

Study Shows Increased Survival for CPR Emergency Response Plans That Include AEDs

American Heart Association late-breaking clinical trial background report

ORLANDO, Nov. 11 – Results of a large trial of Public Access Defibrillation (PAD) were presented today at the late-breaking clinical trial session at the American Heart Association's Scientific Sessions 2003.

In a randomized controlled trial of PAD in a variety of public settings, researchers selected 993 community sites in 24 U.S. and Canadian cities. To be eligible, sites could not have immediate access to emergency medical services, but had to have an estimated response time less than 15 minutes.

The results also added to existing data about the ability of laypeople to safely use an automated external defibrillator (AED), a device that restores abnormal heart rhythm.

"At this point, a prescription is required to obtain an AED, but we believe the likelihood of harm is very minimal. These devices have been engineered so that it would be very difficult to shock someone who doesn't need to be shocked," said Joseph P. Ornato, M.D., professor and chairman of the department of emergency medicine at Virginia Commonwealth University/Medical College of Virginia in Richmond.

Each day in the United States, more than 1,200 people die suddenly from cardiac arrest before they can be admitted to a hospital. The study asked whether fewer people would die if apartments, malls, offices, stadiums, and senior centers had lightweight, easy-to-use defibrillators – and volunteers trained to use them.

The researchers presented data comparing the number of cardiac arrest victims who required resuscitation and survived to hospital admission at sites using AED with those using cardiopulmonary resuscitation alone.

The sites were randomized in the type of training and equipment they used. Volunteers at half the sites received rigorous, standard training to call 9-1-1 and perform CPR. Volunteers at the other sites received the same CPR training, and were trained to use automated external defibrillators (AEDs). At those sites, AEDs were transported so that volunteers could get the device to a person needing resuscitation within three minutes. More than 20,000 volunteers received training and more than 1,600 AEDs were put in place to conduct the trial.

The size of each site (not necessarily a single building) was defined by a projected 50 percent probability that at least one out-of-hospital cardiac arrest would occur during the 15-month study period. Projections were based on the number of people over age 50 on the site and the history of emergency medical service responses to the facility.

The majority of sudden cardiac deaths result from ventricular fibrillation, which is a too-rapid heart rhythm originating in the heart's lower chambers. The most important factor in surviving this condition is how quickly a defibrillator is used to shock the heart back into a normal rhythm. Most out-of-hospital sudden cardiac deaths happen at home, but 20-25 percent occur in public places where bystanders might be able to help until emergency medical services arrive. The current survival rate for ventricular fibrillation is less than 10 percent.

"We excluded areas that already had coverage by trained teams, such as industrial plants with a doctor and nurse who have a defibrillator, or areas in which professionals already have a duty to respond, such as law enforcement offices. Instead, we picked places that were randomly relying on citizens to do what they could to help. We went out of our way to involve a variety of venues, because it makes sense that certain types of locations are more likely to benefit," Ornato said.

Results of this study will only apply to sites in which EMS services can respond in less than 15 minutes, Ornato cautioned. The value of laypersons using an AED in more isolated settings, such as on ferry boats or rural centers, will not be answered. Likewise, results from this trial will not be generalizable to the home setting, where the majority of cardiac arrests occur. The National Institutes of Health has funded a separate

study, the HAT (Home AED Trial), to determine whether training someone in the home of a high-risk patient can reduce the incidence of sudden cardiac death.

The trial was sponsored by: the National, Heart, Lung, and Blood Institute; the American Heart Association; Medtronic/Physio-Control Corporation; Guidant Corporation; Cardiac Science/Survivalink, Incorporated; Philips Corporation/Heartstream Operation; and Laerdal Corporation. In addition, most sites obtained local donations of money and training time to complete the study.