Ryckman: New link in chain

Easy-to-use machine saves lives

July 25, 2006

The call came one February morning from the healthiest person I know.

He said the pain felt like an elephant sitting on a railroad spike in the center of his chest. Call 9-1-1, I said.

Four minutes later, I pulled up to his door. The paramedics were already inside.

Fifteen minutes later, he was in the emergency room.

Fifteen minutes after that, his heart sputtered and shorted out, like a lamp with a bad connection.

For a moment, a shock from an external defibrillator brought him back to life.

And then he died again.

Like more than half the people who experience cardiac arrest, he had no history of heart problems. But here's the message I've taken away from 10 years of CPR training: don't wait. Don't ever assume you're too healthy or too young - he was only 49, and sudden cardiac arrest can happen to anyone at any age. Don't deny your pain. Don't ignore it and hope it will go away.

If your heart stops, every minute without help decreases your chances of recovering by about 10 percent. In six minutes, your brain dies. In 10 minutes, you die.

About 330,000 people die each year of heart disease in the emergency room or before reaching it, most of them from sudden cardiac arrest, according to the American Heart Association. Sudden cardiac arrest, or SCA, happens when the heart's rhythm becomes so chaotic that it no longer pumps blood to the heart and brain. The most common abnormal rhythm is ventricular fibrillation, which can happen as the result of a heart attack, electrocution or near-drowning. Student athletes can experience it from a blow to the chest.

The AHA says 90 to 95 percent of people who arrest outside a hospital die. But that could change, thanks to a powerful new link in what the AHA calls the cardiac "Chain of Survival."

It begins with early access, which means that a system like 911 is in place to alert emergency personnel to what's happening. Early cardiopulmonary resuscitation (CPR), which includes mouth-to-mouth rescue breathing and chest compressions, keeps blood flowing to the heart and brain until emergency help arrives and supplies another link, early advanced cardiac life support.

But in the past decade, another link has emerged between CPR and advanced care that can improve the odds of survival tenfold: early defibrillation. It means that people in the community are trained to use AEDs, or automated external defibrillators, and that the devices are available. Increasing the survival rates from 5 percent to just 20 percent could save 40,000 lives a year, the AHA says.

"We say it's like having a fire extinguisher in your home. It's absolutely essential to saving lives," says C.C. Dick,
spokeswoman for the state AHA chapter. "People think of the scary machine that you see on TV. But it's really so easy to use."

In June 1995, the group issued a statement supporting public access defibrillation to strengthen the chain of survival. That same summer, 12-year-old David Brooks suffered sudden cardiac arrest and died at a YMCA camp in Deckers.

"They did not have an AED, and they tried CPR. He died before they could get help," says his father, Paul Brooks. "It took over an hour even for a Flight-For-Life helicopter to get there."

Ten years later, Brooks and his wife, Laurie, succeeded in passing David's Law, which requires Colorado schools to accept donated AEDs and applies the good Samaritan law to their use, protecting anyone who uses one from liability. So far, a foundation set up in David's name has supplied AEDs to 10 schools in the Littleton school district.

The Brookses have asked the legislature to mandate and pay for AEDs in all schools, as some other states have, but they've been unsuccessful. There are, however, AEDs at the Capitol, which David toured with his fifth-grade class.

"The governor's office has AED. The governor's car has an AED. But when the kids got back on the bus, they didn't have AED on the bus, and they didn't have AED at school," Brooks says.

Heart attacks and sudden cardiac arrest aren't the same thing; the former is more of a plumbing problem, the latter an electrical one. An AED won't help a heart attack, which is brought on by an arterial blockage that prevents blood and oxygen from reaching the heart.

"People think they're going to make someone worse by shocking them, but the AED won't administer the shock unless the body needs it," Dick says. "The AED is smart enough to know when it's necessary."

An AED is the only way to jolt the heart back to its normal pattern, and the shorter the time from collapse to defibrillation, the greater the odds of survival.

In New York City, where emergency response time averages 12 minutes because of traffic and logistics, only 5 percent of all cardiac arrest victims survive, according to the National Center for Early Debrillation. Seattle has a response time of seven minutes and a 30 percent survival rate. Rochester, Minn., shaved a minute off that time and has a survival rate of 45 percent.

Research in the United States and Canada offering community CPR training in some places and CPR plus AED in others found that the AED sites had twice as many survivors. In rural areas and very crowded urban ones, AEDs could save lives that would definitely be lost before help arrived.

In one study in the New England Journal of Medicine, casino security guards were trained to use AEDs that were easy to access. The survival rate for victims who received the first shock within three minutes: 74 percent. Another study looked at AED use by American Airlines flight attendants during a two-year period. Of 14 victims in documented ventricular fibrillation, 40 percent recovered.

In winter 1997, Telluride Ski & Golf Co. made AEDs available to its ski patrol. Three weeks later, a 39-year-old woman suffered SCA and fell off the chairlift. Her life was saved by Telluride ski patrollers who administered CPR and used their new AED for the first time.

AEDs have been around for 50 years, but only in the past decade have become easy to operate and inexpensive enough - about $2,000 a unit - to put in public places. The machine uses voice prompts to talk rescuers through each step, which involves attaching pads to the victim's chest to allow the AED to analyze the heart's rhythm. If a shock is indicated, the machine tells you to push a button. If a shock would not help, the machine instructs the rescuer in CPR.

Although they are user-friendly, AED training is often taught as a supplement to CPR training, because it's important to know how to use them together, and to recognize when they're necessary. The AHA trained 100,000 Coloradans last year.

The AHA's new guidelines encourage putting AED programs in public locations like airports, casinos, sports facilities and businesses. The next step will be making it possible to have an AED at home, where nearly 80 percent of all sudden cardiac arrests happen.

People either don't have a chance to get help or wait too long, afraid that they'll feel embarrassed when it turns out to be...
nothing. Think of it this way: better to be alive and feeling a little sheepish at the hospital than dead in your living room.

In the ER, the second shock restored the normal rhythm of my friend's heart. A few hours later, he underwent triple-bypass surgery.

Today, he's the healthiest person I know.


**Four links**

Here's a rundown of the Cardiac Chain of Survival from the American Heart Association:

1. Early access: Call 911 (or the EMS system in your area) and get an automated external defibrillator (AED). First, you or other witnesses must recognize the warning signs of a heart attack, cardiac arrest, stroke or choking. Although many conditions - not just cardiac arrest - can cause unresponsiveness, all unresponsive victims will benefit from activating the Chain of Survival. As soon as an emergency is recognized, call 911. As the dispatcher asks you questions, he or she will enter the data on a computer, which will be relayed to a response team. Answer in short, specific replies, giving only the requested information.

If you are alone, you must immediately begin performing cardiopulmonary resuscitation (CPR), the next link in the chain.

2. Early CPR: "Pump and Blow." Begin cardiopulmonary resuscitation (CPR). The earlier you give CPR to a person in cardiac or respiratory arrest, the greater their chance of survival. CPR keeps oxygenated blood flowing to the brain and heart until defibrillation or other advanced care can restore normal heart action.

3. Early defibrillation: Use the automated external defibrillator (AED) to treat ventricular fibrillation, an abnormal, chaotic heart rhythm that prevents the heart from pumping blood. The sooner you provide defibrillation, the better the victim's chances of survival.

4. Early advanced care: Paramedics give basic life support and defibrillation as well as more advanced care that can help the heart respond to defibrillation and maintain a normal rhythm.

   • For more information: go to www.heart.org.

**Heart attack warning signs**

Cardiac arrest can be the result of a heart attack, which might be sudden and intense or start gradually with mild pain or discomfort. Often people aren't sure what's wrong and wait too long before getting help. Here are the danger signs:

• Chest discomfort. Most heart attacks involve discomfort in the center of the chest that lasts more than a few minutes, or that goes away and comes back. It can feel like uncomfortable pressure, squeezing, fullness or pain.

• Discomfort in other areas of the upper body. Symptoms can include pain or discomfort in one or both arms, the back, neck, jaw or stomach.
• Shortness of breath. May occur with or without chest discomfort.

• Other signs. These may include breaking out in a cold sweat, nausea or lightheadedness.

• As with men, women's most common heart attack symptom is chest pain or discomfort. But women are somewhat more likely than men to experience some of the other common symptoms, particularly shortness of breath, nausea/vomiting, and back or jaw pain.

• If you or someone you're with has chest discomfort, especially with other signs, don't wait longer than five minutes before calling 911.

• Go by ambulance, not car. Calling 911 is almost always the fastest way to get lifesaving treatment. Emergency medical services staff can begin treatment when they arrive. The staff are also trained to revive someone whose heart has stopped. Patients with chest pain who arrive by ambulance usually receive faster treatment at the hospital, too.

• If you can't gain access to the emergency medical services, have someone drive you to the hospital right away. If you're the one having symptoms, don't drive yourself unless you have absolutely no other option.

• Cardiac arrest strikes immediately and without warning. The signs are sudden loss of responsiveness and no normal breathing.

• If these signs of cardiac arrest are present, tell someone to call 911 and get an AED and begin CPR immediately.

• If you are alone with an adult who has these signs of cardiac arrest, call 911 and get an AED before you begin CPR. Use an AED as soon as it arrives. Source: American Heart Association, www.Heart.Org

**Defibrillation Q&A**

Common questions and answers about defibrillator programs from the American Heart Association and Heart Safe USA:

• What is sudden cardiac arrest?

In sudden cardiac arrest, the heart suddenly stops beating normally. The electrical impulses that control the rhythm of the heart become so disorganized that the heart can no longer effectively pump oxygenated blood to the brain and the body's vital organs, and death occurs within minutes. CPR cannot reverse ventricular fibrillation, the chaotic cardiac rhythm most often seen in SCA victims; prompt external defibrillation is the only known effective treatment to halt sudden cardiac arrest.

• What causes sudden cardiac arrest?

The most common cause of SCA is ventricular fibrillation - a lethal arrhythmia characterized by rapid, chaotic contractions of the heart. Some factors contributing to SCA include:

• Coronary heart disease
• Electrocution
• Drowning
• Choking
• Trauma
• Illegal drug use

Death from SCA is sudden and unexpected, occurring instantly or shortly after the onset of symptoms.

• What is an automated external defibrillator?

An automated external defibrillator (AED) is a computerized medical device that can check a person's heart rhythm, then advise the rescuer when a shock is needed. The AED uses voice prompts, lights and text messages to tell the rescuer the steps to take.

• How does an AED work?

A microprocessor inside the defibrillator analyzes the victim's heart rhythm through adhesive electrodes and advises whether a shock is needed. The electric current is delivered through the victim's chest wall through adhesive electrode pads. The defibrillator will not charge unless it detects a "shockable" rhythm.

• Why is early defibrillation important?

In many cases, SCA can be reversed with early defibrillation - the use of a defibrillator to shock the heart back into normal rhythm by means of an electric current.

• 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. CPR helps to circulate oxygen-rich blood to the brain. After the AED is attached and delivers a shock, the typical AED will prompt the operator to continue CPR while the device continues to analyze the victim.

• Can anyone buy an AED?

The FDA may require someone who purchases an AED to present a physician's prescription for the device (this is the case in Colorado).

• How much does an AED cost?

The price of an AED varies by make and model, but most cost about $2,000. The 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.

• Can AEDs be used on children?
Children over 8 years can be treated with a standard AED.

• How can I enroll in a CPR or AED class?

The American Heart Association offers CPR and AED training through its network of training centers. To locate a center near you, call 1-877-AHA-4CPR or the Denver office at 303-369-5433 or use the online class finder at www.heart.org.

You also can contact the American Red Cross Mile High Chapter in Denver at 303-722-7474 or www.denver-redcross.org. E-mail questions to questions@denver-redcross.org.

For more information, go to www.heartsafeusa.org; www.parentheartwatch.org; www.aed.com.

Ryckmanl@RockyMountainNews.com

MORE RYCKMAN COLUMNS »

Copyright 2006, Rocky Mountain News. All Rights Reserved.