

Wearable device can bring back heartbeat

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Most of the 250,000 Americans who die every year after their hearts suddenly stop pumping blood never had a chance.

They either collapse while no one is watching or die as efforts to revive them fail. But John Davies didn't need anyone to touch him when his heart started beating chaotically one evening in November.

The Orlando executive automatically got a life-saving jolt from a new type of defibrillator that is worn like a vest underneath clothing. The device increasingly is being used for people at high risk of sudden cardiac death.

Recent heart-attack victims, new bypass-surgery patients, people awaiting heart transplants and many others might be helped by the technology.

"There's a significant number of people who could benefit," said Dr. Ken Kronhaus, a Lake County cardiologist and spokesman for the American Heart Association. "It's just starting to catch on because doctors are still getting experience with it. But this does have a place in what we can do to save lives."

The technology itself isn't new. Doctors first learned how to shock the heart back to life in the late 1940s, and they've been implanting defibrillators inside patients since the 1980s.

The devices deliver shocks to restore a normal rhythm if the heartbeat goes out of whack, often too fast, and then lapses into a useless quiver. In this state, called cardiac arrest, the heart cannot pump effectively and the body is starved for blood.

Cardiac arrest kills thousands every year. Most die before they reach a hospital. Some patients have never had a symptom before their hearts suddenly stop.

But in many cases, the risk is predictable, said Dr. Peter Taylor, a cardiologist and electrophysiologist with Mid-Florida Cardiology Specialists and Orlando Regional Medical Center.

Doctors judge a heart's pumping ability by a measurement called an ejection fraction. Healthy hearts have a fraction of 55 or higher. When the value falls below 35, patients are at much higher risk of cardiac arrest.

Candidates for a wearable defibrillator include recent heart-attack patients with low ejection fractions and those who just have gotten a clogged artery cleared by angioplasty or open-heart surgery.

Taylor said doctors don't like to rush into implanting a defibrillator in the chest if it can be avoided.

"There's a good chance that the heart will improve on its own with medication," he said.

That's where the vest comes in. Made by a Pittsburgh-based company called ZOLL Lifecor, the vest can be used while doctors wait to see how much the heart rebounds. Medicare and other insurers now cover use of the defibrillator, which costs about \$3,200 a month to lease.

Taylor prescribed it for Davies after an irregular heartbeat sent the 64-year-old to the hospital for testing. Davies was diagnosed years ago with a condition called cardiomyopathy that can weaken the heart. But it hasn't given him much trouble until recently.

Only two days after leaving the hospital, Davies needed the vest. He suddenly felt weak and near blacking out as he walked across his kitchen one evening. His wife was helping him to the sofa when the device boomed out a warning to stand clear.

Davies was rejuvenated by a single jolt. He even was able to give directions on the phone for the ambulance that his family had summoned.

Today, he has an implanted defibrillator in his chest. But he is grateful that the wearable version was an option.

"I keep thinking that if I had been discharged [from the hospital] 15 years ago and I wouldn't have had" a vest to wear, said Davies, senior vice president of construction for a development company. "I would have died."

For now, there is only one wearable defibrillator on the market, said Jason Whiting with ZOLL Lifecor. He said the vest was approved by the government in 2002, and its use has grown as more insurance companies are willing to pay for it. About 12,000 people have used it to date.

The vest can be worn 24 hours a day, except during showering or bathing. It sounds loud alarms before firing and also gives people the option of preventing a shock by holding down buttons.

A word of caution: The vest is not suitable for everyone, including people with vision or hearing problems, Kronhaus said. The device may react to an irregular rhythm while the person is still conscious, prompting the need to manually delay the firing. Otherwise, a shock to a conscious person is very unpleasant.

People with vision or hearing problems may not get the warnings, Kronhaus said. It also would be inappropriate for patients who already have implantable defibrillators or those with mental impairments that might keep them from understanding its operation.

Credit: Robyn Shelton, Sentinel Medical Writer

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