

SOUTHWESTERN NEWS

Media Contact: Amy Shields

214-648-3404

amy.shields@utsouthwestern.edu

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UT SOUTHWESTERN RESEARCHERS FIND AUTOMATED EXTERNAL DEFIBRILLATORS ARE SAFE AND EFFECTIVE ABOARD AIRPLANES

DALLAS – Oct. 26, 2000 – Researchers at UT Southwestern Medical Center at Dallas have found that a device which can be used by airline flight crews can save the lives of sudden cardiac arrest victims aboard aircraft as well as be used for monitoring patients.

Doctors said 40 percent of those who were treated with the four-pound Automated External Defibrillator (AED) survived during a two-year study involving American Airlines. Their findings were published in today's issue of the *New England Journal of Medicine*.

The four-pound unit, like larger versions found in ambulances, clinics and hospitals, is used to restore cardiac activity with an electrical shock and monitor the heart. But unlike those used by doctors, nurses and paramedics, the smaller device is automated and requires less training to use safely.

"The AED figures out what it is supposed to do after it is connected to the patient," said Dr. Richard Page, the study's lead author and director of clinical cardiac electrophysiology at UT Southwestern.

AEDs were first put on over-water flights and then added to all other American Airline flights. Flight attendants received four hours of classroom and workshop instruction followed annually by a refresher course and examination.

Dr. Page, an associate professor of medicine, said a means of treating sudden cardiac arrest victims aboard airliners has been needed for years. "This is an isolated environment. If something goes wrong, there's not a backup immediately available. After 10 minutes, your chance of survival is extremely small. When you're in an aircraft and even if it is close to landing, that may take at least 20 minutes. If you get to someone fast, you have a high chance of resuscitation."

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Sudden cardiac arrest is usually due to ventricular fibrillation – a chaotic rhythm of the ventricle. "Once it occurs, chances of survival are reduced about 10 percent every minute after arrest," Page said. Sudden cardiac arrest is the leading cause of death in the United States with an estimated 250,000 to 300,000 cases per year.

The automated external defibrillator was used on 200 patients as a monitor and to administer shock.

"The victim must have the abnormal rhythm called ventricular fibrillation to require a shock," Page explained. "Not everyone who loses consciousness needs a shock. They may be in normal rhythm and have passed out or they may already be dead and not have a rhythm or have a flatline rhythm. In these cases, no shock should be administered."

Electrical shock was administered to 15 people experiencing ventricular fibrillation. Four of the 15 patients who received shocks had cardiac arrest in the airport terminal. None of these patients survived. The remaining patients receiving shocks had cardiac arrest aboard the aircraft. Of those 11 patients, six survived. After being removed from the aircraft, the six patients were transferred to the hospital and later discharged at their full functional status.

The rate of survival after defibrillation during the study from June 1997 to July 1999 was 40 percent.

"The percentage compares favorable with the rate of survival to discharge among patients who received a defibrillator shock in a setting other than an airliner," Page said. "The device was also safe when used as a monitor; in no case was an inappropriate shock recommended or delivered."

Page and his colleagues analyzed data collected from electrocardiograms (EKG) used to measure electrical activity in the heart. Using the EKG, cardiologists were capable of evaluating the function and safety of the device. EKG data were available for analysis in all but 15 cases.

The devices were approved for airline use in 1996 by the Food and Drug Administration. In 1998, the Aviation Medical Assistance Act was passed relinquishing liability for both airlines and for medically qualified passengers administering the procedure. "These devices are so simple

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that even an untrained volunteer could likely operate them successfully," Page said.

Other study researchers include Drs. Jose Joglar, Robert Kowal, Mohamed Hamdan, all assistant professors of internal medicine in the division of cardiology; Karthik Ramaswamy, postdoctoral trainee in clinical research; Saverio Barbera, postdoctoral trainee in clinical research; and Lauren Nelson, senior research nurse in cardiology, all from UT Southwestern; and Dr. David McKenas, Corporate Medical Director of American Airlines.

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