

Every second counts ...

Public-access defibrillators save lives

by Suzanne A. Brown

Survivor beats the clock: Referee Ted Barclay, a sudden cardiac arrest survivor, is shown with his rescuer, Margaret Reynolds. She used an automated external defibrillator to save his life.

“I’m alive today due to the use of an AED (automated external defibrillator) three years ago and God’s mercy,” says Marsha Underwood emphatically. The 45-year-old is a counselor for Columbus Public Schools. Her co-workers sprang to action when she collapsed at work. They immediately called 9-1-1, and she received timely emergency treatment at the scene.

Ted Barclay, 76, a retired Denison University director of athletics recalls a similar circumstance.

“I died on April 5 (2006), and they brought me back to life,” he says, referring to bystanders who performed cardiopulmonary resuscitation (CPR) and defibrillation to save his life. “They are my angels. I thank them from the bottom of my heart,” says Barclay, now an Ohio High School Athletic Association referee.

Jim Oehlenschlager, 57, also recalls his date with fate while at work as a supervisor at KTH Parts Industries Inc. of St. Paris. “I’m told our associates used a first-aid crash cart equipped with an AED and jumped into action within seconds when I collapsed during a managers’ meeting. That was six years ago. My heart returned to a normal rhythm after the first shock. They (using CPR) and the AED saved my life.” Oehlenschlager is now an assistant vice president at Kalida (Ohio) Manufacturing Inc., a subsidiary of KTH.

Sudden cardiac arrest is not a heart attack

These three Ohioans from different walks of life traveled down the same unexpected path while at work. Each suffered sudden cardiac arrest, an abrupt loss of heart function, and stopped breathing normally.

“Cardiac arrest is different from a heart attack,” notes Dr. Stephen Schaal, a cardiologist/heart rhythm specialist at The Ohio State University (OSU) Medical Center. “Cardiac arrest is an electrical conduction problem in the heart, while a heart attack is a plumbing problem caused by heart arteries supplying blood to the heart being blocked. Some heart attacks can cause cardiac arrest, but they aren’t necessarily related.”

In other words, heart attacks occur when there is a blockage in one or more of the coronary arteries. According to the Cleveland Clinic’s Web site, this prevents the heart from receiving enough oxygen-rich blood, thus, damaging the heart muscle.

In contrast, sudden cardiac arrest occurs when the electrical system of the heart malfunctions and the heart’s rhythm becomes very irregular. AEDs help restore a victim’s normal heart rhythm. According to Schaal, the most common cause of sudden cardiac arrest is ventricular fibrillation (VF). This occurs when the heart’s lower pumping chambers (ventricles) fibrillate or flutter randomly. During VF, the victim’s heart merely quivers and does not effectively pump blood throughout the body.

Workers shocked back to life

That’s probably what happened to Underwood, Barclay and Oehlenschlager. The difference for these three workers is unlike 93 percent of other sudden cardiac arrest victims nationwide, they are still here to talk about it — thanks to AEDs.

Without any warning signs, symptoms or reasons to be concerned about their health, these workers’ hearts suddenly stopped functioning properly. Within seconds, they lost consciousness and had no pulse or blood pressure.

They had all seemed perfectly healthy, but they weren’t. Barclay, who exercises two hours daily, passed a cardiac stress test only five months earlier. And Underwood and Oehlenschlager say they both got regular physical exams, and had normal cholesterol and blood pressure readings.

Yet still, each worker experienced sudden cardiac arrest. The condition is usually fatal if the victim does not get CPR and defibrillation with an AED within three to five minutes after collapsing. “The only treatment for ventricular fibrillation is to shock the heart with a defibrillator or an AED,”

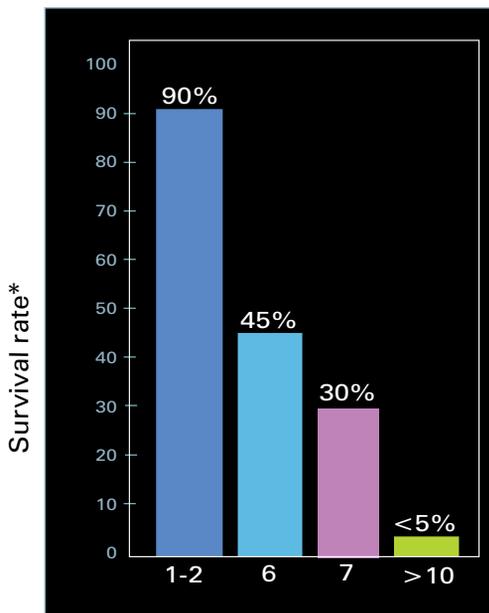
says Schaal. “You have to defibrillate them or they usually will die. CPR won’t do it alone.”

According to the American Heart Association (AHA), the heart loses about 7 percent to 10 percent of its normal function every minute it goes without help from a defibrillator. Therefore, it is essential to start giving CPR and using AEDs as soon as possible.

Without immediate defibrillation at the scene, most sudden cardiac arrest victims die before an emergency medical squad (EMS) can arrive. The Occupational Safety & Health Administration’s (OSHA’s) Web site says the average national response time from the call to 9-1-1 to the EMS squad arriving is 10 to 12 minutes. In rural and remote areas, it can take much longer.

In the case of the three workplace survivors featured here, rescuers demonstrated great foresight. They jumped to action by calling 9-1-1 immediately, administering CPR and/or using defibrillators. The electronic shock delivered by the AEDs stunned their heart muscles, returning their hearts’ rhythm to normal beats. But it was a close call for them all.

Every minute matters

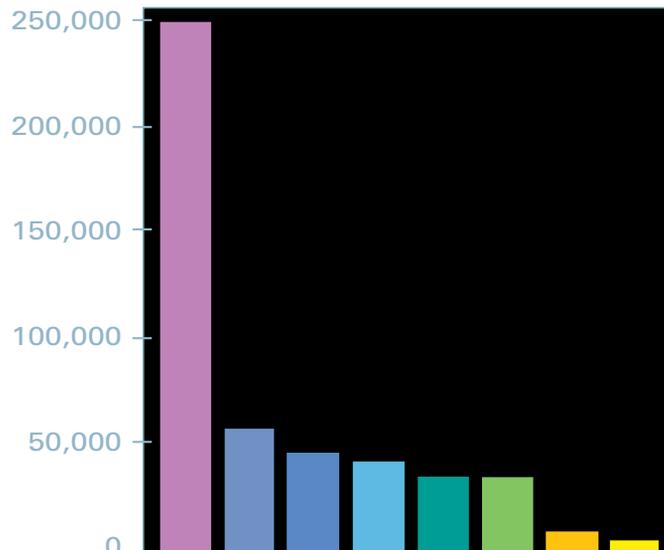


Minutes to defibrillation

* For victims of sudden cardiac arrest in witnessed ventricular fibrillation

Source: Mary Newman and James Christenson, MD, *Challenging Sudden Cardiac Death: A Community Guide to Help Save Lives* (1998)

Death rate comparison



- Sudden cardiac arrest
- Colorectal cancer
- Auto accidents
- Breast cancer
- Prostate cancer
- Gun shots
- AIDS
- House fires

Source: Sudden Cardiac Arrest Foundation



A life saved: Jim Oehlenschlager's (left) co-workers, including Jeff Snipes, saved his life by doing cardiopulmonary resuscitation and using an automated external defibrillator.

Steps to implement an AED program

- Obtain stakeholders' buy-in for implementing an automated external defibrillator (AED) program.
- Review liability; Ohio's Good Samaritan laws remove liability for responders acting in good faith.
- Determine a budget and your company's needs.
- Review manufacturers and make AED selection.
- Develop an AED response plan.
- Train first-responders and interested employees on cardiopulmonary resuscitation/AED use.
- Maintain and inspect your AEDs regularly according to manufacturers' specifications.
- Conduct mock drills.
- Offer regular CPR/AED refresher training; every six months if possible.

Sudden cardiac arrest strikes anyone, anywhere, any time

Sudden cardiac arrest is one of the leading causes of natural death among adults in the United States. Dr. Michael Sayre is an associate professor of emergency medicine at OSU and chairman of the AHA's Basic Life Support Subcommittee. He estimates sudden cardiac arrest kills 150,000 to 250,000 persons annually in non-hospital settings in the United States — including children and youth. (Statistics vary according to sources.)

According to the Sudden Cardiac Arrest Foundation, sudden cardiac arrest kills more people each year than colorectal cancer, breast cancer, prostate cancer, AIDS, car accidents, house fires and gun shots' combined. Ten percent of victims are under age 40.

The nonprofit foundation calls sudden cardiac arrest a public health crisis. However, the foundation's materials also state the condition is often treatable and curable with immediate defibrillation.

Sayre says research involving use of AEDs at O'Hare International Airport in Chicago and in Las Vegas casinos support this. Two-thirds of victims who received defibrillation within three minutes of collapsing survived. That's what saved Oehlenschlager.

Employers take action

"The plant's intercom system alerted everyone to the code blue (emergency) and its location," says Jeff Snipes, corporate auditor for KTH's Management Systems Group and



Cardiopulmonary resuscitation/automated external defibrillator training: Using a manikin, BWC employees learn CPR and how to operate an AED during a work-site class.

Top: Employee applies AED pads to manikin's chest.

Middle: Manikin with AED, which reads heart rhythms.

Bottom: Employee practices the technique of listening for breathing while another staffer stands ready with the AED.

a former safety staff member. "Our EMTs (emergency medical technicians) immediately started CPR on him. I put the AED's pads on Jim (Oehlenschlager) within one and one-half minutes after he collapsed because I was just 30 to 40 feet away in the safety office with our first-aid response unit (crash cart)."

Underwood and Barclay also received defibrillation almost immediately after they collapsed. And along with Oehlenschlager, they report having little or no heart damage as a result of getting immediate medical attention.

Good Samaritan laws enacted in all states release AED lay responders acting without “willful or wanton misconduct” from liability in helping victims. “We know employers who don’t have AEDs have more liability issues than employers who have AEDs,” Sayre states.

“Since approximately 70 percent of cardiac arrests occur at home, AEDs are now available for home use without a physician’s prescription. But, the FDA (Federal Drug Administration) requires a physician’s prescription and oversight for employer and public AED use,” Sayre adds.

OSHA reports the presence of AEDs in the workplace reduces the critical time for treatment of sudden cardiac arrest victims. Having the devices appropriately located in a business or workplace improves workers’ and customers’ chances of surviving.

Employers like KTH embrace this fact. The company has three AEDs, which its employees have used to save lives on two separate occasions. KTH understands having the device close by could make the critical difference between life and death for their employees.

“Buying an AED is an investment in your employees’ and customers’ lives,” explains Rick Esch, senior vice president and plant manager of the 250-employee, KTH car-parts subsidiary in Kalida. “You can’t put a price-tag on saving a life. But, it’s an investment you pray you don’t have

to use.” The company recently bought another AED to reduce the plant’s emergency response time to two minutes.

How AEDs work

It’s as easy as A-E-D. The American Red Cross uses this line to explain how simple it is for anyone to use an AED.

According to marketers of the device, an AED is about the size and price of a laptop computer. It weighs about four to seven pounds (without accessories), and the price for an AED in the workplace ranges from approximately \$1,200 to \$3,000, depending on the features.

The AED provides brief, but powerful electrical stimulation through the chest wall to the heart using two adhesive pads. “The electric shock from an AED varies from 120 to 360 joules,” explains John Sands, EMS coordinator, Ohio Department of Public Safety. “The shock won’t hurt the victim if they need it, and the machine won’t shock them unless they do. Not taking action is the worse thing anyone can do.”

Sands also teaches CPR classes and confirms for his students how easy it is to use an AED. He explains the device has a built-in computer that assesses the victim’s heart rhythm to determine if he or she requires a shock. The AED then uses voice, lights and/or text message prompts to tell the rescuer what to do.

Heart smart

The American Heart Association recommends everyone be prepared for cardiac emergencies by:

- Knowing the warning signs of cardiac arrest. During cardiac arrest a victim loses consciousness, stops normal breathing and loses his/her pulse and blood pressure;
- Calling 9-1-1 immediately to access the emergency medical system if you see any cardiac arrest warning signs;
- Giving cardiopulmonary resuscitation to help keep the victim alive and immediately defibrillate when the automated external defibrillator indicates it is necessary.

Automated external defibrillators (AEDs) in the workplace

Why should employers make AEDs available to employees?

According to the Occupational Safety and Health Administration, most cardiac arrest deaths do not happen in hospitals. Jobs with shift work, high stress, and exposure to certain chemicals and electrical hazards increase the risks of heart disease and sudden cardiac arrest.

How many AEDs should you have at work?

Ideally, the Sudden Cardiac Arrest Foundation states you should have enough AEDs to ensure the response interval (time from collapse to arrival of the responder with the AED) is no more than three minutes, and the call-to-shock interval is no more than five minutes.

Where in the workplace should employers place AEDs?

According to the foundation, you should place AEDs in easily accessible, well-marked locations, ideally near telephones. You can also mount AEDs on the walls of your lobby, by exits and near elevators and fire extinguishers. Place an AED sign above the device to indicate its location. In settings with mobile first-aid units (i.e., golf carts), place the AED on the cart.

Is it enough just having AEDs in the workplace?

No. Simply placing devices in various locations is not enough. It is important to identify a medical director, develop an on-site AED response plan, train designated responders, safety team members and interested employees, and then conduct periodic AED response drills. Training employees will also help lower sudden cardiac deaths at home, which is where the majority of sudden cardiac arrests occur.



AEDs save lives: Two examples of AEDs show their laptop-like portability.

BWC offers AED/CPR training class

BWC's Division of Safety & Hygiene offers a training class that teaches you how to give cardiopulmonary resuscitation (CPR) and use an automated external defibrillator (AED). The bureau offers *First Aid in the Workplace* throughout the year. There are six classes available this fall at local BWC customer service offices throughout the state.

- **Sept. 6**
Governor's Hill
- **Sept. 12**
Lima
- **Sept. 19**
Youngstown
- **Oct. 3**
Garfield Heights
- **Oct. 19**
Mansfield
- **Nov. 12**
Canton

To register, visit www.bwclearningcenter.com and enter the keywords "first aid." You may also call 1-800-OHIOBWC, and press option 2 and then 2 again.



Survivor trumps death: Ted Barclay, a sudden cardiac arrest survivor, thanks Margaret Reynolds, an everyday hero who saved his life with an automated external defibrillator.

According to the AHA, every AED takes the rescuer through the same basic steps even though there are numerous types of machines available.

Know AED location, conduct drills

"They are basically foolproof, and they show and tell you exactly what to do," notes Frank Giampetro, EMS coordinator for Premier Health Care Services of Dayton. "Everyone should know where a building's AEDs are located. An AED won't help anyone if you keep it in its case. Look at them as you do fire extinguishers. They shouldn't be kept locked up."

The bystanders who saved Barclay agree AEDs should always be easily accessible. When Barclay collapsed on the Hilliard Davidson High School lacrosse field, Margaret Reynolds, a player's parent, yelled for an AED. (Reynolds was familiar with AEDs because of a program offered through her job with the Columbus City Council.) The school's athletic trainer asked a player to retrieve the AED, and the player sprinted into the school to get it.

A fellow referee and another parent, who is a cardiac nurse, rushed to perform CPR on Barclay. Meanwhile, another bystander called 9-1-1.

When the AED arrived, Reynolds attached the device to Barclay's chest and delivered a life-saving shock. Shortly after, the ambulance arrived and paramedics gave him a second shock. Then they took him to Riverside Methodist Hospital, Columbus.

Everyday heroes

The people who came together to save Barclay are everyday heroes according to the Columbus City Council who recognized them for their efforts.

"Ralph Waldo Emerson once wrote: 'Heroes are no braver than ordinary people; they are just braver five minutes longer,'" explains Patsy Thomas, the city council member who sponsors a CPR and AED community education and acquisition program in Columbus called Project Second Chance. "And when it comes to sudden cardiac arrest, those five minutes are the difference between life and death."

Barclay got a second chance because the school had the foresight to get this life-saving device through the Ohio Schools AED Program. He also survived because the student who ran to get the device knew exactly where to find it, and other people on the scene responded immediately.

"Second Chance's goal is simple: get more Columbus citizens trained in CPR and in using an AED – and place more AEDs throughout our community: in city buildings, businesses, health clubs, community centers ... as many places as possible," says Thomas.

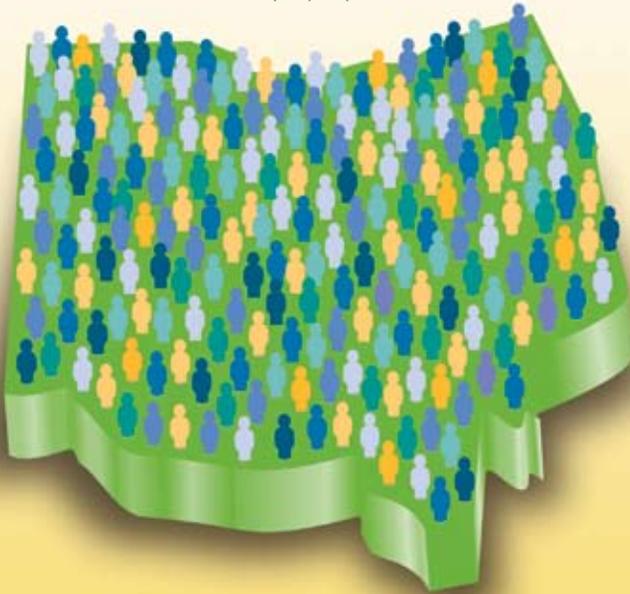
The AHA, American Red Cross, Sudden Cardiac Arrest Foundation, the National Safety Council and others share this goal. Employers who embrace this goal stand prepared to give their workers another chance at life at critical moments when every second counts. ❖

Note: The staff of Workers' Comp Quarterly dedicates this story to our late co-worker Rick Burson. A contributing writer to BWC's magazine for 16 years, Rick died in his hometown on April 25, 2006. He was 47 years old.

For more information about implementing an automated external defibrillator program in your workplace, call BWC's Mike Ely, safety technical advisor, Division of Safety & Hygiene at (614) 466-7053. You may also contact John Sands, EMS coordinator for the Ohio Department of Public Safety's Division of Emergency Medicine at (614) 387-0649.

Rate making 101

A crash course on how BWC sets employer premium rates



Do you want to understand how BWC sets your premium rate? Follow this simple road map for a step-by-step journey through BWC's employer premium rate-making process.

by **Bill Monaghan**

Note: BWC intends for this road map to convey a basic understanding of the rate-making process. It uses information in effect at this time and does not include all the details involved in rate making. The process is more complex. Visit ohiobwc.com and click on Employer, Rating Info, then Rating plan information for details on items impacting calculation of your specific rates.

There are about 5.8 million workers in Ohio. At any given time, around 5.5 million of them have jobs.

In 2005, 197,083 Ohio workers filed workers' compensation claims with BWC for occupational illnesses, injuries or deaths. Ohio's workers' compensation system allowed 178,015 of those claims.

Preventing injuries and controlling costs are BWC's main goals. However, when accidents occur, BWC's primary focus is to help sick and injured workers stay on the job or get back to gainful employment.

Determine manual classifications

The rate-setting process starts with an effort to spread out the costs of workplace injuries across all employers as equitably and fairly as possible. Some jobs are inherently more risky than others, and some injuries are more costly than others. Ohio uses a national system that divides the employer base according to the inherent risks associated with doing various jobs. The National Council on Compensation Insurance provides the system Ohio and at least 39 other states use to categorize the work force into 528 manual classifications.

Establish the projected costs

The next step in setting rates is to predict the future incurred costs of workplace injuries in each of those categories for the coming year. This step is complicated, but basically BWC actuaries* look at the incurred claims costs from four of the past five previous years to project the losses for the policy year. They exclude the most recent year. They conduct this review of claims costs to estimate the cost of workers' compensation claims for each job classification for the coming year. Next, the actuaries spread out the liability to cover those costs across every job in Ohio that falls into that classification, a process also validated by external actuarials.

Calculate base rate

After determining the projected costs of workers' compensation claims for a given classification for the year, BWC estimates the total payroll in the state for that classification for the year. The base rate BWC will charge employers is the amount necessary to cover the costs of claims for the policy year.

Who pays?

With few exceptions, employers having at least one employee in Ohio are required to pay into the state's workers' compensation insurance system.

*Actuaries are statisticians who compute insurance risks and premiums. BWC has an actuarial staff of 15 people.