



Innovators *at* Heart

News from the
Lillehei Heart Institute
at the University
of Minnesota

University's heart transplant program celebrates its 30th anniversary

For cardiovascular surgeon Lyle Joyce, M.D., Ph.D., it's still a vivid memory. As a surgical resident at the University of Minnesota in 1978, he scrubbed in with Demetre Nicoloff, M.D., Ph.D., and William Lindsay, M.D., to perform Minnesota's first heart transplant.

The world's first heart transplant had been done about a decade earlier in South Africa by Christiaan Barnard, M.D., who trained under University surgery legends Owen Wangensteen, M.D., Ph.D., and C. Walton Lillehei, M.D., Ph.D. But in the late 1960s, the transplantation process needed improvement—those who survived surgery eventually died when their bodies rejected their new hearts.

By 1978, Joyce says, better immunosuppressive drugs had become available. Though the new drugs were effective in people who'd had kidney transplants, doctors didn't know whether they would work in heart transplant patients.

The University's pioneering surgical team decided to find out.

"There was a certain sense of experiencing a miracle when I saw the empty chest be filled by a completely still donor organ that spontaneously started beating once it was sewn in and received blood," says Joyce, now a professor of surgery at the University. "Strange as it may seem, I still have the same sense of awe during each heart transplant, even after 30 years and hundreds of transplants."

Anti-rejection drugs continued to improve over the next few years, and in 1986 University surgeons performed Minnesota's first heart-lung transplant, and a year later, the state's first heart-kidney transplant.

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One of the world's longest-living heart transplant survivors, Cheri Lemmer, here with cardiologist Marc Pritzker, M.D., is now almost 28 years post-transplant.



Today more than 650 heart transplants have been performed at the University's hospitals. Sixty of those have been for children.

Leaders of the University's heart transplant program are proud of their many firsts. But today they have a new goal: preventing the need for transplants altogether. There just aren't enough donor organs for everyone who needs them, says Daniel J. Garry, M.D., Ph.D., director of the cardiology division in the Medical School's Department of Medicine and executive director of the Lillehei Heart Institute.

So instead, they're aiming to build better, more durable devices that help prolong life for

people in heart failure who aren't eligible for a transplant and to improve quality of life for those waiting for a new heart.

Joyce now directs the Ventricular Assist Device (VAD) Program at the University of Minnesota Medical Center, Fairview, one of the country's premier centers for this procedure. VADs are small pumps that, when implanted into the heart, take over the work a failing heart can no longer do on its own. Since University surgeons performed Minnesota's first VAD implantation in 1995, another 350-plus lives have been extended or improved through this procedure here.

University physicians and scientists are also exploring ways to prevent heart failure and promote regeneration after heart damage using cell therapy.

And for those who still need heart transplants, they are working to develop new immunosuppressive drugs with fewer side effects, a better donor-recipient matching system, and ways to recellularize cadaver hearts to help make more organs available for transplant.

"The program today is focusing on innovation," Garry says.

A new partnership

Heart physicians at the University of Minnesota are now part of an even larger network of cardiovascular experts.

On October 1, University of Minnesota Physicians—the physician practice group for the University's Medical School faculty members—and Edina-based Minnesota Heart Clinic merged their cardiology programs and, together with Fairview Health Services, are creating a new, integrated cardiovascular program.

It's a high-profile partnership. The University of Minnesota Medical Center, Fairview is rated in the top 50 hospitals nationally for heart and heart surgery on *U.S. News and World Report's* 2008 "Best Hospitals" list, and Minnesota Heart Clinic and Fairview Southdale Hospital are rated No. 1 in

Minnesota this year in cardiology and cardiac care by HealthGrades, an independent health-care ratings organization.

Bringing community and academic doctors together through the merger creates one of the largest cardiology programs in the state.

"Patients will benefit most from this award-winning collaboration," says Daniel J. Garry, M.D., Ph.D., the Medical School's cardiology chief and Lillehei Heart Institute executive director. "They will have access to the latest research innovations as they are applied directly to care."

The merger also moves the three organizations toward a long-term vision for leading-edge patient services that aim to transform how cardiovascular care is delivered to patients throughout the region.

Foundation puts its money into heart health

Even before the plane taking him to his fellowship interview landed, Santiago Garcia, M.D., knew that he wanted to continue his cardiology training at the University of Minnesota.

At an American Heart Association meeting in 2004, Garcia had attended a session on the most influential clinical trials in cardiovascular medicine.

“I remember that two out of the 10 most influential clinical trials came from this University,” he says. “For any trainee interested in clinical cardiology and medical research, the cardiology fellowship program at the University of Minnesota offers a unique opportunity to be trained by the best in the field.”

And thanks to generous support from the Fred C. and Katherine B. Andersen Foundation and other sources that fund their training program, Santiago and other research fellows can continue to learn from the University’s—and the world’s—best. They are taught to attack cardiovascular disease from several angles, to treat disease, detect heart problems earlier, and ultimately prevent heart damage from occurring in the first place.

That 360-degree approach to heart disease made a lot of sense to the Andersen Foundation board of directors, says president Jerold Wulf, especially the prevention aspect.

“When we first heard about it, there really wasn’t a lot of information on individual health habits and physical [factors] that might have an

impact on heart disease,” Wulf says. “It seemed like something that really needed to be done. It was a brilliant plan, in our opinion.”

So they stepped up to help turn the plan into reality. From 2000 to 2006, the foundation had given a total of \$2.25 million to the Friends of Cardiology Fund, which supports fellow education as well as research and patient care in the Division of Cardiology.

In June, the Fred C. and Katherine B. Andersen Foundation pledged another \$1.25 million to fund heart disease prevention programs, including research initiatives and training for cardiology fellows studying disease prevention.

Additionally, the foundation has committed \$2 million to fund the Fred C. and Katherine B. Andersen Foundation Chair in Adult Clinical Cardiology, which will be used to recruit an internationally recognized leader in that field.

“The Andersen Foundation’s ongoing support will lead us to new discoveries that will improve the quality of life for patients with heart disease and revolutionize our strategies to prevent it,” says cardiology division chief Daniel J. Garry, M.D., Ph.D. “It will have a worldwide impact on patient care.”



*Cardiology fellow
Santiago Garcia, M.D.*

Photo by Scott Strebler

Thanks to recent individual retirement account (IRA) legislation, people age 70½ or older can once again make outright gifts using IRA funds without adverse tax consequences.

If you are required to receive minimum distributions from your IRA and do not need the money for personal use, consider using those funds to make a gift to health-focused research, education, or care at the University of Minnesota through the Minnesota Medical Foundation (MMF). Although you cannot claim a charitable deduction for the IRA gifts, you will not pay income tax on the gift amount.

You may contribute funds to qualified charitable organizations such as MMF through this legislation if you are 70½ or older, if qualified charitable distributions from your IRA total \$100,000 or less for 2008 and for 2009, and if you transfer funds directly from an IRA.

Don’t miss this second chance to make tax-free gifts from your IRA. For more information, contact Mark Parsons at 612-625-2298, 1-800-922-1663 (toll free), or m.parsons@mmf.umn.edu, or visit www.mmf.umn.edu and click on “Gift Planning.”

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Forging into the future of heart surgery with robotics



*Kenneth Liao,
M.D., Ph.D.*

For decades, patients around the world have experienced the benefits of the University of Minnesota's innovations in heart care. And just as the pioneering spirit of yesterday gave rise to lifesaving solutions such as the pacemaker and open-heart surgery, cardiovascular surgeons at the University today are advancing the field of robotic heart surgery.

Kenneth Liao, M.D., Ph.D., for example, performed Minnesota's first robot-assisted coronary artery bypass graft (CABG) in 2003. Since then, he has performed more than 50 such procedures.

Robot-assisted surgery can offer several benefits over traditional "open" surgery. Using the robotic arms of the da Vinci® Surgical System, surgeons can manipulate surgical instruments with tremor-free movements. They direct the robot's arms through two tiny incisions, avoiding the need to open the patient's chest and separate the rib cage.

Not surprisingly, people who undergo robotic procedures typically have shorter hospital stays than those who have traditional open-heart procedures—three or four days compared with a week to 10 days with traditional surgery—and heal faster.

But to Liao, head of robotic and minimally invasive cardiac surgery at the University, there is always room for improvement. Surgeons and cardiologists are now working together on "hybrid" procedures for patients who have damage on both sides of their heart.

In these hybrid procedures, a surgeon performs robot-assisted CABG surgery—usually on the left side of the heart, which benefits most from CABG—and a cardiologist stents the arteries on the right side. "Before hybrid procedures, we would do both the left and right repair with open-chest surgery," says Liao. "That can be a difficult procedure to recover from, particularly for older patients."

University heart experts are discovering other uses of the technology as well, including using the robot to place pacemaker leads in the left side of the heart, eliminating the need for open-heart surgery.

Today the University's expertise in robotics is sought across the globe. "It's exciting because the University of Minnesota has this culture of letting you do innovative things," Liao says. "That makes it a great place to work—and a great place to keep building on what we have done so far."

—Jeanne Mettner

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