Public Access Defibrillation: How Widespread Is It and What Are the Short-Term and Long-Term Results?

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Public access to defibrillation means making automated external defibrillators available in public and/or private places where large numbers of people gather or people who are at high risk of heart attacks live. The automated external defibrillator is a computerised medical device that can check a person’s heart rhythm. It can recognise a potentially lethal rhythm that requires a shock and it can advise the rescuer when a shock is needed. The automatic external defibrillator uses voice prompts, lights, and text messages to tell the rescuer the steps to take. The concept of public access defibrillation is based on deductive reasoning. Early defibrillation improves outcome from cardiac arrest due to ventricular defibrillation (VF) [1–4]. The increased availability of automatic external defibrillators should result in earlier defibrillation, leading to better outcome from cardiac arrest. This concept has not been still proved prospectively.

Public access defibrillation dates from 1986, when the first defibrillator for public use became available. However, the concept failed to gain support for several reasons, particularly the lack of acceptance by physicians. Such devices were available through prescription, but few were prescribed despite family acceptance being reasonable, particularly in high-risk families. Cost and reimbursement also slowed acceptance. Current enthusiasm for public access defibrillation has been spurred by recent breakthroughs in automatic external defibrillator technology. Portable defibrillators can be deployed in two ways in the community: (1) in the vehicles of emergency personnel, such as police officers, who are otherwise not equipped with advanced life-support equipment or a defibrillator; or (2) in fixed locations, such as casinos, Cardiology Department, Guglielmo da Saliceto Hospital, Piacenza, Italy
airports, health clubs, office buildings, shopping malls, or government offices. The ideal primary outcome would be 30-day survival with intact neurological function [5]. However, it may be impractical to use this as an outcome, because individual consent would be needed to examine patients and medical records. Because informed consent may be difficult to obtain after resuscitation from sudden cardiac arrest, information about functional outcomes will be missing for some patients. If this information is missing for a large number of patients or is preferentially missing for patients enrolled in one intervention arm or the other, then the results of the study may be biased. As an alternative, a primary outcome of 30-day survival could be supplemented by information about hospital discharge status.

**Results of Public Access Defibrillation**

An important report from Seattle, Washington, examined ‘public’ location in cardiac arrest [6]. These investigators again confirmed that most cardiac arrests occur in the home (76%); only 16% occur in public sites. The most common public location for cardiac arrest was Seattle Tacoma Airport, where seven cardiac arrests occurred each year. Penitentiaries were the second most common location. Shopping malls had an average of 0.7 arrests each year, and sporting arenas 0.4 each year during major events. Other, less frequent locations included hotels, government offices, schools, and churches.

The clinical situations in which the defibrillator has been shown to have the greatest efficacy to date are airports and casinos [7, 8]. These two settings are similar to each other in several ways. In both, large numbers of dedicated workers are present in a relatively small geographic area, and large numbers of people who could experience sudden cardiac arrest are in daily proximity to the defibrillator. In the studies conducted in these settings, 40% or more of individuals experiencing cardiac arrest survived; this is a far higher percentage than that typically achieved anywhere else outside of a hospital.

Results of defibrillator deployment and use in other situations may have less benefit. The Public Access Defibrillation (PAD) [9] trial was a multi-centre study in which community-based training was employed in ‘high-risk’ settings. The settings included facilities with more than 250 persons aged over 50 years on site for most of the day, or sites where a cardiac arrest had occurred within the past 2 years. A total of 1260 facilities were included. The community sites were mostly recreation, shopping, and entertainment facilities. Sites were randomised to have rescuers trained in CPR alone or rescuers trained in CPR and defibrillator use. Approximately 20 000 lay volunteers were trained, representing almost 10 volunteers per available defibrillator. The primary endpoint of the study was survival to hospital discharge. More