

USING THE AUTOMATED  
EXTERNAL DEFIBRILLATOR

# Resuscitation

by Susan Blonshine, BS, RRT, RPFT

**I**n the United States, there are 300,000 cardiac arrests annually. Cardiopulmonary resuscitation (CPR) will restore the return of spontaneous circulation and hemodynamic stability in approximately 40 percent to 60 percent of the cases. Cardiac arrest outcomes should improve with public education and the earlier initiation of basic life support (BLS) and advanced cardiac life support (ACLS). One of the primary objectives is early defibrillation. Defibrillation is known to be the single most important intervention in the management of ventricular fibrillation (VF) or pulseless ventricular tachycardia.

### Improving survival

Several studies are addressing prehospital factors that impact outcome. Researchers in On-

tario, Canada, have reported a three-phase study to identify modifiable factors associated with survival in prehospital cardiac arrest. The emergency medical service (EMS) provided BLS and ambulance defibrillation but did not include prehospital ACLS. Over a four-year interval, more than 5,000 patients were included in the study. The authors concluded that survival would be improved by optimizing the EMS response intervals, bystander CPR, and first-responder CPR by fire or police.<sup>1</sup>

The advent of the automated external defibrillator (AED) presents an additional opportunity to improve survival. AEDs are becoming the standard of care for prehospital care providers. The American Heart Association (AHA) supports the national effort to make AEDs

available to the public. The AHA recommends the use of AEDs for adults and children greater than eight years of age. The newest generation of AEDs are smaller, lighter, easier to use, and less costly.

Widespread training of the traditional first responders, such as police and firefighters, to use AEDs appears to be successful.<sup>2</sup> Another study supported these findings, but noted two problem areas: incorrect airway management and a delay in CPR in order to use the AED to reanalyze a nonshockable rhythm. This study may serve as an alert to trainers to emphasize the integration of proper airway and CPR skills.<sup>3</sup> The outcomes associated with training nontraditional responders may not be as positive, and further research is required in this area.<sup>2</sup>

**Helping first responders**

Policies and procedures for first responders such as police should be well established as related to dispatching. Response time is a critical element for patient survival. A study in Pittsburgh compared survival to hospital discharge in a group of adult patients suffering cardiac arrest before EMS arrival. The intent of the study was to assess the early intervention of the AED by police officers who generally arrive before the EMS.

When police arrived before EMS personnel, shock administered by the police as compared to that delivered by the EMS personnel resulted in improved survival, 26 percent versus 3 percent. The authors concluded that the police use of AEDs decreased the time to defibrillation and that AED use was an independent predictor of survival to hospital discharge.<sup>4</sup> Given these results, one might predict that there would be a benefit to public access and training in use of AEDs. A retrospective analysis of more than 5,000 cases in

Belgium estimated an increase of over 30 percent in the survival rate if lay responders were prepared to use an AED. However, the issues associated with

training and skill maintenance were not addressed.

The first responder providers may be faced with a patient with an implantable cardioverter defibrillator (ICD). Training should include the interaction of the two devices, ICDs and AEDs.

**RTs maintain critical role in CPR**

The prehospital issues become increasingly important as respiratory therapists work in multiple clinical settings and may have the opportunity to impact the prehospital factors. Additionally, AEDs are moving into the hospital setting as well. In a 1998 article in *NBRC Horizons*,  
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**references**

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2. Riegel, B. (1998). Training nontraditional responders to use automated external defibrillators. *American Journal of Critical Care*, 7(6), 402-410.
3. Davis, E.A., & Mosesso, V.N. Jr. (1998). Performance of police first responders in utilizing automated external defibrillation on victims of sudden cardiac arrest. *Prehospital Emergency Care*, 2(2), 101-107.

4. Mosesso, V.N. Jr., Davis, E.A., Auble, T.E., et al. (1998). Use of automated external defibrillators by police officers for treatment of out-of-hospital cardiac arrest. *Annals of Emergency Medicine*, 32(2), 200-207.

**additional reading**


Barnes, T.A. (1998, March/April). Respiratory therapists play vital role in CPR. *NBRC Horizons*, 24(2).



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Thomas Barnes, EdD, RRT, listed defibrillation of VF or ventricular tachycardia (VT) with manual, semiautomatic, or AEDs as one of the five critical tasks for respiratory therapists to assume when they are the best-trained responders at the scene.

Respiratory therapists maintain a critical role in CPR at the bedside, as instructors, and in the ongoing research for improved methods. Not only is maintenance of all related CPR skills (BLS, ACLS, AEDs) critical to the respiratory therapist, but also we must continue to establish ourselves as the leaders in performance and instruction. In addition, more research must lead the way to fully understand the mechanisms of cardiac arrest and to improve methods of increasing cardiac output and survival. 

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