

Paired donations give organ transplants a brighter future

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By Mark Roth, Pittsburgh Post-Gazette

When Lora Wilson of Churchill decided to donate one of her kidneys last year to anyone who needed it, she got an unexpected reaction.

While most people supported her decision to become a living kidney donor, some were completely thrown by her wish to become an "altruistic" donor, giving her precious organ to someone she didn't know.

"When I started telling people," Ms. Wilson said, "some of them really couldn't get the altruistic part. Sometimes I would tell somebody, and they would actually burst into gushing tears!"

As it turned out, the patient who got Lora Wilson's kidney didn't stay a stranger for long. Dolores Iannacone met Ms. Wilson after the surgery, when they were still in the hospital at UPMC Montefiore, and they now talk every week.

Ms. Wilson, executive director of Pittsburgh Bone & Joint Surgeons in McKeesport, made her momentous decision largely because her husband, Robb, had received a kidney and pancreas transplant eight years ago that saved his life.

She represents a group of people who may help create the next big breakthrough in organ transplant surgery.

It's known as paired kidney donation, an attempt to ride the crest of a growing wave of living kidney donors.

Most living kidney donors give their organs to people they know. But a large number who volunteer to donate can't do so because their blood types or other biological factors make them a poor match with the person they know.

Paired kidney donation gets around that problem by swapping organs to create better matches. In the simplest form, one patient's mismatched donor would give his kidney to another patient, and that recipient's donor would give his organ to the first patient.

The doctors and other scientists who are promoting this kind of kidney swapping say it can work better if there are sometimes three or four pairs of people involved, and can be enhanced even further if an altruistic donor like Ms. Wilson can trigger a chain of organ exchanges.

In fact, going up to four-way exchanges can accommodate nearly every match possible in a large database of people, said Utku Unver, a University of Pittsburgh economist who helped pioneer computerized kidney matching with colleagues Alvin Roth of Harvard University and Tayfun Sonmez of Boston College.

Fewer than 200 paired kidney donations have taken place to date, but the networks being set up to promote such exchanges are growing rapidly, and some experts predict they could account for as many as 2,000 kidney transplants a year in the future.

Living kidney donors now comprise nearly 40 percent of the 17,000 transplants done each year in the United States. It's the one area where there has been some success in erasing the chronic gap between people waiting to get organs and those willing to donate them.

While only a handful of living kidney donors have given their organs to people they didn't know, as Lora Wilson did, they can have a disproportionate impact in creating optimal matches in a kidney exchange network.



Rebecca Droke, Post-Gazette

After having renal failure caused by diabetes, Robb Wilson (here with his wife, Lora, at their Churchill home), received a kidney and pancreas transplant in 1999 from a donor who had died. His wife couldn't donate one of her kidneys to her husband, but she later gave one in an altruistic donation to a stranger.

Click photo for larger image.

Listen in

AUDIO **Lora Wilson explains how she began thinking of becoming an altruistic donor after her mother died in August, 2005.**

AUDIO **Lora Wilson gives some of her thoughts on the value of being an altruistic donor.**

AUDIO **Robb Wilson tells a story of a woman who can't bring herself to meet the recipients of her dead daughter's organs, but is saving messages from them to give to her daughter's children.**

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That showed up in one recent computer matching run performed by the Alliance for Paired Donation, based in Toledo, Ohio.

Using software invented by Carnegie Mellon University computer scientists, the Alliance discovered that if it did not include any altruistic donors, it could find only one two-way exchange among its 100 patient-donor pairs, said Dr. Michael Rees, Alliance medical director.

Tony Tye, Post-Gazette

Abeid "Bey" Johnson, 35, of Knoxville, is hoping to join Pittsburgh's kidney exchange network, but first, he needs to find a donor who could give a kidney to someone else so that Mr. Johnson can get one in return. His mother and brother volunteered, but she was the wrong blood type and his brother turned out to have high blood pressure. Now, he is waiting to see if an aunt or a friend passes the screening tests to become a donor. Through performances by his singing group, Artistree, and other outreach efforts, Mr. Johnson has raised about \$17,000 toward a kidney transplant. In the meantime, he goes to dialysis three days a week at Fresenius Medical Care in Mount Oliver.

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"These surgeons are literally on the cell phone with each other sometimes, saying 'OK, I'm going to start now,' " said Dr. Tuomas Sandholm, one of the Carnegie Mellon scientists who developed new computer matching software.

The other big advantage: Living kidney donations last much longer than those that come from people who have died. The average cadaver kidney lasts about 11 years, while the average living kidney lasts 20 years.

The Alliance for Paired Donation is one of four voluntary kidney exchange networks in America.

The largest one, the Paired Donation Network, is also based in Ohio, and its new president, Dr. Ronald Shapiro, is director of pediatric kidney transplantation at Children's Hospital here.

Pittsburgh's CORE, the Center for Organ Recovery and Education, which coordinates organ transplants in this region, just started listing patient-donor pairs in October on the Paired Donation Network's database, but has not arranged any local kidney exchanges yet.

Two slightly older networks are the New England Program for Kidney Exchange, based in Boston, and a program run by Dr. Robert Montgomery at Johns Hopkins University in Baltimore.

Outside the country, there is a paired donation network in the Netherlands and a highly successful one in South Korea, which is known for its high rate of altruistic donors.

Most other organ donations are governed by a national organization known as UNOS, or the United Network for Organ Sharing. Toledo's Dr. Rees would like to see UNOS set up a national database for kidney exchanges as well, but not yet.

"I don't think UNOS is in a position to run it now," he said, partly because its staff lacks the expertise, and partly because the existing networks can try out different strategies to find the best way of matching donors and recipients.

One reason UNOS has been slow to move into the kidney exchange arena is that until recently, it was unclear whether these swaps were legal.

To prohibit buying and selling organs, U.S. law says no "valuable consideration" can be given in exchange for an organ. The question in this case was whether giving one kidney for another violated that rule.

About a month ago, though, the Department of Justice ruled that kidney exchanges are legal, opening the way for a national network.

Dr. Steve Woodle, chief of transplant surgery at the University of Cincinnati and a founder of the Paired Donation Network, estimated that there may already be 3,500 to 8,000 Americans who have volunteered to donate a kidney to a friend or relative but are not compatible, and who could become part of a national database.

"The computer matching techniques are an important part of paired donation," Dr. Woodle said, "but the most important part right now is getting the patients identified and educating the transplant groups" about how important kidney exchanges can be.

One vital part of the educational campaign may be letting potential donors know that today, the surgery to obtain a kidney is not only extremely safe, but can often be done laparoscopically, by inserting tubes through tiny incisions.

But when it included the few altruistic donors, it was able to create one potential four-transplant chain, three three-transplant chains and four two-transplant chains, Dr. Rees said.

In a four-way chain, the altruistic donor's kidney would go to pair A, whose kidney would go to pair B, whose kidney would go to Pair C, and that final pair's kidney would then become available for another altruistic donation.

Ms. Wilson said her doctors suggested at one point that her kidney might be able to trigger such an exchange, but final blood tests ruled that out.

While doctors can match kidney patients and donors ahead of time based on their blood types and certain white blood cell markers, they still have to do a last-minute blood mixing test to see if the two people have strong antibody reactions to each other.

These 11th-hour "crossmatch" failures are another reason why kidney exchanges would work best with a larger database.

Although the chief motivation of kidney exchange programs is to increase the number of successful transplants, they also play off the hope that someone will be more willing to donate a kidney if his loved one will get one in return.

To make sure no one changes his mind at the last minute, the transplant surgeons doing exchanges plan them to start at the same time.

That hastens recovery time and reduces pain, Pittsburgh's Dr. Shapiro said, and may require a donor to be off work for only two to three weeks.

"It's still major surgery, of course," he said. "I tell patients that the first day after surgery they feel like a truck hit them; the second day like an SUV hit them; and the third day like a VW Beetle hit them; and then the fourth day they can go home."

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