

Original URL: <http://www.jsonline.com/alive/news/nov04/273570.asp>

## Cardiac arrest survival soars with CPR tool

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Posted: Nov. 8, 2004

**New Orleans** - In new research pioneered in Milwaukee, an experimental CPR device designed to increase blood pressure in cardiac arrest patients dramatically improved survival, and could change the way paramedics treat patients around the world.

Tested in the field by Milwaukee area emergency medical personnel, the device more than doubled the 24-hour survival rate among pulseless cardiac arrest patients, compared with a group of patients whose CPR was done with a sham device.

"It has the potential to be pretty amazing," said Ahamed Idris, a professor of emergency medicine at the University of Texas Southwestern Medical Center.

The inexpensive device, designed to be used with a ventilation bag, creates more suction in the lungs, drawing oxygen-depleted blood back through the body more efficiently.

The device could represent a major breakthrough in treating cardiac arrest, which affects as many as 500,000 Americans each year, said Idris, who was not part of the CPR study but who has tested the device to improve blood pressure in astronauts after they return to Earth.

Lead researchers with the Medical College of Wisconsin, who conducted the first rigorous CPR field study of the device, presented their findings Monday at the American Heart Association's Scientific Sessions in New Orleans.

The study involved 230 Milwaukee-area cardiac arrest patients, including 52 people with pulseless electrical activity. Among the 52 patients, those who got CPR with the device had a 24-hour survival rate of 30%, compared with 12% for those whose CPR was done with a sham device.

In other groups of cardiac arrest patients, the device offered differing survival rates, but it always outperformed CPR without the device.

"This represents a huge advance . . . in a population which has had dismal outcomes," said lead researcher Thomas Aufderheide, a professor of emergency medicine at the Medical College and an emergency room physician at Froedtert Memorial Lutheran Hospital.

### 'Probably saved my life'

It's never a good time to go into cardiac arrest, but for Ken Lindstrom, 51, the timing could not have been better.

Lindstrom, of Greenfield, had just helped a neighbor move a heavy cement birdbath when he started feeling tired.

Before he could get to his bed to lie down, he collapsed on the floor, and for the next 22 minutes his heart would not beat normally on its own.

Lindstrom's son Chris started CPR, which was taken over by paramedics a short time later. His heart was shocked at least

### Advances in Heart Care



Photo/[Gary Porter](#)

Chris von Briesen (left) and Christopher Sparks demonstrate an experimental air valve at Froedtert Memorial Lutheran Hospital that was tested in Milwaukee.

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eight times by a defibrillator.

As it turned out, the paramedics who treated him were testing the experimental device.

"It probably saved my life," Lindstrom said.

The device, known as an impedance threshold device, is a one-way valve that is attached to a face mask or an endotracheal tube and is used with a ventilation bag. It essentially blocks air from entering the lungs during the decompression phase of CPR, thereby creating a vacuum in the lungs. That, in turn, draws more deoxygenated blood back from the veins of the arms and legs.

"It creates a suction," Aufderheide said.

He said blood pressure drops dramatically during CPR to as little as 20% of normal. But the device increases blood pressure to about 50%, he said.

"The device enhances circulation during CPR," Aufderheide said. "It nearly doubles blood flow to the heart and brain."

About half of cardiac arrests take place outside hospitals. Survival rates historically were extremely low, varying from as little as 1% in some areas to up to 10% in communities with quick-responding emergency medical systems.

In recent years, the advent of automated external defibrillators in public places for use by bystanders has improved survival by as much as two times.

Now researchers are excited that this new device may further improve survival.

A separate British study presented Monday compared short-term survival rates from using the device on about 1,200 cardiac arrest patients in Staffordshire, England, with past survival rates in CPR cases that did not use the device.

The study looked at only whether the patients were still alive upon arrival at the emergency room. But it found that survival with the device was about double, depending on the type of cardiac arrest.

While long-term survival data was not available, "We have assumed that increases in survival-to-hospital will equal survival generally," said lead author Roger Thayne, head of the Staffordshire Ambulance Service.

Thayne said the device will be standard for paramedics in his area.

"This device offers an improvement to cardiac arrest survival similar to that provided by the introduction of automated external defibrillators," Thayne said.

The device's approval for widespread use in the United States depends on a larger trial.

"The fact that it did so well (in the Medical College trial) is very impressive," said Patrice Nickens, a physician with the National Heart, Lung and Blood Institute, part of the National Institutes of Health, which funded the study. "It looks very promising. We are very excited about it."

Nickens said more research with the device is expected to begin by next year. That could involve several thousands patients, she said.

From the Nov. 9, 2004, editions of the Milwaukee Journal Sentinel  
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