

SMALL BUSINESS

In this case, cool is life-saving

Suit freezes body to fight cardiac arrest

By **CAROL FLETCHER**
STAFF WRITER

Dr. Robert Freedman wants health-care workers to think cool when it comes to reviving cardiac-arrest survivors.

He means that literally – as in freezing them.

He and the other founders of Life Recovery Systems HD LLC in Waldwick want hospitals to try the body-immersing cooling system they have developed to prevent the brain cell damage that often kills or retards those who survive cardiac arrest.

“The faster you cool, the faster you stop that mechanism and the more brain cells you save,” said Freedman.

Freedman, an interventional cardiologist, started LRS in 2003. He consulted on cardiac research for cardiac medical device maker Datascope Corp. in Montvale and formed the company with three employees of the company.

The team developed the ThermoSuit System from Freedman’s idea for an immersive system that quickly freezes cardiac-arrest survivors who show signs of brain damage. Ninety percent of cardiac-arrest victims don’t survive, said John DiLiddo, one of LRS’s co-founders and vice president-sales and marketing.

Freedman and his team believed that the very low survival rate discouraged research and technology from progressing much past successful test studies done on cooling cardiac-arrest survivors as far back as the 1940s.

“We wanted to start a company that brought new technology to the resuscitation field,” Freedman said.

The suit they created looks like a plastic raft that inflates around a person, with ice water pumped from a mobile electrical case. Water pours onto and under the body, and is recycled back into the case for re-chilling. The case also monitors body tempera-



From left, Marc Cote, Milt Frank, John DiLiddo and Bob Schock of Life Recovery Systems with the ThermoSuit, a body-cooling system the company invented. They hope hospitals will use it to try to reduce brain damage in cardiac-arrest victims.

ture through tubing in the body.

It’s all about time and beating an oxygen-starved brain’s cell-destruction process, said Freedman and co-founder Dr. Robert Schock, vice president-head of research and development.

“The quicker you get them to target temperature [about 33 degrees Centigrade], the quicker you stop the brain damage,” Freedman said.

The LRS team says its system cools the body to that temperature in about 30 minutes, whereas competitors’ techniques, such as blankets, take about four hours.

The difference? Immersing the body completely in ice water, Freedman says. Another plus, he says, is that patients in the ThermoSuit come

in direct contact with water rather than through materials that can burn skin.

Freedman and his team face two major challenges: reversing health-care workers’ core training to keep patients warm and the health-care industry’s opposition against testing new technologies and treatments for cardiac-arrest survivors because most eventually die from brain damage.

“That [mentality] is the obstacle that any innovative medical device faces,” said Chief Operating Office Milton Frank, who also heads Nexcore Technology Inc., the medical device company that builds the ThermoSuit electrical case and shares the Waldwick facility with LRS.

There have been some break-

throughs. In 2002, the New England Journal of Medicine reported cooling successful cardiac-arrest survivors “increased the rate of a favorable neurologic[al] outcome and reduced mortality.”

In 2006, the American Heart Association Inc. cited cooling in its guidelines for reviving patients from comas following cardiac arrest.

Last year, the LRS team presented the association with case-study results from Austria’s University of Vienna that reported 80 percent overall survival rates from the ThermoSuit System – the highest ever reported – for patients resuscitated from coma after cardiac arrest, Freedman said. Plus, similar animal studies showed decreases in brain damage.

Life Recovery Systems HD LLC

Founded: 2003

Owners: Dr. Robert Freedman, John Di Liddo, Marc Cote, Dr. Robert Schock

Revenue: Just under \$1 million

Employees: Six

Web site: Life-recovery.com

Advice: “Share the risk and the reward with them,” Freedman said. “If you can’t pay people you started the company with, make them part owners.”

Freedman cites about 100 successful survival cases using the ThermoSuit, and Schock described a 22-year-old man from Kingston General Hospital in Ontario, Canada, whose breathing was cut off for 20 minutes. His only aftereffect was some short-term memory loss, Schock said.

The ThermoSuit System was cleared by the Food and Drug Administration to be marketed for body-temperature reduction, and LRS began selling it in late 2007.

The complete system sells for \$31,600; the actual suit is disposable and costs \$1,600. The pump and electronic case sell for \$30,000. Ten systems have been sold so far, and between 15 and 20 systems are under consideration at hospitals in the U.S., Canada and Europe.

Hypothermia for cardiac-arrest survivors is considered a protocol, and according to LRS, only 20 percent of all hospitals cool their patients.

Hospitals must have cooling guidelines in place or adopt them as a hypothermia program before using the ThermoSuit System.

“We really have to market [the process of] hypothermia and a new product,” Freedman said. “It’s a new idea.”

Looking ahead, Schock and the others said they are seeking funding to do clinical trials that would test the device’s ability to minimize heart attacks.

A National Institutes of Health grant for the trials is pending.

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