

Where the Heart Is

Hibernicor offers a heart transportation device that can keep donor hearts healthier during the critical commute to their new owners.

▲ According to the Organ Procurement and Transportation Network and the Scientific Registry of Transplant Recipients, roughly 3,700 Americans await heart transplants each year. Yet only 2,314 donor hearts are available, on average. When a heart does become available, it needs to get to the patient quickly, in order to reduce the likelihood that the body will reject it after surgery.

Andrew Rivard, a research consultant at the University of Minnesota's Department of Surgery and a resident physician at the University of Florida, believes he

has a better way to deliver those hearts. Traditionally, this has been performed via a basic handheld cooler. However, Rivard says, this method has a key limitation: Once the heart is placed in the cooler, it can reside there for only three to four hours before the tissue rapidly starts to die. The innovation developed by Rivard and the company he founded in 2002, Edina-based Hibernicor, prolongs the heart's life by perfusing it, or providing it with a steady flow of a synthetic blood substitute, while en route. Donor hearts thus can cover greater distances and arrive



Andrew Rivard, with Jordan Milan, Hibernicor's marketing vice president, believes his transport unit will improve the "lifespan of transplant organs."

in better shape than those stored on ice, Rivard says.

"There has been an ample amount of scientific evidence that shows that if you perfuse the heart—provide a means for delivering energy and electrolytes—that keeps the heart cells alive," Rivard says. "Before today, though, the pumps for providing flow were too heavy and the computers [that control the perfusion] were too large to practically make a device like this portable."

Rivard turned out the first prototype of his device in 1999. A U of M medical student at the time, he'd received grants from the Minnesota Medical Foundation and the American Heart Association. Rivard designed the device and its proprietary software in collaboration with Roger Christen, a mechanical engineering student at the university. Their device also uses a hand-

held cooler, but this one's outfitted with a lightweight aluminum pump and a touchscreen-controlled microcomputer. The entire unit weighs 25 pounds. St. Paul-based medical-device manufacturer Minnetronix is making the product in exchange for 25 percent ownership of Hibernicor.

Now seeking a CEO for his company, Rivard plans to apply for FDA approval of the device by year's end. Once it's on the market, Rivard expects Hibernicor's first-year sales to total \$1.2 million—30 devices at \$40,000 each. Rivard also plans to sell disposable units that contain the heart within the cooler and must be replaced after use.

"We'd like to control the donor heart market," Rivard says, "and then move into other organs," including livers and kidneys.

—Andrew Bacskai