

First heart-lung transplant surgeon discusses procedure

March 10 2016, by Sara Wykes



Bruce Reitz (left) and Norman Shumway (right) perform the first successful heart-lung transplant in 1981 at Stanford Hospital. Credit: Stanford School of Medicine

On March 9, 1981, just minutes past midnight, Mary Gohlke, a 45-year-old Arizona woman dying of primary pulmonary hypertension, was wheeled into a Stanford Hospital operating room for a heart-lung transplant surgery that would become a medical milestone.

For many months, as her health failed, Gohlke had waited, stuck: Lung transplants were technically feasible, but no human lung transplant patient had survived more than 23 days.

The only antirejection drugs then approved for use interfered with the healing of the surgical wounds where new lungs connected to the patient's airway. After Gohlke read a newspaper story about the successful heart-lung transplants Stanford cardiothoracic surgeon Bruce Reitz, MD, had done on rhesus monkeys, she telephoned him. Reitz took the call. She asked him how many heart-lung transplants he planned to do that year on humans. He said 10. She told him she'd like to be the tenth so she "could see how the rest of them turn out," and Reitz responded with a chuckle.

The holdup, however, was the U.S. Food and Drug Administration. It had approved a better antirejection drug, cyclosporin A, for heart-transplant patients, but not for other transplant patients. Stanford had asked the FDA to approve cyclosporin A for heart-lung transplant patients, too—and then waited and waited. Gohlke, increasingly desperate, asked her former boss, the executive editor of the Mesa Tribune, to help. He made calls to then-U.S. Sen. Dennis DeConcini, D-Arizona, and about an hour later the FDA approved the drug for use in heart-lung transplantation at all qualified hospitals. Gohlke received her new heart and lungs—becoming the first patient in the world to undergo a successful heart-lung transplant—and lived for five years with her new organs.

Reitz, the Norman E. Shumway Professor, Emeritus, talked with writer

Sara Wykes, about that first surgery—and the work that came before it.

Q: How did you become involved in doing heart-lung transplants?

Reitz: As an undergraduate physiology major at Stanford, I had done research with a professor studying the immunological reactions of the heart. Then, in 1969, when I was still a medical student, I asked about working in the research lab run by Dr. Norman Shumway, chief of the Division of Cardiothoracic Surgery and the father of heart transplantation. Eighteen months earlier, he and his team did the first successful adult heart transplant in the United States. He said yes. After I finished my residency in cardiac surgery, I came back to the lab. I asked Dr. Shumway what needed to be done, and he said he'd like to see if we could make some progress in combining heart transplantation with complete bilateral lung transplantation. There were patients with congenital heart defects and patients with severe lung disease who currently could not be treated by transplantation. Mary Gohlke, whose heart had been damaged by her disease, was exactly that kind of patient. Nor did we have a way to transplant lungs then except as part of a heart-lung package.

Q: What were the first steps?

Reitz: We began by doing auto-transplants: Taking the organs out and replacing them in the same animal. We were using rhesus monkeys. That helped us establish the techniques of the surgery without organ rejection. Then we started looking at the antirejection drugs then in use, but they just didn't work.

Q: How did you solve that problem?

Reitz: A new immunosuppressive drug known as cyclosporin A had been developed in Europe by Sandoz Inc. This compound, after experimental and clinical work by professors Roy Calne and David White at Cambridge University, seemed to provide much better immunosuppression. In the summer of 1978, White visited Stanford and gave a seminar to a small group of the heart transplant team. Sandoz agreed to give the Stanford laboratory some of the drug. We could see that when we used it on our monkey transplants that it was very effective: It prevented rejection but allowed good healing of the transplant connection at the trachea and quick recovery of the animals to apparently normal pulmonary and heart function.

Q: What held you back from its use in heart-lung transplant?

Reitz: By early fall of 1980, we began to think about potential patients. The Food and Drug Administration and the Stanford Institutional Review Board gave approval for a clinical trial with heart transplants. The first heart transplant trial patient to get cyclosporin was operated on in December 1980. He and subsequent patients showed improved postoperative recoveries that were clearly different from those of the previous patients receiving steroids and a different immunosuppressant medication. But the FDA had not approved cyclosporin's use for anything other than heart transplant. Then Mary Gohlke made that phone call to her boss, and the FDA gave a blanket approval for Stanford and other qualified medical centers to use the drug for heart-lung transplant.

Q: What was the surgery like?

Reitz: We had a double-sized team of doctors—one for the donor and one for Mary Gohlke. It included Dr. Shumway; Dr. John Wallwork, then a transplant fellow and now chief of cardiothoracic surgery at

Papworth Hospital in Cambridge, England; Dr. Edward Stinson, who had partnered with Dr. Shumway for the first [heart transplant](#) surgery; and Dr. Philip Oyer, who went on to co-develop and implant the first mechanical ventricular assist device. The appearance of Mary Gohlke's totally empty chest was indeed a dramatic moment. I wondered, "Is this really going to work out?" But the implantation went smoothly, the heart resuscitated quickly, and lung function was adequate immediately. We finished up about six hours later. Mary made a steady improvement. It was such a transformation for her! To take someone back from the brink of death and give them health—that's one of the great things about transplant and about being involved in transplant. When she died five years later, she did not have any findings of chronic rejection in either her lungs or heart at the time of death. Her spirit, courage, determination and, ultimately, her willingness to explore the unknown, to be the first, made possible the era of therapeutic lung transplantation.

Provided by Stanford University Medical Center

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