

COUNCIL OF SCIENTIFIC AND HEALTH ADVISORS

IOWA DEPARTMENT OF PUBLIC HEALTH

SUBCOMMITTEE REPORTS: Public Access Defibrillators

I. Summary of problem –

- A. Introduced by:
- B. At what meeting:
- C. Background: Approximately 350,000 Americans die each year from sudden cardiac arrest (SCA). Ventricular Fibrillation (VF) and Ventricular Tachycardia (VT) are the most common causes of SCA. The effective and recommended treatment is defibrillation¹. Defibrillation uses electrical shocks to initiate the heart's own "pacemaker" called the ventricular node. Untreated, cardiac arrest can result in death within 5-10 minutes while emergency crews may take twice as long to arrive.² One attempt to decrease the number of SCA victims is to increase the availability of automated external defibrillators (AEDs).³ AEDs are portable devices used for defibrillation. However, there are still questions about AEDs concerning issues such as potential safety hazards, training, liability, and placement. The purpose of this report is to describe and evaluate those issues surrounding public use of automated external defibrillators as identified in the published literature. No primary data were collected.
- D. Identify timeline: N/A

II. Available Evidence -

Automatic External Defibrillators are now available in laptop-sized cases. The cost is similar as well, ranging from \$2,500 to \$4,000 each. They weigh approximately 5-10 pounds and are typically brightly colored. The machines usually have only 2 or 3 buttons to minimize confusion. A typical AED has a power button and a shock button. Two electrode pads (usually attached, although some require the user to plug them in) have diagrams on the back to demonstrate where they should be placed. After initiating the AED, it will check for a shockable heart rhythm (VT or VF) and, if necessary, prompt the user to initiate the shock. The user is responsible for clearing the immediate area around the victim and pressing the shock button on the AED.

Most AEDs are self-testing and include reporting features on everything from heart rhythm data to audio recordings at the scene (much like an airplane's "black box").

Automatic External Defibrillators are considered highly effective and are recommended by the AHA as part of the "Chain of Survival."¹ Most AEDs are FDA approved and are considered prescription devices. As such, a prescription from a licensed practitioner is required to obtain the device.⁴ Iowa law requires a medical officer to oversee the purchase, use, training, and maintenance of AEDs.⁵

Although Sudden Cardiac Arrest in children is rare, it can happen.⁶⁻⁷ One potential hazard of AEDs is the use of countershock on children. Although the technology will detect a shockable arrhythmia in adults with over 90% effectiveness⁸, we found no empirical evidence to support the effectiveness

of AEDs on children. Currently, AEDs have not addressed the energy levels required to treat VT or VF in children.⁹ The recommended shock for a child is approximately 2-4 joules (J) per kilogram.¹⁰ The current energy levels of AEDs have an output of 150-360 J. One report did suggest that a child weighing 20 kg could be safely shocked with 200 J and actually recommends the use of AEDs on children¹¹. However, the AHA recommends only using AEDs on victims who are more than 12 years old and weigh more than 90 pounds.

Other hazards appear to be negligible and training related. The AEDs use visual and audible prompts to assist the user through the process of detecting the heart rhythm. AEDs have adhesive pads that are placed in a modified lead II position (upper-right sternal border and lower-left ribs over the heart). Both pads have a diagram on the back to show proper positioning (some models require specific positioning of each pad, whereas others have interchangeable pads). Upon detection of a shockable rhythm, the user makes the final decision to shock the victim when everyone is clear from contact. There is a hazard of electrical shock if the victim is not properly isolated, however, that is a training issue irrelevant to the proper functioning of the machine. It would appear that anyone who can successfully read a pictogram to place the electrodes, clear the area around the victim, and push the shock button on the machine can effectively operate an AED. The AHA even reported success training sixth-graders how to use AEDs.¹²

According to Iowa law, training to be certified is mandatory in order to operate an AED¹³. Re-certification must occur on a quarterly basis. This seems inconsistent with the American Heart Association, National Safety Council, and the American Red Cross. These organizations indicate that AED training can be effectively coupled with standard cardiopulmonary resuscitation (CPR) training by offering the courses together.

The issue of liability is certainly important to any organization or individual considering the use of an AED. Currently, Iowa's Good Samaritan Laws include the use of AEDs by properly trained and certified individuals. Most states have similar laws, while a few do include lay people who are not trained on AEDs but respond appropriately with a public access defibrillator. Some legislation even includes appropriation of funding for AED acquisition, training, etc..¹⁴⁻¹⁵ A general manager of Heartstream, an AED-producing affiliate of Hewlett-Packard Corp., reportedly stated that they will indemnify a user from financial liability to a victim's family provided the user has properly utilized the machine.¹⁶

Several studies have been conducted on the use of AEDs in the hospital environment. This appears to be an effective placement option.¹⁷⁻¹⁸ Another well-documented test use is in emergency response vehicles ranging from fire trucks to police cars.¹⁹⁻²⁰ Corporations are also installing AEDs for employee usage.²¹

III. Research Sources

- A. Literature review – see references noted below.
- B. Expert sources and testimony -
- C. Other people/organizations looking at issue - Other national organizations concerned about this issue include the American Heart Association, the National Safety Council, the American Red Cross, and the Public Access Defibrillation League (PADL).

D. What other states are doing – The Health Technology Advisory Committee (HTAC) of Minnesota reported on the issue in March of 1999. Their findings were similar to ours. They recommended “that widespread public deployment of AED should not proceed until ambulances, police units, highway patrol units, fire rescue units, ambulatory centers that see high risk patients, and hospitals are equipped with AED, and their effectiveness in these settings is established.”²² See Appendix I for current legislation. Florida was the first state to enact such a broad public access law in April 1997 (Chapter 34 of 1997). As of July 2000, forty-nine states, had enacted defibrillator laws or adopted regulations. In 2000 AED bills became law for the first time in Kentucky, North Carolina, South Dakota, Utah, Vermont, Virginia and Wisconsin.

E. Other: Federal legislation – on April 24, 1998 President Clinton signed Public Law 105-170 sponsored by Rep. Duncan, relating to defibrillators on airplanes. It declares that air carriers and individuals "shall not be liable for damages" in attempting to obtain or provide assistance. It directs the FAA Administrator to "evaluate regulations" and decide on future required use of AEDs on passenger aircraft and in airports. In Congress, Rep. Cliff Stearns (R-FL) and 132 cosponsors introduced the "Cardiac Arrest Survival Act of 1999", H.R.2498, regarding the placement of AEDs in federal buildings and providing civil immunity for authorized users. The Senate version is S.1488. The House bill was passed by 415y-2n on May 24, 2000.

III. Conclusions/Recommendations -

This committee supports the widespread use of public access defibrillators with the appropriate training, implementation, and outcome reporting. We also recognize that annual (rather than quarterly) skills practice on AEDs is prudent and sufficient, even combining other life support training with AED training is an acceptable practice for many national training organizations. This committee does not recommend the use of AEDs on children under 12 years old and weighing at least 90 pounds without further development and testing.

IV. Appendix I: Summary of Current Legislation on AEDs *(as reported by National Council on State Legislatures)*²³

Chart codes:

A = allow lay persons to use AED

L = provide limited immunity for trained lay persons under state Good Samaritan law.

\$ = provides funding & distribution

| State | Law /Year/Sponsor | Codes | Comments |
|-------|--|-------------|--|
| AK | H 395 of 1998 Rep. Bunde | A / L | (Signed 5/14/98) |
| AL | S 5 + S 351 SB 373 (1998) | A / L \$ | (Enacted 6/9/99) Appropriation: \$3 million for purchase of AED |
| AR | Act 101 of '99 HB 1006 (1999) Rep. Laverty | A / L | Signed by Governor 2/18/99 |
| AZ | H 2475 (enacted 5/12/99) | A / L | Signed by Governor 5/12/99 as Chapter 217 of 1999 |

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|----|--|----------------|--|
| CA | Statute: Health & Safety Code 1797.190 SB 911 of 1999 | A L | "Only those individuals who meet the training and competency standards established by the authority shall be approved for, and issued a prescription authorizing them to use AED." SB 911 - added exemption from liability. |
| CO | HB 1283 of 1999 by Rep. Spence | A / L | "Expected AED users receive training... through a course approved by the department of public health and environment" (signed 4/16/99) |
| CT | S 318 of 1998 Rep. Flaherty H 5650 of 2000 | A / L A | User must be trained (signed 5/19/98) H 5650 allows paramedics to use AEDs (signed 5/3/2000) |
| DE | H.332 of 1999 Rep. Ennis H.430 of 2000 | A | Requires the Office of Emergency Medical Services to coordinate a statewide effort to promote and implement widespread use of semi-automatic external defibrillators (SAEDs) and to maintain a minimum number of individuals trained to use SAEDs. [see note #3] |
| FL | H. 411 of 1997 | A / L | Use by any person who has had appropriate training; must complete basic AED course; must activate emergency medical services system upon use. (Signed 4/97 as Ch 34 of 1997) |
| GA | S. 566 Sen. Hill | A / L | Use by "any appropriately trained person"; owners must be subject to direct supervision of a physician. (Signed 4/6/98) |
| HI | H.2598 of 1998 Rep. Kawakami | A / L | User who completes training by physician is immune from civil liability. (Signed 7/14/98) |
| IA | Reg.: Public Health 641-132.1(147A) | A / L | (Public Health administrative regulation) |
| ID | S 1185 of 1999 Sen. Jack Riggs | A / L | Chapter 351 of 1999; effective 3/25/99 |
| IL | Public Act 90-746 HB 1217 (1998) Public Act 91-524 SB 458 (1999). | A / L | - SB 458 expands AED - Signed 8/13/1999 |
| IN | S. 171 (1998) Sen. Adams | A / L | (IC 16-31-6.5) Owners shall ensure that "expected users" complete a training course. |
| KS | SB 535 (signed 5/98) Senator Steineger | A / L | (K.S.A. 1997 Supp. 65-6144, §19) AED "may be used by any person who has ...obtained training and demonstrated proficiency in use..." |
| KY | HB49 (signed 2/2000) Rep. J. Coleman | A / L | |
| LA | S 100 (signed 7/2/99) Senator Hines | A / L | (R.S. 40:1236.11) |
| MA | S 2164 (chapter 137) (signed 5/28/98) Sen. Morrissey Chapter 142 of 1999 | A / L L | Any person trained in AED or basic cardiac life support is immune from civil liability 1999 law adds definition of AED Provider |
| MD | S. 294 (enacted 4/27/99) Rep. Hollinger | A / L | Adds MD Education Code §13-517 - Requires facilities to have a certificate before making AEDs available; users should have training and authorization before use; requires reports and records. |
| MI | H.4420 (signed 11/15/99) Rep. Gerald Law | A / L | Extends MI §691.1504, the Good Samaritan law on CPR, to include immunity for AED use. Effective date 11/16/99. |

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| MN | S.2861 (1998, Chapter 329) S 3345 of 1998 | A / L \$ | Non-professional user is exempt from civil liability. Appropriates \$450,000 for distribution to law enforcement. |
| MS | H 954 (signed 3/30/99) | A / L | Appropriate training "required"; A Mississippi licensed physician must exercise medical control authority. |
| MO | HB 1668 (signed 6/18/98) Rep. Hosmer | A / L | Use by emergency personnel or any person who has completed a course certified by the American Red Cross or American Heart Association that includes CPR. |
| MT | H 126 of 1999 (enacted 4/19/99) | A / L | |
| NE | L 498 of 1999 (enacted 3/30/99) Senator Wickersham | A / L | |
| NH | S. 67 (signed 7/16/99) | A / L | |
| NJ | Chapter 34 of 1999, was A 2321(signed 3/8/99) | A | A person shall not use a defibrillator unless trained. |
| NM | H. 375 (enacted 4/1/99) | A / L | |
| NV | AB 147; Ch. 474 of 1997 AB 409 of 1999 (enacted 5/20/99) | A / L | (§7 of AB 409) Use by "any person who has successfully completed the training requirements" Encourages employers to hire a person trained in CPR and AED use. |
| NY | S 5477 of 1998 [Public Health, Art 30, sec 3000-a;-b] Sen. Goodman | A / L | Only a person who has completed training in CPR & AED operation may use. Authorizes possession & use after obtaining written agreement w/ emergency health care provider. (signed 8/5/98) |
| NC | S1269 (signed 7/14/2000) Sen. Warren | A / L | Provides immunity for AED users, as well as trainers, owners and physicians who write prescription for AED purchase. (effective date 10/1/2000) |
| ND | H 1242 (enacted 3/25/99) | A / L | Requires notification of Dept. of Health of location of AEDs. |
| OH | HB_717 of 1998 (signed 12/17/98) | A / L | Effective 12/98 |
| OK | HB 1190 of 1999 (enacted 4/26/99) by Rep. Stanley | A / L | |
| OR | S. 313 (signed 6/4/99) | A / L | States use of AED is "medical care" |
| PA | H.1897 of 1998 (signed 12/15/98) | A / L | §11 of bill provides AED civil immunity |
| RI | S.2239 of 1998 S.920 of 1999 (signed 6/29/99) RI §23-6.2-2 Sen. Polisena Sen. Kelly | \$ | S.239 mandates distribution of AED devices to every city, town and public college in R.I. S.920 funds 35 AEDs to State Police. |
| SC | S. 728 of 1999 Enacted 6/1/99 | A / L | |
| SD | S.83 of 2000 (Signed by the Governor, 2/25/2000) Sen. Hainje | A / L | Requires a physician to authorize in writing placement, training and maintenance; users also must activate emergency services. |
| TN | H.2970; Ch. 963 of 1998 (signed 5/11/98) Rep. Halteman-Harwel H.1218 of 1999 | A / L | Expected users shall complete AED course; maintain & test device; users also must activate emergency services. |
| TX | H.580 of 1999 (enacted 6/19/99) Rep. Kyle Janek | A / L | |

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| UT | H.B. 98 (1998) Rep. J. Valentine H.B. 50 of 1999 Rep. R. Siddoway S.B. 86 of 2000 Sen. J. Valentine | A L L | Allows use by trained persons w/o a license. H.B. 50, now Chapter 285 of 1999, expands Good Samaritan liability exemption S.B. 86, liability exemption extended to laypersons (signed as Chapter 62 of 2000, effective date 5/1/2000) |
| VA | HB2097 of 1999 HB1049 of 2000 | A / L L | HB 1049 clarifies and expands immunity (signed by Governor, 4/9/2000 as Chapter 928, effective date: 7/1/2000) |
| VT | S 283 of 2000 Senator Illuzzi | A / L | Prohibits any person from operating an AED unless the person has successfully completed a training course in the operation of the AED. Users providing emergency care will not be liable for civil damages. (signed 5/17/2000, effective 7/1/2000) |
| WA | H2998 of 1998 Rep. Sheahan | A / L | Owners shall ensure "expected users" complete a training course. |
| WI | AB 239 of 1999 AB 521 of 2000 Senator Johnsrud | A / L | AB 239 (signed 7/28/99) AB 521 - redefines first responders and clarifies required training (signed 4/13/2000; effective date 11/2000) |
| WV | H.2269 (enacted 4/1/99) | A | |
| WY | H. 178 (3/3/99) Rep. Diercks | A / L | Any person acquiring an AED required to ensure that "expected defibrillator users" receive training" |

IV. Appendix II: Relevant Websites

1. www.americanheart.org
2. www.nsc.org
3. www.redcross.org
4. www.padl.org/html/index.html
5. www.medicalconsulting.net/docs/padlaws.html
6. www.survivalink.com
7. www.physiocontrol.com
8. www.healthcare.agilent.com/cardiology/product_information/heartstream/

V. Identify a communications strategy -

- A. Report to requester
- B. Press conference with subcommittee members

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- ⁴ Code of Federal Regulations. Title 21;Volume 8,part 801.109
- ⁵ State of Iowa Department of Health Bureau of Emergency Medical Services. AED Education for Public Access Defibrillation in Iowa. January 2000;1-4

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