

Automated External Defibrillators User-Friendly Even For Children

Science Daily (Oct. 22, 1999) — DALLAS, Oct. 19 -- Sixth-grade school children with moderate training can learn to use automated external defibrillators (AEDs) to save the lives of cardiac arrest victims almost as quickly and efficiently as professional emergency medical personnel, researchers report today in *Circulation: Journal of the American Heart Association*.

"Now we know that AEDs are literally easy enough for a child to use," says Gust H. Bardy, M.D., of the University of Washington Medical School, Seattle, and a researcher involved in the study. "The development of user-friendly defibrillators is a major advance in our efforts to improve the chances of surviving a sudden cardiac arrest. The broader use of these devices by the public could save as many as 50,000 lives each year."

Previous studies have shown that trained non-professionals had little difficulty using AEDs on real patients in sports stadiums, theatres and casinos. However, this was the first AED study involving children.

AEDs are used to restore a normal heartbeat in an individual who has experienced sudden cardiac arrest. Sudden cardiac arrest is usually caused by ventricular fibrillation -- a chaotic, abnormal electrical activity of the heart that causes the heart to quiver in an uncontrollable fashion. When this occurs, little or no blood is pumped from the heart. The person loses consciousness very quickly, and unless the condition is reversed, death follows in a matter of minutes. The AED provides an electrical shock to the heart, which helps to restore a normal rhythm. But for every minute of delay in delivering that shock, the chances of survival drop about 10 percent.

"There is a persistent idea that many hours of special training are required to operate an AED," says Bardy. "But the fact is, these machines are incredibly easy to use. After one minute of instruction, it took sixth graders less than 30 seconds longer than a trained professional to apply a shock that could restore a heartbeat."

Researchers recruited 15 sixth-grade pupils from a private school in Seattle who had received parental permission to participate in the study. The students were given brief instructions on how to remove the packaging from the electrode pads of the AED. They were also instructed on how and where to properly place the pads on the mannequin's chest so that the electrical shock to defibrillate the heart would be given safely and correctly.

The children were not allowed to ask questions during the test, and researchers provided no other guidance. Their performance times were compared to those of 22 trained emergency medical technicians and paramedics who also had no previous experience with this type of defibrillator, but were trained in defibrillation and cardiac arrest rehabilitation.

"It took the sixth-graders an average of 90 seconds to complete the defibrillation compared to 67 seconds on average for the EMTs/paramedics," says Bardy. He adds that all of the study participants correctly placed the electrode pads, and all remained clear of the 'patient' during shock delivery. After completing the test, 14 of the 15 sixth-graders said they felt confident that they could teach someone else how to correctly use the AED. All of the students said they believed they could use the AED on a family member should the need arise.

"We now have evidence that the operational design of the AED tested in this study is very user friendly. But in order to take advantage of the lifesaving potential of AEDs, we have to make them accessible to more and more laypeople," Bardy says.

The American Heart Association recommends that laypeople take an AED training course like the association's HeartSaver AED. The course, 3 1/2 to 4 hours long, is no longer than a regular CPR training course.

"Training is crucial. While this study proves that AEDs are extremely easy to use, it's important to remember that you can't just arrive on the scene of an emergency and hook someone up to the device. People who need an AED also need someone who knows CPR. And it's important to remember that not every emergency requires an AED. An AED does not help someone who is choking. You need training to learn how to assess the emergency and determine if it's CPR, an AED, the Heimlich Maneuver or something else the patient needs," says Bardy.

Bardy says the majority (95 percent) of those who suffer cardiac arrest outside of a hospital die. He blames that on lengthy response times resulting from limited access to emergency medical personnel who are equipped with AEDs or other defibrillators.

The American Heart Association states that expanded access to AEDs and increasing the number of people who are trained to use them can dramatically increase survival from cardiac arrest.

Co-authors are John W. Gundry, M.D.; Keith A. Comess, M.D.; Francis A. DeRook, M.D.; and Dawn Jorgenson, Ph.D.