Refuting the Myths About Resuscitation

The latest knowledge in resuscitation science guides AED/CPR programs and training.

By Greg Slusser  Jan 01, 2012

Just as in any medical field, researchers in resuscitation science continually search for new knowledge that can lead to better patient care. In the workplace, the latest discoveries in resuscitation science can be applied to CPR training and to automated external defibrillators (AEDs) used to treat victims of sudden cardiac arrest. Untreated sudden cardiac arrest is a leading cause of death in occupational settings, according to OSHA, with the agency estimating about 10,000 sudden cardiac arrests occur at work each year.

To communicate the latest knowledge about resuscitation for application in emergency situations, the American Heart Association (AHA) in 2010 updated its Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science for implementation in 2011.

In these most recent guidelines, AHA emphasizes the importance of chest compressions at a rate of 100 per minute. This "hands only" method of providing CPR was recommended after medical studies demonstrated that fast, 2-inch deep chest compressions to adult victims are associated with survival with good neurologic function. While the 30:2 ratio of chest compressions to rescue breaths is still recommended, the emphasis now is on initiating chest compressions before rescue breathing, delivering them without interruption, and allowing full chest recoil after each compression.

Another guideline that often goes unnoticed is that the AED should be used as soon as possible, rather than after CPR. Previous guidelines directed rescuers to provide one and a half to three minutes of CPR before placing the AED pads on the victim. “Shock first” is now recommended because “speed to shock” is associated with higher survival rates. About 90 percent of sudden cardiac arrest victims shocked within the first few minutes after arrest survive, and survival rates decline with each passing minute. Only about 10 percent of victims shocked after 10 minutes survive.

The guidelines help to further refute a few common myths of sudden cardiac arrest, CPR, and AEDs still alive in many workplaces.

**Myth 1: CPR alone can save a sudden cardiac arrest victim.** CPR should be provided only until the time an AED is available because only an AED can determine whether or not a patient’s heart is arrhythmic and provide defibrillation. CPR alone cannot save a sudden cardiac arrest’s victim’s life; it can only buy time.

**Myth 2: An AED is not needed; just call EMS.** While EMS personnel have the knowledge and tools needed to save a sudden cardiac arrest victim, they often simply cannot reach the victim quickly enough. According to a USA Today investigative report, EMS responders usually take from six to 12
minutes to treat a sudden cardiac arrest victim. For the best chance of survival, a victim should be treated in less than three to five minutes. Most untreated sudden cardiac arrest victims die within 10 minutes.

Myth 3: AEDs malfunction often. The Food and Drug Administration has recognized the effectiveness of AEDs in saving lives. According to The New York Times, Dr. Bram D. Zuckerman, director of the division of cardiovascular devices in the FDA Office of Device Evaluation, said that "there's no question these are life-sustaining, life-saving devices." The number of device malfunctions is small compared to the number of the times AEDs are used without malfunction or to save a sudden cardiac arrest victim's life. An estimated 15,000 to 20,000 Americans have their lives saved by an AED each year.

Myth 4: AEDs are complicated instruments that are difficult to use. A University of Washington study demonstrated that the average sixth grader can operate an AED successfully. Non-medical volunteers, including workplace response teams, represent the largest group of people using AEDs, according to a study by the Resuscitation Outcomes Consortium. Indeed, several scientific studies have demonstrated that public-access AEDs used by non-medical responders are increasing the numbers of sudden cardiac arrest survivors more than any other kind of medical intervention.

Recent Medical Studies Drove Changes

Before the publication of the 2005 AHA Guidelines for CPR and ECC, two studies suggested a potential benefit of providing CPR before providing a shock with an AED. However, prior to the publication of the 2010 guidelines, two newer studies found that CPR prior to defibrillation was not associated with a higher survival rate. And in August 2011, a study published in the New England Journal of Medicine showed that extending the time CPR was provided prior to AED treatment did not improve outcomes.

In many real-life rescue situations, one rescuer can provide CPR while another person retrieves the AED. In this way, CPR can still be provided pre-shock without delaying the speed to shock. Rescuers should initiate chest compressions before giving rescue breaths, following the 100 compressions per minute and 30:2 ratio of compressions to rescue breaths, the guidelines advise.

Consistent with the emphasis on chest compressions, the "look, listen and feel for breathing" guideline was removed from the CPR sequence in the 2010 guidelines. The CPR sequence now begins with compressions if the victim is unresponsive, not breathing, or only gasping; after the first set of chest compressions, the airway is opened and the rescuer delivers two breaths.

There is no timeframe for providing CPR prior to AED treatment. Responders should continue to provide CPR until an AED or EMS arrives. The AED checks the heart rhythm and provides a shock if the heart is arrhythmic. After each shock, the rescuer should provide CPR for two minutes before the AED checks the heart rhythm and provides another shock if necessary.

Defibrillation Waveforms and Energy Levels

The latest guidelines also clarify an industry debate by declaring it is not possible to recommend a definitive biphasic energy level for first or subsequent shocks. The guidelines state, "Data from both out-of-hospital and in-hospital studies indicate that biphasic waveform shocks at energy settings comparable to or lower than 200-J monophasic shocks have equivalent or higher success for termination of VF (ventricular fibrillation). However, the optimal energy for first-shock biphasic waveform defibrillation has not been determined. Likewise, no specific waveform characteristic (either monophasic or biphasic)
is consistently associated with a greater incidence of ROSC (return of spontaneous circulation) or survival to hospital discharge after cardiac arrest."

**Training and Equipping Response Teams**

Your AEDs' audio and video instructional prompts must match the latest guidelines. Make sure your AED manufacturer offers software updates that can make an AED's audio and video prompts current. For example, your audio and video instructions must direct users to provide compressions before rescue breaths and to use the AED as soon as possible.

In addition, refreshing your response team's CPR/AED training certification will bring them up to date with the latest knowledge about resuscitation incorporated into the five-step chain of survival: call 911, early CPR, rapid defibrillation, effective advanced life support, and integrated post-cardiac arrest care. For example, they will learn how to do 100 deep chest compressions per minute and how to fit the appropriate amount of rescue breathing into an emergency response.

Some AED manufacturers produce AEDs that can serve as training aids, with one model providing video and voice coaching and on-demand video help. This feature enables the workplace response team to practice after receiving certification training and to gain confidence before responding to a real-life emergency.

Because many incidents of sudden cardiac arrest occur in the workplace, it's important for employers to have up-to-date AED/CPR programs. To accomplish this objective, each workplace should have a point person who is responsible for making sure AEDs are properly maintained. This program manager also should make sure that response team members are certified and re-certified with refresher courses and that the program meets all other state and local requirements. In addition, a medical professional with expertise in emergency response, such as a physician, nurse, or EMS professional, should oversee your AED program.

It's likely that the American Heart Association will update its guidelines again either in or before 2015 as new knowledge about resuscitation science is discovered. By that time, AEDs will be even more commonplace and expected by your employees and customers. Now is the time to implement or update your AED program, before a sudden cardiac arrest occurs in your workplace. By being prepared, you can turn a tragedy into a celebration. Rather than having to deal with the unpleasant aftermath of an employee's death, you can experience the satisfaction that goes along with saving a colleague's life.