

AED Lifesaving Equipment by Mark Blank

AED's – Automated External Defibrillators, portable electric devices that deliver a shock to the heart, have become one of the most exciting rescue tools on the market today. They are used on people who have suffered Sudden Cardiac Arrest. Statistics have shown four out of five CPR attempts fail. These statistics also show that Sudden Cardiac Arrest patients suffering 'sudden chaotic heart rhythm' can only be revived using electric defibrillation. According to the American Heart Association CPR rescue attempts using electric defibrillation or AED's improves survival rates by as much as 49%!

Facts on Sudden Cardiac Arrest (SCA)

- On an average day in the United States 1,000 adults die from Sudden Cardiac Arrest (SCA), a total of 350,000 per year. SCA is the result of an arrhythmia, where the electrical pulse of the heart goes out of control, causing the heart to quiver. Doctors don't understand why this happens, but they do know that shocking the fibrillating heart is the only effective treatment for regaining a regular beat.
- The American Heart Association estimates that 20,000 to 100,000 SCA deaths could be prevented each year if defibrillation was readily available. Electrical shock restores a heartbeat and circulation, but to survive neurologically intact, rescue must be swift. (Wall Street Journal)
- Defibrillation within the first minute of sudden cardiac arrest can save the lives of up to 90% of its victims. However, with each minute of delay until defibrillation, the survival rate drops by 10% (American Heart Association)

AED Popularity

AED's have received an enormous amount of publicity from major media outlets to local papers. AED's are finding their way into police cars, fire trucks, airports, sporting venues, swimming and athletic facilities, golf courses, shopping malls, corporate office buildings, off-shore businesses, schools and anywhere where people work and live where rescue response time is greater than four minutes.

"It will be very reasonable to assume that within the next five to ten years, most people will know how to use a machine like this," says Ramin Ebrahimi, a cardiologist and professor from the University of California—Irvine.

American Airlines was the first major US airlines to stock AED's. Of the first eight American Airline passengers who were given shocks to restart their hearts, six survived. United, Delta, and US Airways should be fully equipped this month. Chicago O'Hare International and Midway airports are the first in the country to make AED's available for emergency public use in their terminals. The Federal Aviation Administration is currently under a congressional mandate to decide whether AED's should be mandatory on all air carriers and at all airports, (Convener)

Eventually, public facilities not having a device on site could face a liability risk. Busch Gardens was found negligent for failing to properly respond to a cardiac arrest because personnel lacked essential medical equipment – including an automated defibrillator. (US News and World Report)

What Are AED's?

AED's are lifesaving devices, which are used by minimally trained rescuers to save victims of Sudden Cardiac Arrest. They are small, almost lunch-box-sized versions of their cousin defibrillators that are found in hospitals and advanced care ambulances. Unlike their larger cousins, that need to be plugged-in and operated by trained medical personnel, AED's are small, lightweight, run on a lithium battery and automatically determine whether the patient needs defibrillation. A computer chip employs "talk-you-through" technology that actually speaks to the operator guiding him

or her through a few simple steps. They're so simple that even a child can be trained on the use of an AED.

Safety and Operation

A common misconception about AED's is their use around pools and wet areas. One would suppose that you should not mix electricity and water, but AED's are safe for pool deck areas with common sense precautions. Victims should be moved to a dry area of the deck, and wiped down with a towel before applying an AED. A feature common on most AED's is an internal voice that instructs rescuers when to administer CPR and when to stand back while the AED delivers each shock.

AED Features

A number of AED's are now available and as they vary in price they also vary in features and performance. When choosing an AED, the decision-maker should look at the features and benefits before looking at the price tag. Important considerations in choosing an AED are:

- Simplicity of operation. When an emergency occurs, the rescuers should not have to read through lengthy directions and waste precious time, everything should be clearly marked – plain and simple.
- AED's with 'one-button operation' are the easiest to use.
- Clear, concise voice prompts should guide the user through the steps of defibrillation.
- A simple drawing should show the user exactly where to attach the self-adhesive electrode pads.
- The case should be durable and its color should make it easy to locate.
- Battery life is also important. A battery or portable power supply should be guaranteed for at least two years without the need for charging, enabling maintenance free operation. The ideal AED has a five-year lithium battery that is stored in the unit, insuring that the AED is always ready to perform in an emergency.
- Non-polarized pre-attached electrodes are a positive feature.
- Conformance of AED operation to American Heart Association protocols.
- The AED should be programmable to meet your medical directors recommended protocols.
- Event recording and data management are important in keeping a "paper trail"
- Features such as waveform (biphasic and monophasic) and incremental energy levels are also important. Check with medical directors as to waveform and energy levels prescribed. Most AED's are available in both monophasic and biphasic waveform models so they can be programmed to meet any protocol. American Heart Association currently recommends 200, 300, and 360 joules. It is best to consult with your medical director or local EMS before choosing a monophasic or biphasic unit, or determining operating protocols.

The AED's designers should have addressed all of the factors that contribute to confusion and uncertainty at an emergency to develop a reliable AED. Ease of use creates confidence in the user, which helps to minimize the possibility of errors.

Training

AED's are Class II Medical Devices and must be used by trained personnel under the care of a physician. This means someone on staff must have training and a physician must issue a prescription for the facility to purchase an AED. Call Kiefer and Associates or your local American Heart Association, Red Cross or National Safety Council to assist in locating medical direction or training. Training is available through several organizations. The standard program requires a CPR certificate and three hours of AED instruction.

Training Resources

Adolph Kiefer and Associates 1-800-323-4071, or on-line at: www.kiefer.com.

American Heart Association – see local director

National Safety Council – contact local affiliate

American Red Cross – contact local affiliate

Educational Resources

Nissha Chandra, MD and Mary Fran Hazinski, MSN, RN, "Basic Life Support for Healthcare Providers," American Heart Association, Dallas, Texas, 1994

Marilyn Chase, "More Workplaces Make Defibrillators Part of First-Aid Kit, " The Wall Street Journal, 1998

Kathleen Doheny, "More Airlines Bring Portable Defibrillators On Board, " Convene, 1999

David L. Hebert, Esq., "Heart in the Right Place," American Fitness, 1999

National Safety Council, "Automated External Defibrillation," Boston, Jones and Bartlett Publishers, 1998

Mary May Newman and Jim Christenson, MD, "Challenging Sudden Death: A Community Guide to Help Save Lives: Catalyst Research & Communication, Carmel, Indiana

Rachel K. Sobel, "A Shocking Story: Handy Defibrillators: U.S. News & World Report, 1998

Myron L. Weisfedlt, MD, Chairman, "Public Access Defibrillation," Task Force on AED, American Heart Association, Dallas, Texas, 1995

Reviewers

Thank you to pool managers and safety specialists Pat Fosella, Debbie Dorsey, Roxy Lloyd, and Lynda Kuhne for assistance with this article.

Author

Mark Blank is a writer in the Chicago area who has written numerous articles on health and safety issues for various health, sports, fire/rescue publications.