

**The Bill Blackwood
Law Enforcement Management Institute of Texas**

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**Automated External Defibrillators AED'S
Should Patrol Officers be furnished With Them?**

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**An Administrative Research Paper
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ABSTRACT

Throughout the United States sudden cardiac arrest (SCA) strikes over 350,000 people each year making it the single most common event leading to death. Survival from sudden cardiac arrest depends on a strong Chain of Survival. This includes early access of the EMS system, early CPR, early defibrillation (Automated External Defibrillation), and early advanced life support. Early defibrillation has been called the critical link in the Chain of Survival, since the time from collapse to defibrillation is the key indicator of survival from a cardiac arrest. When the call for help is made and it involves a person suffering from cardiac arrest, law enforcement should be ready and equipped to handle such a call. Police Officers are usually the first to arrive on the scene. Their ability to use the Automated External Defibrillator (AED) can be the greatest chance at survival the victim has. Many police departments have started to train their officers in the use of AEDs and have made them standard equipment in their patrol units. There have been many documented cases in which the AEDs have helped police officers to act quickly and save the lives of victims of sudden cardiac arrest.

TABLE OF CONTENTS

	Page
Abstract	
Introduction.	1
Review of Literature.	2
Methodology	7
Findings.	8
Discussions/Conclusions	11
References.	15

INTRODUCTION

When responding to medical emergency situations it has long been known that time is very critical. The earlier someone can get involved with a victim suffering from cardiac arrest the greater the chances of survival becomes. Police Officers, by being first responders, play a key role to a victim's survival. Police Officers are trained in First Aid and CPR and are limited in the amount of medical care they can give a person. By officers trained in the use of the Automated External Defibrillator (AED) and having the AED in their patrol unit, police officers on the street are now able to administer a life saving shock to the heart of the victim, greatly increasing their chances of surviving a cardiac arrest.

It is reported by the National Center for Early Defibrillation (NCFED) [online] (www.early-defib.org) that numerous scientific studies conducted in the past two decades have proven that rapid defibrillation is the single most important factor affecting survival from sudden cardiac arrest in adults. This research, coupled with important technology advances, has driven the international movement to increase access to early defibrillation. The AED is a safe and effective device and is nearly 100% accurate in the detection of ventricular fibrillation and detection of a nonshockable rhythm.

Today, AED's are not limited to emergency medical personnel only. "The placement of AED's in the hands of large number of people trained in their use may be the key intervention to increase the survival chances of out-of-hospital cardiac arrest patients (JAMA. 1992;268:2291.) EMT's firefighters, police officers, airports, amusement parks, schools, and other public locations should have AEDs available and someone trained in the use of AEDs so they can stand by

ready and willing to get involved, because cardiac arrest can affect anyone, anytime.

The intended audience for this research paper is the police department this author is employed with and the city council. The author anticipates to educate them in the importance of training with AEDs and being able to carry this life saving tool while out on patrol. With the AED, police officers can now assist and serve the community in more than a law enforcement role. The author will answer the question "Should patrol officers be furnished with AEDs?" by conducting a research to try and determine how many other departments are using the AEDs, the laws that affect the use of AEDs, technology on the reliability of the AEDs and the effectiveness on having an AED inside a patrol unit.

REVIEW OF LITERATURE

Many police officers today are not yet familiar with the Automated External Defibrillators (AEDs) or how AEDs operate. It can be found at The Bakken Library and Museum [on-line] (www.thebakken.org) that the first difibrillator was built by James Rand in 1947 when Claude Beck used it to resuscitate a 14-year-old boy whose heart was in fibrillation by open-chest massage and alternating current internal defibrillation. Also nine years later in 1956 Paul Zoll used a more powerful unit to accomplish the first closed chest defibrillation.

Controversy over the benefits of DC vs. AC Defibrillation took place in 1962. It was not until 1986 that firefighters with basic training began using AEDs. In 1955 the American Heart Association (AHA) made public statement that Public Access Defibrillation (PAD), "early bystander CPR and rapid AED use contribute

to survival of sudden cardiac arrest (SCA)." (Call Clear & Shock [on line] aed_doc@defib.org)

In 1997 the International Liaison Committee on Resuscitation (ILCOR) made a statement that defined a first responder as "a trained individual acting independently with a medical controlled system. . .may include police, security officers, lifeguards, airline cabin attendants, railway station personnel, volunteers who render first aid, and those assigned to provide first aid at their work place and who are trained in the use of AEDs" (Call Clear & Shock [on line] aed_doc@defib.org) The first uses of the Automatic External Defibrillator (AED) by police officers are traceable to unrelated programs during 1990 in a rural Pennsylvania township and in Rochester, Minnesota (Hall, 1999). In 1995 Alonso-Serra, Delbridge, Auble and Mosesso conducted a survey of 540 police departments around the United States and asked what percentage of departments actually responded to medical emergencies. "Responses indicated that 442 (80.7%) agencies responded to one or more specific types of medical emergencies and 263 (50.3%) provided some type of patient care" (Alonso-Serra et al, 1997, p.497). Alonso-Serra further found that law enforcement officers arrived on the scene of medical emergencies approximately 81% of the time before EMS. Of the officers arriving at medical emergencies first, the survey also found that only 14% used AED. It also found that 60% indicated that their police officers would be willing to learn more about medical emergency response. Alonso-Serra clearly shows that the majority of police departments are responding to medical emergencies, but few are equipped to handle cardiac arrests. (Rodolfo Muzquiz, ALR Paper, 2001) A reason for this type of result

could be the cost of the AED. In 1998 cardiac arrest was the leading cause of death according to the American Heart Association (AHA), beating out traffic accidents.

Although Automatic External Defibrillators have been around since 1947 they have become smaller and more affordable and easier to use. The AEDs cost about the same as a computer (\$2,500.00 to \$3,000.00). With its warranty and five-year battery, an AED offers a very low cost of ownership through the life of the AED. Because Automatic External Defibrillators are now affordable and easy to use, they have been in places like shopping malls, major airlines, casinos, private industry, schools, sport arenas, stadiums, etc. Training for AEDs has now been incorporated in the American Heart Association's CPR training programs and takes a minimal amount of time for the student to become proficient in its use. The Automatic External Defibrillator has both voice and screen messages that guide the rescuer through the process.

Using the AED is relatively simple, incorporating three basic steps. Using standard CPR guidelines, the rescuer must determine that the patient is unresponsive, not breathing and has no pulse. Once these conditions have been determined, the rescuer must:

1. Turn on the AED.
2. The rescuer attaches the adhesive electrodes to the victims chest. The AED assesses and then interprets the victim's heart rhythm.
3. The rescuer follows the Automatic External Defibrillator's voice prompts or screen instructions.

If shock is advised, the voice prompts or screen instructions will tell the rescuer to press the "shock" button. The AED will not allow a shock to be given unless the victim needs it (AHA, [on-line] americanheart.org, 2000).

They are water-resistant and designed to survive in the trunk of a vehicle for years with a minimum of care. The AEDs are programmed to analyze themselves daily to ensure proper operation and require nothing more than a person to look at them to check for any maintenance-required signals.

In Texas, the use of Automatic External Defibrillators is governed by Section 1. Subtitle B, Title 9, Health and Safety Code, Chapter 779.

AUTOMATED EXTERNAL DEFIBRILLATORS. This chapter defines what an AED is, the training required for use of an AED, the maintenance of an AED, the requirements for notifying the local emergency medical services provider, a liability exemption, rules pertaining to the possession of an AED, and a hospital exemption.

Health and Safety Code, Section 779.001 defines an Automated External Defibrillator as a heart monitor and defibrillator that has received approval from the United States Food and Drug Administration and is capable of recognizing the presence or absence of ventricular fibrillation or rapid ventricular tachycardia and is capable of determining, without interpretation of cardiac rhythm by an operator, whether defibrillation should be performed, and on determining that defibrillation should be performed, automatically charges and requests delivery of an electrical impulse to an individual's heart; Health and Safety Code, Section 779.002 states that a person or entity that acquires a Automated External Defibrillator shall ensure that each user of the AED receives training given or

approved by the Texas Department of Health in cardiopulmonary resuscitation and use of the AED. A licensed physician must be involved in the training program to ensure compliance with the requirements of this chapter and the Texas Department of Health shall adopt rules establishing the minimum requirements for the training, and shall consider the guidelines for AED training approved by the American Heart Association, the American Red Cross, or another nationally recognized association; Health and Safety Code, Section 779.003 states that a person or entity that owns or leases an AED shall maintain and test the AED according to the manufacturer's guidelines; Health and Safety Code, Section 779.004 states that a person or entity that provides emergency care to a person in cardiac arrest by using an Automated External Defibrillator shall promptly notify the local emergency services provider; Health and Safety Code, Section 779.005 states that a person or entity that acquires an AED shall notify the local emergency services provider of the existence, location and type of AED; Health and Safety Code, Section 779.006 provides a liability exemption to persons or entities involved in the use of and training for the AED, unless their conduct willfully or wantonly negligent, or has not complied with the requirements of this chapter; Health and Safety Code, Section 779.007 states that a person or entity must have a prescription or other similar order from a physician in order to possess an AED; and Health and Safety Code, Section 779.008 states that this chapter does not apply to licensed hospitals.

In November 2000 President Clinton signed into law The Cardiac Survival Act (CASA) and the Rural Access to Emergency Devices Act (Rural AED bill). In these it expanded the "Good Samaritan" legal protections to persons who

purchase and use an Automated External Defibrillator in emergency situations when treating a victim of sudden cardiac arrest. (AHA, [on-line] americanheart.org, 2000)

METHODOLOGY

Should patrol officers be furnished with Automated External Defibrillators? This author believes that all patrol officers should be provided with an AED along with the training of CPR and that there needs to be an AED device inside most patrol units. Almost all police agencies talk about being more community oriented and this author cannot think of anything that will help each department accomplish this than to know each of their officers are equipped with a device that can save lives of their citizens.

A good example of this is a study which was conducted by the police in Miami, Dade County, Fl. where they provided 1,900 AEDs to 1,900 police officers. The officers kept the AEDs with them at all times and even took them home which enabled further community use of the devices. During the time period this was conducted there were 420 cardiac arrest calls and the police arrived first 56 percent of the time. Survival was 17.2 percent for 163 victims with ventricular fibrillation. The survival rate had been only 9 percent during the one-and-a-half years prior to this. Vinay Nadkarni, M.D., chairman of the American Heart Association stated, "The study demonstrates how training police and other lay responders to use AEDs can dramatically improve the outcome of sudden cardiac arrest."(AHA, [on-line] americanheart.org, 2002)

This author conducted a survey of 25 police departments while attending Law Enforcement Management Institute of Texas (LEMIT) in Module 1. These departments were of different sizes, most were police departments for a municipality, a couple were sheriff's departments and only one was a police department with a school district. All 25 departments responded. Each survey asked the same questions:

1. Does your department provide the AED for your police officers?
If not, do you believe this would be a valuable tool for your department?
2. What training did your officers receive for the AED?
3. Do you believe this training was adequate in utilizing the AED?
4. Do you believe the AED is a valuable tool for law enforcement?
5. Does your department have routine maintenance checks for the AED?

The survey did show the lack of knowledge by a majority of police officers about the Automated External Defibrillator but a willingness to learn more about this device. Two the officers in the survey did speak about being there when the AED was used and a life was saved and the fulfillment they got from being a part of this.

FINDINGS

Of the twenty-five police departments surveyed it was shocking to find that only six departments provided AEDs to its police officers. When asked how many thought the AEDs were a valuable tool, again it was shocking to find out that only sixteen said "yes" and seven said "no". (Figure 1) This survey clearly shows that

many police departments and their officers need to be educated about the Automated External Defibrillator and encouraged to train and carry the AED while performing their daily duties. As a police officer you never know when someone may call and request help with a victim suffering from a cardiac arrest.

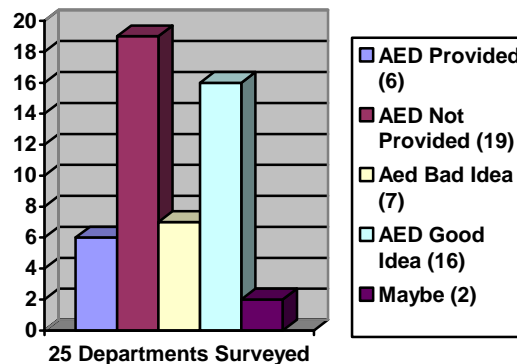


Figure 1

Keri Losavio who writes for The Journal of Emergency Medical Service stated "It is a well known fact that for every minute following sudden cardiac arrest, a victim's chance for survival decreases by 10% and defibrillation must occur within the first eight minutes to prevent brain damage." (Losavio, 2000, p.82). It was discovered that the most important factor when dealing with a person suffering from cardiac arrest was time. It is the police officer out on patrol that is generally first on the scene when someone needs help. The officer needs to be trained and equipped to handle emergency situations. The argument that AED's are too expensive and medical emergencies should be left to EMS or first responders does not hold water.

Broadly speaking, everyone who has a duty to respond to victims of sudden cardiac arrest should be trained and equipped to defibrillate. The

following is a list of things every community should do to strengthen the early defibrillation link:

1. Ensure that personnel in your community who have a duty to respond to victims of sudden cardiac arrest are trained and equipped to defibrillate.
2. Ensure that all ambulances and first response emergency vehicles such as fire trucks and police cars carry defibrillators.
3. Aim to reduce "call shock" time to five minutes or less in 90 percent of cases. (National Center for Early Defibrillation [on-line] www.early-defib.org)

Also found during researching on the Automated External Defibrillators was the issue of liability for those using the AED. The fact is the people who used the Automated External Defibrillator was no more at risk than someone who performed CPR on a victim in need of medical help. In fact under the Civil Practice and Remedies Code, Chapter 74 Good Samaritan Law, SECTION 2, Section 74.001 (a) A person who in good faith administers emergency care, including using an Automated External Defibrillator, at the scene of an emergency but not in a hospital or other health care facility or means of medical transport is not liable in civil damages for an act performed during emergency unless the act is willfully or wantonly negligent. (Public Access Defibrillation League, [on-line] www.padl.org)

This author believes the threat of litigation will always exist with anything police officers do because of their position and unusual contact with the public. When someone places the call for medical assistance (cardiac arrest) through 911, the police officer is usually the first to respond, and is first on the scene, and

they need to have an AED with them in their patrol unit. Having the right tools to complete the task at hand will go a long way to help ensure that litigation is not a factor.

The more people learn about Automated External Defibrillator and the success record behind the use of AEDs, the more people will demand their use by anyone responding to the cry for help. In a study of 375 cases of AED's being used during an emergency, it was discovered that human error played a small role. "Only in four cases was a possible technical error judged as the underlying cause and in all cases defibrillatory shock was delivered less than 1-minute later than might have been expected. This finding indicates a high safety rate with these devices" (Rodolfo Muzquiz, ALR Paper, 2001).

CONCLUSIONS

According to the American Heart Association and the Center for Disease Control the following statistics are indisputable:

1. About 220,000 people a year die of coronary heart disease without being hospitalized.
2. Most of these are sudden death by cardiac arrest.
3. Brain death and permanent death starts to occur in just four minutes after someone experiences cardiac arrest.
4. Cardiac arrest can be reversed in most victims if it is treated within a few minutes with an electric shock to the heart to restore normal heart beat.
5. A victim's chances of survival are reduced by 7 - 10 percent with every minute that passes.
6. Few attempts at resuscitation succeed after 10 minutes.

7. In cities where defibrillation is provided within 5 - 7 minutes, the survival rate from cardiac arrest is as high as 49%.
8. If every community could achieve a 20% cardiac arrest survival rate, an estimated 45,000 - 50,000 people could be saved each year from AED alone. (AHA, americanheart.org, 2001)

Automated External Defibrillators are getting to be very common and can be found in many public buildings and places where large groups of people are found. They are no longer just used by medical personnel. During the research of AEDs, it was found to have both positive and negative articles written. Hopefully, through this research paper, this author will be able to convince the superiors and City Council of Lacy Lakeview of the importance of AED's being placed in the patrol units and used by our patrol officers.

Because rapid defibrillation is a proven therapy for adult victims of sudden cardiac arrest, and because of these technological advances, the American Heart Association (2003) states: "All basic life support personnel must be trained to operate, be equipped with, and be permitted to operate a defibrillator if in their professional activities they are expected to respond to persons in cardiac arrest. This includes all first responding emergency personnel, both hospital and non-hospital (e.g., emergency medical technicians, non EMT first responders, firefighters, volunteer emergency personnel, physicians, nurses and paramedics). To further facilitate early defibrillation, it is essential that a defibrillator be immediately available to emergency personnel responding to a cardiac arrest. Therefore, all emergency ambulances and other emergency vehicles that respond to or transport cardiac patients should be equipped with a defibrillator."

The American Heart Association also went on to state: "Rapid defibrillation and early cardiopulmonary resuscitation (CPR) are the two major contributors to the survival of adult victims of sudden cardiac arrest...Automated External Defibrillation is one of the most promising methods of treating cardiac arrest." Inclosing of this article by the American Heart Association they stated: "Public access defibrillation, which places Automated External Defibrillators in the hands of trained laypersons, has the potential to be the single greatest advance in the treatment of VF (ventricular fibrillation) cardiac arrest since the development of C.P.R.

In all the research conducted, the Automated External Defibrillator was found to be such a powerful tool to have with you when responding to a victim that is suffering from cardiac arrest. It has been documented that AEDs do really save lives of thousands of people each year that otherwise may not have survived. Police departments everywhere should be strongly encouraged to be trained and carry AED's with them while on patrol and responding to medical emergencies. Police officers, must take the necessary steps to increase the chain of survival when it comes to responding to cardiac arrest calls.

Should patrol officers be furnished with Automated External Defibrillators? This research paper was conducted in hopes of answering this question. There is a limited amount of research on AEDs and their use by police officers. Most believe that time is the most important factor in the chain of survival. With officers being the first on the scene more than 50% of the time, it makes sense for them to be equipped with an AED and encouraged to use them. It has been shown there are several laws in place that protect a person who carries and uses an

AED in an emergency situation as long as they receive the proper training and uses good judgment.

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