescuer turns the device on and voice and visual prompts guide the rescuer through its use.

The rescuer attaches the AED to the victim's bare chest using the adhesive pads. The device detects abnormal heart rhythms. If a "shockable" rhythm is present, an electric shock will be delivered that can eliminate it and allow the heart to resume its normal rhythm. The

victim needs CPR until the AED is available, and immediately after shock delivery to support blood flow until help arrives, says Rea.

Today's AEDs are essentially foolproof, says Diana Cave, R.N., M.S.N., C.E.N., Vice Chair of the AHA's Basic Life Support Subcommittee. "AEDs give you directions immediately, including voice commands telling you what to do. After you attach the pads the AED will determine if the victim needs a shock. Then the AED tells you whether to continue giving CPR or not."

Some precaution is needed when using an AED. You should not touch a victim while the electric shock is being administered, because the current can pass from his body to yours.

Since approximately 80 percent of SCAs occur in the home, some people wonder whether they should keep an AED on hand, like a fire extinguisher. If you think that you or a family member are at risk of sudden cardiac arrest, you should talk with your doctor. Doctors may recommend buying an AED and learning CPR when someone has known cardiac disease and is thought to be at risk for sudden cardiac arrest, says Cave.

"An AED is not just something you hang on a wall and forget about until you need it," warns Anne Devine, a spokesperson for AED manufacturer PhysioControl. She recommends keeping the device someplace visible and within easy reach. The batteries should be checked once a year. Batteries typically last three to five years, and provide enough power for several shocks. Most units have lights indicating when a battery is running low. Those with AEDs in the home and lay rescuers who participate in AED programs should

practice CPR and use of the AED. The AED is most likely to contribute to saving a life if it is part of a planned and practiced response that includes recognition of the arrest, access to 911 or other emergency response number, bystander CPR and use of the AED.

Properly maintained, "These devices are as reliable as any other piece of emergency equipment," Cave tells *Heart Insight*.

Even if EMS arrives within four or five minutes, "those minutes could be the difference between life and death" if a rescuer is already administering CPR and using an AED, Cave adds. "CPR keeps the brain alive. It is the most important thing anyone can do to save a life." ■

### The Chain Of Survival

This sequence of actions the AHA calls the "chain of survival" will significantly increase the odds of a victim surviving SCA:

#### 1. EARLY ACCESS

The first sign of SCA is sudden collapse with loss of consciousness from lack of blood flow to the brain. Dial 911 immediately—the sooner the Emergency Medical Services (EMS) team arrives, the better.

#### 2. BEGIN CPR

Don't wait for the paramedics.

#### 3. USE AN AED, IF AVAILABLE

Again, don't hold off until EMS gets there.

#### 4. TRANSFER TO ADVANCED CARE

EMS personnel begin more sophisticated life support methods, such as placing a victim on a ventilator and administering intravenous epinephrine (adrenaline) to keep the heart pumping on the way to the hospital.

## Where To Learn CPR

Promptly and properly applied, CPR can maintain critical blood flow to the heart and brain and the AED can eliminate the chaotic rhythm that caused the cardiac arrest. The combination of CPR and use of an AED provide critical support until paramedics arrive. Most communities offer numerous free or inexpensive CPR training classes, and the AHA has just introduced its Family & Friends CPR Anytime kit for those who prefer to learn at home.

The AHA's goal is to train 20 million people per year in CPR by 2010. One way they're working toward that target is teaching the life-saving technique to school-age children. When students learn CPR at school and take home a Family & Friends CPR Anytime kit, many additional rescuers can be trained. For example, Basic Life Support volunteer Diana Cave instructed her son's fifth- and sixth-grade class-

mates, and asked each one of them to go home and ask at least one adult to learn using the Family & Friends CPR Anytime DVD and manikin. One child's CPR Anytime Kit was used by an additional 13 people to learn CPR.

It's easy to find a CPR class:

- On the left hand menu of links on the Home Page of the AHA Web site ([www.americanheart.org](http://www.americanheart.org)), you'll find a link for CPR & ECC (Emergency Cardiovascular Care). Click on it, and you will get to a page that can help you find a class near you by entering your zip code.
- For ordering Family & Friends CPR Anytime or Infant CPR Anytime, visit [www.shopcpranytime.org](http://www.shopcpranytime.org)
- On the left hand menu of links on the Home Page of the American Red Cross

Web site ([www.redcross.org](http://www.redcross.org)), you'll find a link for Health and Safety Services. The left hand menu of links on that page includes one that tells you how you can contact your local chapter for information on CPR and AED classes in your area.

If you want to learn CPR when and where is most convenient to you then the AHA's Family & Friends CPR Anytime kit may be your best bet. The kit includes a DVD with step-by-step instructions, a textbook, and an inflatable manikin on which to practice.

The kit to learn adult CPR costs about \$29.95, takes about 30 minutes and can be ordered online from the AHA. The AHA's new Infant CPR Anytime contains everything needed to learn the basics of infant CPR and relief of choking (newborn to 12 months) at a cost of \$34.95.



**KNOWLEDGE IS POWER** Learning how to use an AED to deliver an electric shock to the heart.