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Community public access sites: Compliance with American Heart Association recommendations☆

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ABSTRACT

Background: Public access defibrillation (PAD) programs are a major goal of the American Heart Association (AHA) to ensure that automated external defibrillators and trained lay rescuers are available in public areas where sudden cardiac arrest (SCA) is likely to occur. The Johnson County Early Defibrillation Task Force (JCEDTF) is a volunteer organization which distributed AEDs throughout Johnson County, Iowa. JCEDTF was responsible for initial training but ongoing support was the responsibility of each site.
Objective: The purpose of this study was to evaluate compliance of community PAD sites to recommendations for site maintenance as proposed by the American Heart Association (AHA).
Methods: Thirty-two surveys were distributed to community PAD sites that received assistance from JCEDTF. PAD sites were categorized into business, educational, or community sites. A twenty-five point scoring system to assess PDA programs was developed based on AHA recommendations. On-site evaluations were conducted to verify survey results and assess barriers to an effective PAD site. Differences among the three categories were measured with ANOVA.
Results: No site was able to comply with all the AHA guidelines for a PAD site. The mean score among all sites was 57% of possible points with no significant differences among the three categories. Business sites were more compliant with ongoing training compared to educational and community sites ($p < 0.022$).
Conclusions: Community PAD sites in Johnson County currently do not comply with the recommendations for effective PAD sites. After initial training and establishment of community PAD sites, better methods for assuring ongoing training and maintenance are needed for sites to be effective.

1. Introduction

Sudden cardiac arrest (SCA) is a major cause of death in United States.[1] Ventricular fibrillation is a common rhythm abnormality detected in SCA which is effectively treated only if delivery of an electric shock to chest occurs quickly. For every minute delay in defibrillation, survival rates fall 7–10%.[2]

Automated external defibrillators (AEDs) are designed to distinguish between shockable and non-shockable cardiac arrest rhythms and to deliver a shock, if indicated. In 1994, the American Heart Association (AHA) began recommending lay rescuer AED programs to improve survival rates of out-of-hospital SCA in adults. Public access defibrillation (PAD) programs became a major goal of AHA.[3] The goal of PAD programs is to shorten the time from onset of ventricular fibrillation until CPR and shock delivery by ensuring that AEDs and trained lay rescuers are available in public areas where SCA is likely to occur. The AHA has published recommendations for the elements of an effective PAD site. These include: a planned and practiced response; ongoing training of anticipated rescuers in CPR and use of AEDs; links with local EMS agencies and a process of ongoing quality improvement.[4,5]

The Johnson County Early Defibrillation Task Force (JCEDTF) is a volunteer, non-profit organization incorporated in 2002 with the primary goal of reducing death and disability resulting from SCA through use of AEDs. The JCEDTF Board of Directors includes paramedics, nurses, and physicians from the local EMS agencies and hospitals, law enforcement officers, and representatives from the American Red Cross and the AHA. The goals of JCEDTF are to develop awareness in Johnson County about the importance of early public access defibrillation; serve as a resource to individuals and organizations who wish to establish public access defibrillation programs and develop a strategic plan to prioritize locations

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in Johnson County where the need is greatest to place AEDs. The task force is supported by donations and grants. All AEDs were purchased with grant funds. JCEDTF equipped or assisted with the purchase of AEDs within first responder units and AEDs in community PAD sites.

Johnson County has a population of 120,000 persons in a geographical area of 623 square miles. One-half of the population is in Iowa City, which is 10% of the land area. Coralville is a small contiguous town, and the remaining population is rural. First responder units within separate fire and law enforcement units are dispatched to all medical calls within the county. Johnson County Ambulance Service is the sole 911 provider for the county and responds to 50–60 cardiac arrests annually. Although the average response time within Iowa City limits is 5–6 min, the average county-wide response time is 15 min. Thus, effective PAD sites may significantly improve survival.

The purpose of this study was to evaluate adherence of the community PAD sites to the AHA guidelines for PAD sites after program initiation. We hypothesized that the components of an effective PAD program were present in sites that received or purchased AEDs in Johnson County and that programs were maintained over time.

2. Methods

2.1. Participants and survey distribution

In 2002, JCEDTF established a priority list to determine appropriate PAD locations which was based on prior arrest locations. Those sites were contacted directly, and if interested, were provided funds for AEDs and initial training. Additional sites independently requested assistance with AED purchase and these requests were accommodated. Sites for this study received assistance from the JCEDTF between 2002 and 2004. JCEDTF provided or assisted with initial CPR training and AED operation at all sites. Information on AED maintenance and recommendations for repeat training every 2 years was provided at program initiation, but no additional support was available from JCEDTF.

A seven-page survey was mailed to each PAD site contact person in 2006. Surveys collected demographic information about each site and questions of the point scoring system (see below) and budgeted costs to maintain the PAD site. Surveys included specific answer choices for each question in order to standardize the answers. After return of each survey, an attempt was made to perform an on-site evaluation. All site evaluations were conducted by one author (MP). Site evaluations confirmed survey responses, viewed location of AEDs, and assessed any barriers to finding or using AEDs.

PAD sites were separated into three groups consisting of education, business, and community sites. Educational sites included public schools and one community college. Community sites included churches, shopping malls, libraries, and public recreational centers. Business sites ranged from small, locally owned businesses to major corporations. Number of employees at businesses ranged from less than 50 to more than 500.

This study was approved by the University of Iowa Institutional Review Board.

2.2. Point scoring system

A twenty-five point scoring system was developed by the investigators and derived from the AHA four major components of an effective PAD site.[5] Multiple elements with each component were defined and assigned numeric values (Table 1). The point value for each element was assigned empirically by the investigators, weighting elements related to delivery of CPR and use of the AED higher (training and program maintenance) than systems issues

Table 1
Twenty-five point scoring system for survey.

Planned and practiced response

How many employees are trained in CPR?
- 2-point: 100% of the employees are trained.
- 1-point: 50% of employees are trained.
- 0.5-point: 25% of the employees are trained.
- 0.25-point: 10% of employees are trained.
- 0-point: less than 10% of the employees are trained.

How many employees are trained in the use of AED?
- 2-point: 100% of the employees are trained.
- 1-point: 50% of employees are trained.
- 0.5-point: 25% of the employees are trained.
- 0.25-point: 10% of employees are trained.
- 0-point: less than 10% of the employees are trained.

How many employees are trained in both CPR and the use of an AED?
- 2-point: 100% of the employees are trained.
- 1-point: 50% of employees are trained.
- 0.5-point: 25% of the employees are trained.
- 0.25-point: 10% of employees are trained.
- 0-point: less than 10% of the employees are trained.

What efforts have been undertaken to confirm that employees know of the existence and location of the AED?
- 1-point: employees received an in-service on the existence and location of the AED(s) upon initial hire, or some other means of information communicating to the employee that the site has an AED and its location.
- 0-point: no efforts have been made to confirm that employees know of the existence and location of the AED.

What steps have been taken to minimize the likelihood of tampering/vandalism/theft of the AED?
- 1-point: defibrillator is placed in a controlled location, in a protective wall mounting, or some other mechanism is in place to prevent/alert when the device is being tampered with or removed from its case.
- 0-point: defibrillator is not placed in a controlled location, and is not in a protective wall mounting.

Do you have a written policy established on the use of the AED?
- 1-point: yes, there is a written policy established.
- 0-point: no written policy established.

What type of ongoing maintenance program do you have?
- 2-point: daily AED check.
- 1.75-point: weekly AED check.
- 1.5-point: monthly AED check.
- 1.25-point: quarterly AED check.
- 1.0-point: yearly AED check.
- 0-point: no maintenance check.

Do you document the maintenance?
- 1-point: yes, maintenance is documented.
- 0-point: no maintenance documentation occurs.

Is the location of an AED placed so that it can be reached with ninety seconds from all areas of the program site?
- 1-point: yes.
- 0-point: no.

Are the AEDs in locations that are accessible during all hours that your facility is in operation?
- 1-point: yes
- 0-point: no

Training of anticipated rescuers in CPR and use of the AED

Is a trained rescuer present at all times?
- 2-point: trained rescuer is present 100% of business hours of operation.
- 1.5-point: trained rescuer is present 50% of business hours of operation
- 1.0-point: trained rescuer is present 25% of business hours of operation.
- 0-point: there is never a trained rescuer present during hour of operation.

Does your facility require or provide ongoing training in the use of the AED?
- 1.0-point: facility requires and provides ongoing AED training.
- 0.5-point: facility requires ongoing AED training, but does not provide this training.
- 0-point: facility neither requires nor provides ongoing AED training.

Are certain people expected or required to attend CPR and AED training?