

## Commentary

# Charging up the public for automated external defibrillators

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## Abstract

Public training in the use of automated external defibrillators to treat out-of-hospital cardiac arrests has been receiving increased attention. The implementation of public access defibrillation programs has been the most significant intervention to improve survival in decades. Dramatic success came when we placed automated external defibrillators in the hands of the public to be utilized without an Emergency Medical Services response having to occur. The device is simple to operate – sixth-grade children have demonstrated safe and effective operation. Training should be taken to its elemental level. Cardiopulmonary resuscitation training should not be forgotten; it too should be taken to its simplest form.

Public training in the use of automated external defibrillators (AEDs) to treat out-of-hospital cardiac arrests has been receiving increased attention [1]. The incidence of cardiac arrests and ventricular fibrillation as its cause has been well reported [2]. Overall survival from out-of-hospital cardiac arrest has remained low, at less than 5% in most systems [3]. Emergency Medical Services (EMS) has been chasing this dragon since the days of Seattle's Medic I in the 1960s. From the early Emergency Medical Technician – Ambulance interventions with cardiopulmonary resuscitation to the sophisticated deployment of full resuscitation by paramedics, the dragon continues to elude us. The dragon we chase is time.

In an ideal setting, a victim of cardiac arrest would be recognized and the telephone call to 911 made within 1 min. Call handling and dispatch would occur within 2 min. The response time by the EMS would be 3 min. Access to the victim, defibrillator application and the first shock would be delivered within 1 min. This adds up to 7 min. The opportunity for survival decreases by 10% for every minute that passes [4]. This ideal victim has at best a 30% chance of survival. We know that the ideal rarely occurs and our 5% survival reflects the dragon breathing down our necks as every minute ticks by.

The implementation of public access defibrillation programs has been the most significant intervention to improve survival in decades [5–7]. Initially deployed with trained targeted responders, these devices improved survival. The dramatic success came when we put the AEDs in the hands of the public to be immediately utilized without a response from anyone having to occur. The devices then truly became 'public accessible'. The Chicago airport-based program was one of the first to deploy AEDs throughout their entire facility in this fashion. The devices were hung openly on the walls so they were immediately available to anyone. This public access defibrillation program demonstrated a 68% overall survival and a 75% survival from ventricular fibrillation [5]. The dragon clearly delineated itself, survivors received their first shock in less than 5 min.

Over one-half of the rescuers were travelers and had not been trained to use the AED. The simplicity of the operation of the device makes it foolproof. Voice and visual prompts take the rescuer step by step through the procedure. Studies have also demonstrated that even sixth-grade children can operate an AED safely and effectively [8]. Training for these devices can and should reflect their lack of complexity. The recent change by the Food and Drug Administration to make the Philips HeartStart™ AED an over-the-counter product further demonstrates the safety and simplicity of operation of these devices.

This is by far the most aggressive intervention we have charged the layperson to perform. It can be expected that they will have concerns and even fears in taking on this challenge. The more these devices become commonplace, the more familiar the public will become through this passive learning process. Exposure through commercials as medications are currently introduced, and their presence in social places and workplaces will all increase the public awareness. The more we are familiar with AEDs, the more

that they are available, the greater the likelihood that they will be used and used in a time frame that will have impact. Training should be taken to its elemental level, and now studies support that training can be greatly simplified and still successful [1]. This will improve learning success and retention. Simplified training programs can be readily integrated into the school curriculum and job orientation, and can be more reliably sustained.

Cardiopulmonary resuscitation training should not be forgotten. It too should be taken to its simplest form to enable the layperson to be successful in remembering and completing the tasks. Its usefulness has been the subject of recent debates. In the same light, changes in sequence may very well be the key as we continue to study the procedure in the out-of-hospital arrest environment. It has, however, been shown to improve survival when used prior to defibrillation if response times were greater than 4 min [9].

It is important to maintain the link of these programs to EMS systems, especially 911. Public sites identified as having an AED can be activated when a caller is stressed by the circumstances or does not know that an AED is present. The caller that has not been trained to use an AED can be easily coached on the telephone through each step to support the AED prompts. A layperson who might not otherwise act can be encouraged to respond and be given the confidence they need to act.

Finally, we must not forget that the majority of cardiac arrests does not occur in public places. In one study only 16.1% of cardiac arrests occurred in public settings [10]. The question of where AEDs should be placed is incompletely answered. Should they be considered a utility like water or considered a device that should be positioned based on potential impact? The conquering of the dragon will once again rely on the response of EMS and more than defibrillation alone.

## Competing interests

The author(s) declare that they have no competing interests.

## References

1. Beckers S, Fries M, Bickenbach J, Derwall M, Kuhlen R, Rossaint R: **Minimal instructions improve the performance of laypersons in the use of semiautomatic and automatic external defibrillators.** *Crit Care* 2005, **9**:R110-R116.
2. **International Consensus on Science Guidelines 2000 for cardiopulmonary resuscitation and emergency care.** *Circulation* 2000, **102**(suppl I):I-1-384.
3. Becker LB, Ostrander MP, Barrett J, Kondos GT: **CPR Chicago. Outcome of cardiopulmonary resuscitation in a large metropolitan area – where are the survivors?** *Ann Emerg Med* 1991, **20**:355-361.
4. Advanced Life Support Working Party of the ERC: **Guidelines for adult advanced cardiac life support.** *Resuscitation* 1992, **24**: 111-121.
5. Caffrey S, Willoughby PJ, Pepe P, Becker L: **Public use of automated external defibrillators.** *N Engl J Med* 2002, **347**:1242-1247.
6. Page RL, Joglar JA, Kowal RC, Zagrodzky JD, Nelson LL, Ramaswamy K, Barbera SJ, Hamdan MH, McKenas DK: **Use of automated external defibrillators by a U.S. airline.** *N Engl J Med* 2000, **343**:1210-1216.
7. Ornato JP, Weisfeldt M, Travers A, Christenson J, McBurnie MA, Zalenski R, Becker LB, Schron EB, Proschan M: **Public Access Defibrillation Trial Investigators. Public-access defibrillation and survival after out-of-hospital cardiac arrest.** *N Engl J Med* 2004, **351**:637-646.
8. Grundy JW, Comess KA, DeRook FA, Jorgenson D, Bardy GH: **Comparison of naïve sixth-grade children with trained professionals in the use of an automated external defibrillator.** *Circulation* 1999, **100**:1703-1707.
9. Cobb LA, Fahrenbruch CE, Walsh TR, Copass MK, Olsufka M, Breskin M, Hallstrom AP: **Influence of cardiopulmonary resuscitation prior to defibrillation in patients with out-of-hospital ventricular fibrillation.** *JAMA* 1999, **281**:1182-1188.
10. De Maio VJ, Stiell IG, Wells GA, Martin MT, Doherty J, Spaite DW, Maloney JP, Nichol G, Cousineau D, Brisson D, Campeau T, Dagnone E, and the OPALS Study Group: **Potential Impact of Public Access Defibrillation Based upon Cardiac Arrest Locations.** *Acad Emerg Med* 2001, **8**:415-416.