City of Grand Island

Tuesday, July 01, 2003
Study Session

Item -1

Presentation Regarding Public Access to Defibrillation

Cardiac arrest claims the lives of 220,000 people each year. Automated external defibrillators (AEDs) make it possible for trained lay rescuers to deliver defibrillation. Chad Bluschke with the Grand Island Fire Department will demonstrate the automated external defibrillator and explain the programs in place to make defibrillators accessible to the public.

Staff Contact: Jim Rowell

The Case for Public Access Defibrillation (PAD) Programs

American Heart Association®
Fighting Heart Disease and Stroke

About 220,000 people die each year from sudden cardiac arrest. That's 600 a day — an average of 25 per hour.

Cardiac arrest usually results from some underlying form of heart disease. Most cardiac arrests are due to abnormal heart rhythms called arrhythmias. Ventricular fibrillation (VF) is the most common arrhythmia that causes cardiac arrest. VF is a condition in which the heart's electrical impulses suddenly become chaotic, often without warning. That causes the heart's pumping action to abruptly stop. When cardiac arrest occurs, the victim loses consciousness, has no pulse and stops breathing normally. Death follows within minutes.

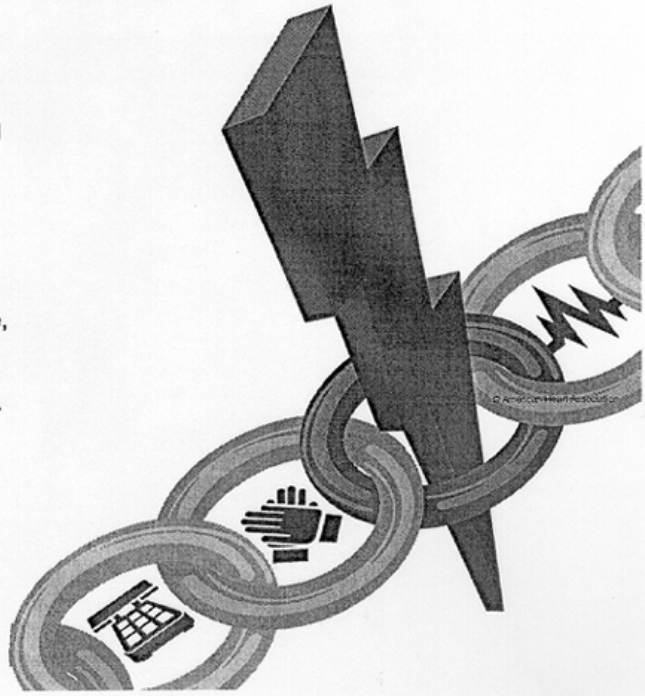
Defibrillation is the only known therapy for VF. This technique of giving an electrical shock can restore the heart's normal rhythm if it's done within minutes of the arrest. For every minute that passes without defibrillation, a victim's chances of survival decrease by 7–10 percent. After as little as 10 minutes, very few resuscitation attempts are successful.

Traditionally, the ability to defibrillate was solely in the hands of emergency medical personnel. They were trained to interpret arrhythmias and determine when a shock was needed. Survival depended on the Emergency Medical Services (EMS) system being contacted and arriving quickly.

Unfortunately, quick EMS response isn't always possible. Even the very best EMS systems experience delays from heavy traffic, secured buildings, gated communities, large building complexes and high-rises. For example, in New York City where emergency response teams fight extreme traffic, the average arrival time for emergency vehicles is about 12 minutes. Not surprisingly, the cardiac arrest survival rate is less than 2 percent.

Today a new generation of defibrillators, called automated external defibrillators (AEDs) make it possible for trained lay rescuers to deliver defibrillation. The new AEDs are safe, effective, lightweight, low maintenance, easy to use and relatively inexpensive (about $3,000 each). Having trained lay rescuers equipped with AEDs in settings where large numbers of people congregate saves precious minutes and improves survival rates for cardiac arrest victims. Facilities such as high-security companies, sports arenas, large hotels, concert halls, high-rise buildings, gated communities, sprawling manufacturing plants and remote sites can benefit from obtaining AEDs and training employees to use them as part of a public access defibrillation (PAD) program.

The American Heart Association strongly encourages establishing PAD programs as an important way to save the lives of thousands of cardiac arrest victims. The materials in this package will help you make a decision about obtaining AEDs and making them safe and effective to use by establishing a public access defibrillation program.



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CPR and AEDs

Questions and Answers About AEDs

General Questions

What does AED stand for?

AED stands for automated external defibrillator (or automated external defibrillation).

What's an AED?

An AED is a device used to administer an electric shock through the chest wall to the heart. Built-in computers assess the patient's heart rhythm, judge whether defibrillation is needed, and then administer the shock. Audible and/or visual prompts guide the user through the process.

How does an AED work?

A microprocessor inside the defibrillator interprets (analyzes) the victim's heart rhythm through adhesive electrodes (some AED models require you to press an ANALYZE button). The computer analyzes the heart rhythm and advises the operator whether a shock is needed. AEDs advise a shock only to ventricular fibrillation and fast ventricular tachycardia. The electric current is delivered through the victim's chest wall through adhesive electrode pads.

Why are AEDs important?

AEDs are important because they strengthen the Chain of Survival.

They can restore a normal heart rhythm in victims of sudden cardiac arrest. New, portable AEDs enable more people to respond to a medical emergency that requires defibrillation. When a person suffers a sudden cardiac arrest, their chance of survival decreases by 7% to 10% for each minute that passes without defibrillation. AEDs save lives!

Who can use an AED?

Most AEDs are designed to be used by nonmedical personnel such as police, firefighters, flight attendants, security guards, and other lay rescuers who have been properly trained. Having more people in the community who can respond to a medical emergency by providing defibrillation will greatly increase sudden cardiac arrest survival rates.

Why does someone having a heart attack need an AED?

When a heart attack becomes a full cardiac arrest, the heart most often goes into uncoordinated electrical activity called fibrillation. The heart twitches ineffectively and can't pump blood. The AED delivers electric current to the heart muscle, momentarily stunning the heart, stopping all activity. This gives the heart an opportunity to resume beating effectively.

Will an AED always resuscitate someone in cardiac arrest?

The AED treats only a heart in ventricular fibrillation (VF), an irregular heart rhythm. In cardiac arrest without VF, the heart doesn't respond to electric currents but needs medications. The victim needs breathing support. AEDs are less successful when the victim has been in cardiac arrest for more than a few minutes, especially if no CPR was provided.

AED Use

Is an AED safe to use?

An AED is safe to use by anyone who's been trained to operate it. Studies have shown the devices to be 90% sensitive (able 90% of the time to detect a rhythm that should be defibrillated) and 99% specific (able 99% of the time to recommend not shocking when defibrillation is not indicated). Because of the wide variety of situations in which it will typically be used, the AED is designed with multiple safeguards and warnings before any energy is released. The AED is programmed to deliver a shock only when it has detected VF. However, potential dangers are associated with AED use. That's why training — including safety and maintenance — is important.

The AHA recommends that persons who live or work where an AED is available for use by lay rescuers participate in a Heartsaver AED Course. AEDs are so user-friendly that untrained rescuers can generally succeed in attaching the pads, pressing ANALYZE (if required), and delivering shocks. However, untrained rescuers may not

know when to use an AED, and they may not use an AED safely, posing some danger of electric shock to themselves and others. Also, untrained rescuers probably would not know how to respond to the victim if the AED prompts "no shock indicated." An operator needs only to follow the illustrations on the electrode pads and the control panel and listen and follow the voice prompts (for example, "Do not touch the patient."). An AED will deliver a shock only when a shock is advised and the operator pushes the SHOCK button. This prevents a shock from being delivered accidentally.

Are AEDs safe to use on children?

An AED should not be used on a child younger than 8 years old or weighing less than about 55 pounds. For more information on this question click here: AEDs and Children.

Will I get zapped if I shock a victim in the rain or near water?

It's remotely possible to get shocked or to shock bystanders if water is standing near or underneath the patient. Try to move the patient to a dry area and cut off wet clothing. Also be sure that the skin has been toweled dry so the electrode pads will stick to the skin. At the moment you press the SHOCK button, you must make sure that no one, including yourself (the AED operator), touches any part of the victim.

Can an AED make mistakes?

An AED will almost never decide to shock an adult victim when the victim is in non-VF. AEDs "miss" fine VF only about 5% of the time. The internal computer uses complex analysis algorithms to determine whether to shock. If the operator has attached the AED to an adult victim who's not breathing and pulseless (in cardiac arrest), the AED will make the correct "shock" decision more than 95 of 100 times and a correct "no shock indicated" decision more than 98 of 100 times. This level of accuracy is greater than the accuracy of emergency professionals.

Why do you stop CPR as the electrode pads are placed and analysis occurs?

For the AED to analyze accurately, the victim must be motionless. Sometimes there will be an agonal respiration (a gasping breath that can occur when the heart is stopped) that causes some movement. AEDs can recognize this extra motion and indicate "motion detected" to the operator. This warns the operator to assess carefully for extra movements from the victim or other people at the scene.

Why should a lay rescuer continue CPR after the arrival of emergency medical services (EMS) professionals?

It's helpful to EMS professionals to be able to set up their equipment, including the defibrillator, while lay rescuers continue CPR. The EMTs will take over CPR and reconfirm that the victim is in cardiac arrest.

Why does it seem that the victim goes without CPR for so long during defibrillation, and why does an AED shock so many times?

After prescribed periods of CPR, the machine analyzes the victim's rhythm. The victim must remain motionless while the AED decides to shock and delivers the shock. Sometimes the victim doesn't change from VF to non-VF at once. These victims require multiple shocks. If repeated shocks are needed, the shocks are "stacked" in sets of three to increase their effectiveness.

Besides using an AED, how else might a lay rescuer help at the scene of a sudden cardiac arrest?

Lay rescuers are most often asked to call 911 and get the AED. The lay rescuer can assemble the pocket face mask and begin providing mouth-to-mask ventilations. Responders might provide CPR or continue defibrillation if a workplace defibrillator is used. Support and direction to bystanders, friends, and family are appropriate. When EMS personnel arrive, the lay rescuer can provide directions and help get information about the patient.

What actions should a CPR responder take after using an AED on a person in cardiac arrest?

There should be some type of debriefing for EMS personnel or lay rescuers involved in a resuscitation attempt. Also, the voice-rhythm-shock record should be collected from the AED's event documentation system. The AHA strongly recommends that AEDs used in a public access or home-responder setting have both rhythm and voice event documentation. AEDs can record and store (as a minimum) the following information:

- Patient rhythm throughout the resuscitation.
- Response of the AED (shock versus no shock; shockable rhythm versus nonshockable rhythm).
- Event and interval timing.
- Audio recording of the voices and actions recorded at the scene of a cardiac arrest.

AED Placement

What's public access to defibrillation?

Public access to defibrillation (PAD) means making AEDs available in public and/or private places where large numbers of people gather or people who are at high risk for heart attacks live.

What's the AHA position on placement of AEDs?

The AHA strongly advocates that all EMS first-response vehicles and ambulances be equipped with an AED or another defibrillation device (semiautomatic or manual defibrillator). The AHA also supports

placing AEDs in targeted public areas such as sports arenas, gated communities, office complexes, doctor's offices, shopping malls, etc. When AEDs are placed in a community, the AHA strongly encourages that they be part of a defibrillation program in which

- Persons or entities that acquire an AED notify the local EMS office.
- A licensed physician or medical authority provides medical oversight to ensure quality control.
- Persons responsible for using the AED are trained in CPR and how to use an AED.

Why is notifying the local EMS office important?

It's important for the local EMS system to know where AEDs are located in the community. In the event of a sudden cardiac arrest emergency, the 911 dispatcher will know if an AED is on the premises and will be able to notify the EMS system as well as the responders already on the scene.

Why should a licensed physician or medical authority be involved with purchasers of AEDs?

This is a quality control mechanism. The licensed physician or medical authority will ensure that all designated responders are properly trained and that the AED is properly maintained.

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. The ventilation and compression skills learned in a CPR class help to circulate oxygen-rich blood to the brain. After delivering a series of three electric shocks, the typical AED will prompt the operator to continue CPR while the device continues to analyze the patient.

If AEDs are so easy to use, why do people need formal training in how to use them?

An AED operator must know how to recognize the signs of a sudden cardiac arrest, when to activate the EMS system, and how to do CPR. It's also important for operators to receive formal training on the AED model they will use so that they become familiar with the device and are able to successfully operate it in an emergency. Training also teaches the operator how to avoid potentially hazardous situations.

Can anyone buy an AED?

AEDs are manufactured and sold under guidelines approved by the Food and Drug Administration. Current FDA rules require someone who purchases an AED to present a physician's prescription for the

device.

My health club has identified a member physician willing to purchase an AED for the club. What's the first step in the process?

Your local EMS system can help you find out about local and state protocols and requirements for AED training and use.

The police are the first responders in my community. Officials are reluctant to have them carry and use AEDs for fear of potential litigation. What legislation is currently in effect to protect first responders who use an AED?

If the person is a trained and licensed medical first responder (MFR), an established standard of care is outlined in the law, and those operating within these guidelines are protected under these laws. These same guidelines pertain to the personnel in your EMS system. If they are not trained and licensed MFRs, check the state laws to determine if lay rescuers are given limited liability immunity. If not, they may not be protected from litigation. Agencies should seek legal counsel before implementing a defibrillation program.

How much does an AED cost?

The price of an AED varies by make and model. Most AEDs cost around $3000.

What steps should an organization take to buy an AED for its premises?

Any person or entity wanting to buy an AED must first get a prescription from a physician. The AED should be placed in use within a defibrillation program that includes these elements:

- Training of all users in CPR and operation of an AED (AHA Heartsaver AED Course).
- Physician oversight to ensure appropriate maintenance and use of the AED.
- Notification of local EMS of type and location of AED.

Which AED model does the AHA recommend?

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. The AHA encourages potential buyers to consider all models and make a selection based on the buyer's particular needs. The local EMS system can help you with this decision.

Training

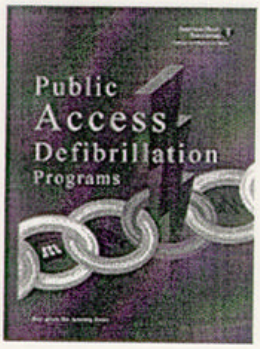
How can I enroll in a CPR or AED class?

The American Heart Association offers CPR and AED training through community training centers (CTCs). To locate a CTC, call your nearest AHA office or ECC consultant, or click here to Find a Course Near You.

What kind of training on AEDs is available?

The AHA has developed a new Heartsaver AED Course that integrates CPR and AED training. The course is 3½ to 4 hours long.

Public Access Defibrillation



- The Case for PAD Programs
- Quick Overview on Establishing a PAD Program
- Lay Rescuer Training
- Physician Oversight
- Integrating With the EMS System
- Using and Maintaining an AED
- Placing AEDs-Where and How Many?
- Follow-up After an AED Is Used
- PAD Program Legal Issues
- Promoting a PAD Program
- Q & A About AEDs and Defibrillation
- More Q & A About AEDs and Defibrillation
- Sample Notification Letter to City EMS Director
- Sample PAD Program Announcement News Release
- AED Maintenance Checklist

To view and read the above documents, you will need the Adobe Acrobat Reader. If your computer is not already configured to view PDFs (portable document files), you may download free, either the Macintosh or PC version from adobe.com. Note: To print pages off the PDF, print them from the Adobe Acrobat Reader application using the Adobe Acrobat Reader tool bar or print menu.

Who is at Risk?

About 95% of all SCA victims die – about 1000 lives each day in the U.S.

Although the average age of victims is 65, SCA can strike...

Any time,

Any place,

Any body.

Eisenberg W. American Journal of Emer Med. 1998;16:315-319.
Cobb LA. Circ. 1992;85:1814-182.

SCA - Who is at Risk?

Risk Factors:

- Previous Heart Attack
- Previous SCA Event
- Fast Rhythm in Lower Part of Heart
- Family History of SCA
- Heart Failure

- Visit Your Doctor and Discuss Your Medical Condition

Julie's Story

- Julie experienced a SCA during dinner at a restaurant
- Julie's husband started CPR
- Police Officer answering the 911 call used his AED to resuscitate Julie
- Paramedics provided advanced care

Key to Surviving SCA

Early Defibrillation

- Only effective treatment is an electrical shock delivered by a defibrillator.
- Time is critical – each minute of delay before defibrillation reduces survival by about 10%.

Eisenberg MS. Annuals Emerg Med. 1990;19:179-186.

What is an AED?

- Device that looks for shockable heart rhythms
- Delivers a defibrillation shock if needed
- Small, portable, size of laptop computer
- Simple, automatic

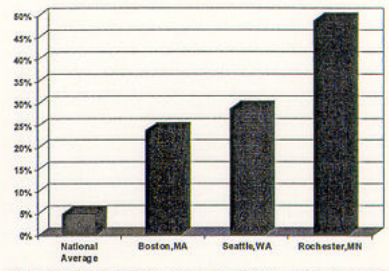
Who Can Use an AED?

- Anyone who has taken a nationally recognized CPR course and is trained on the operation of the AED
- Four- to six-hour training courses offered by the American Heart Association, National Safety Council, American Red Cross and other organizations

Who is Using AEDs?

- Police
- Firefighters
- EMTs
- Security Officers
- Emergency Response Teams
- Flight Attendants
- Golf Pros
- Lifeguards
- Ski Patrol
- Health Club Employees

AEDs Improve Survival



White RD. Ann Emer Med. 96;28:480-485. Cobb LA. Circ. 92;85:58-102. Smith SC. Circ. 97;13:1321-1324.

Survivors are at High Risk

- 30-50% of Sudden Cardiac Arrest survivors will experience another arrest within one year.
- Proper treatment can improve the odds of surviving future SCA events.

AVID Investigators. N Engl J Med. 1997;337(22):1576-1583.
Myerburg RJ. Heart Disease, A Textbook of Cardiovascular Medicine. 5th ed. Vol 1. Philadelphia: WB Saunders Co;1997:ch. 24.

Heart Rhythm Specialists

- Electrophysiologists (EPs) are Cardiologists with specialized training in the diagnosis and treatment of heart rhythm problems.

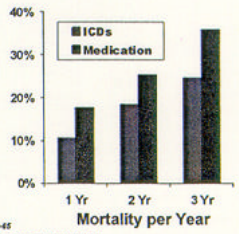
Treatment for SCA Survivors – Implantable Cardioverter Defibrillator

- Internal device that monitors your heart and can deliver an electrical shock that brings the heart back into a normal rhythm
- Implanted in a one-hour procedure
- Many patients leave the hospital the following day

Preventing SCA with ICDs

Clinical Studies have shown that:

- ICDs are 99% effective in treating SCA
- ICDs reduce mortality over medications



PCD Investigators. Circulation 1995;92(1):59-65
Adapted from AVID Investigators. N Engl J Med. 1997;337(22):1575-1583.

Looking Forward to the Future

Sudden Cardiac Arrest

- ✓ What is it?
- ✓ What if it happens?
- ✓ Can you prevent it?

Are You and Your Community Heart Safe?

There is something you can do!

CITY OF GRAND ISLAND

Fire Department

Working Together for a Better Tomorrow. Today.

AED Locations:

Evangelical Church
Fonner Park Keno
Conestoga Mall
Grand Island Senior High
Saint Francis Medical Center – Skilled Care
Stuhr Museum
Jack Rabbit Run
Fonner View Golf Course
Riverside Golf Course
Overhead Door
St. Paul Lutheran Church
Employer Health Care
McCain Foods
New Holland
Chief Auto and Fabrication
Dept. of Treasury
Pioneer Hi-Breeds – Doniphan
Hall County Jail
Platte Generating Station
Trinity Lutheran Church
Central Community College
YMCA
YWCA
Salvation Army

The names in bold type are AED's placed by Project Heartsave. The names in italic are AED's that will be in place by the end of July from Project Heartsave.

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