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Kidney Swaps Seen as Way To Ease Donor Shortage

By LAURA MECKLER
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There are nearly 75,000 patients in the U.S. awaiting kidney transplants. To move more people off the wait list, surgeons are trying to expand a complex new practice, kidney-swapping, that has helped a small but growing number of people like Robyn Brandon.

Soon after Mrs. Brandon got off the "Tower of Terror" ride at Disney World in July 2004, she began feeling sick. The next day, her urine was full of blood. "I was in so much pain," she says. "I thought my kidneys were going to explode." Three weeks later, her kidneys failed, the result of a flare-up of a rare disease, and she went on dialysis.

MAKING MATCHES

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Doctors put Mrs. Brandon, then 43 years old, on the kidney-transplant waiting list. Her husband volunteered to donate a kidney, but tests uncovered a problem: Because her blood was highly sensitive, she would reject most kidneys. The chance of finding a suitable match was 1 in 500 -- and her husband wasn't the one. Increasingly despondent and exhausted by three-times-a-week dialysis, the once-effervescent mother of four spent hours curled up in a chair in her Maryland home, gazing at her tropical fish.

In Half Moon Bay, Calif., 48-year-old Patrick Barron was also desperate for a new kidney. His wife wanted to give one of hers, but the two had different blood types and so were a medical mismatch as well.

Across San Francisco Bay, about 40 miles away, Jeonja Jeon, a Korean woman who had come to the U.S. a few years before, had a similar problem. She needed a new kidney but her husband's blood type was different than hers.

Through an unlikely route, the three couples wound up helping each other, with the aid of Robert Montgomery, a Johns Hopkins surgeon. Dr. Montgomery ultimately choreographed a three-way exchange involving the couples -- one African-American couple; one Korean couple, and one couple with a Caucasian husband and Japanese wife. The healthy member in each couple would donate a kidney -- not to his or her own spouse, but to a stranger who is a medical match.

Along the way, the kidney swap would involve a dozen

doctors and nurses in hospitals on opposite coasts, a confrontation between physicians and emotional debates between spouses over life-and-death decisions.

Dr. Montgomery, 47, is a leading proponent of "kidney paired donation," in which pairs of incompatible donors and recipients are matched with others. Then kidneys are swapped, so that each donor gives a kidney to a stranger; surgeries are performed simultaneously so donors don't back out after their partners receive kidneys. The practice, limited so far, could lead to a major change in the nature of kidney donation.

The first U.S. kidney swap occurred without fanfare in 2000 at Rhode Island Hospital in Providence after two women were admitted in the same week needing transplants. Both had grown children who wanted to donate kidneys, but weren't medical matches. One mother had blood type A, while her son had type B; the other mother and her daughter were the opposite. A member of the transplant team brought up paired exchanges, which were being done in South Korea. "We thought, 'Why don't we just try this?'" says Bette Hopkins Senecal, the nurse manager for transplants.

Since then, there have been about 230 exchanges. The slow growth partly reflects concerns that trades might violate a federal ban on selling organs. But Congress is expected to pass a law clarifying that such arrangements are legal, codifying a recent Justice Department ruling.

A Big Addition

Some experts estimate that eventually there could be as many as 4,000 kidney exchanges a year. That would be a big addition to the 6,400 kidney transplants performed last year involving living donors. An additional 10,600 transplants involved kidneys from deceased donors. Waits for organs from deceased donors can run to five years or more.

As interest in kidney swaps grows, logistical, medical and ethical questions are emerging. One of the fundamental issues: Who should get first dibs on a match? A donor with blood type O, for instance, can give to patients of any blood type and might match with hundreds of pairs. One combination might allow for two transplants; another, for 10, because it allows other matches to occur, in a kind of domino effect.

In the early kidney swaps, surgeons matched pairs using a pencil and paper or by moving magnetic pieces around on a board. Today, computer experts, working with economists, are developing programs to "optimize" matching, to enable the greatest number of transplants. They're employing mathematical techniques used for major-league baseball schedules, airline departures and online driving directions.

"It quickly and efficiently considers all possible solutions and picks the best one based on your criteria," says Dorry Segev, a transplant surgeon who directs clinical research at Johns Hopkins School of Medicine.

Rising interest has fueled calls for a national system to arrange swaps, perhaps run by the United Network for Organ Sharing, the nonprofit group that has a federal contract to allocate organs from deceased donors. Such a database could give hard-to-match patients their best chance. But it would face the same questions that have dogged allocation of deceased-donor organs, including who gets matched first. In a 20-page proposal on a kidney-swap system, the network suggested

extra points for hard-to-match patients, children and former donors, among others.

Another ethical concern is whether to expand living donor transplants so dramatically when, according to donor advocates, there is still a dearth of protections for living donors. The daisy-chain effect of the arrangements could make it harder for donors to back out. Patient advocates also worry about expanding living donation without putting in place more programs, such as long-term tracking of donors, which would help others make better-informed decisions about the surgery.

Complicating the picture: transplant surgeons, some of whom are highly competitive and focused on their own programs rather than joining networks with other hospitals. "When big egos come together, sparks fly," says Bill Bry, surgical director of kidney transplantation at California Pacific Medical Center in San Francisco. An Ohio paired-donation network recently split into two when surgeons quarreled.

Some surgeons have criticized Johns Hopkins, which has done more than 40 swaps -- more than any other hospital -- because it hasn't joined a larger network. Johns Hopkins's Dr. Montgomery says he hopes the United Network for Organ Sharing will set up one national system, which he says he would be happy to join. But for now, Johns Hopkins is more or less going on its own.

Robyn Brandon, an outgoing African-American woman from Clinton, Md., who is on medical leave from her job as a computer programmer for the government, has struggled with illnesses much of her adult life. When doctors said she needed a kidney transplant, her husband, Alan, stepped forward.

A decade earlier, his 55-year-old mother died of kidney disease, turning aside offers of a kidney from her children. "I didn't have a chance to give my mother one," says the burly, six-foot-two Mr. Brandon, who drives a mixer for a concrete company near his Maryland home. "I saw [Robyn] and thought she could wind up like Mom."

But his wife had a high level of antibodies in her blood -- the result of being exposed to many types of blood during pregnancies and blood transfusions -- meaning her body would reject most kidneys including her husband's.

Across the country in California, Mr. Barron, who has a progressive genetic disorder, suffered kidney failure, prompting doctors to put him on the transplant list. His 19-year-old daughter suggested that she or her 17-year-old brother give him one of their kidneys. But Mr. Barron was "dead set" against the idea. "This is a genetic disease and there's a 50% chance either of them could get it," he says. "I wanted them to be able to donate to each other."

His wife, Tomomi, a Tokyo native who met Mr. Barron when both worked for Sun Microsystems Inc. in Japan, also offered a kidney. But she has type A blood, while he has type B. Mr. Barron created a Web site seeking a donor and traveled to various hospitals, hoping to get on a shorter waiting list. He thought about going to China, where foreigners have been able to get transplants quickly, but his doctor talked him out of it.

In October 2006, the Barrons got a call from Johns Hopkins, which they had visited. The hospital asked if Mr. Barron wanted to take part in a five-way kidney exchange, the most ambitious ever attempted. He had to decide quickly; he'd have to be in Baltimore within three days.

Under the plan, Mr. Barron would get a kidney from a 61-year-old woman, while Mrs. Barron would donate her kidney to another patient. Thus, the kidney he would get would be 20 years older than the one his wife would give up. In addition, doctors said, an artery leading into his potential donor's kidney was beginning to show signs of disease. He decided to pass, and the five-way swap occurred last Nov. 14 without him.

An increasingly anxious Mr. Barron talked to his kidney specialist in Palo Alto. The doctor scanned his patient list and found a possible match in the area: A couple who had moved from South Korea to Silicon Valley when the husband, Younki Wyi, got a job at a software company. His wife, Jeonja Jeon, was diagnosed with kidney disease in 2003 and went on dialysis two years later.

Mr. Wyi couldn't donate one of his kidneys to his wife because they had different blood types. Ms. Jeon, who spoke almost no English, had only a few friends in the U.S., through her church. As his wife's health deteriorated, Mr. Wyi considered paired donation, which he had heard about in his home country. "Why don't we consider a solution for ourselves?" he says he told his wife. She wanted to wait for an organ from a deceased donor, but he pressed. "I told her, 'Look, you are a Christian, and how can you ask for someone to donate instead of me?' We should try to help each other."

Eventually, she changed her mind. "I prayed a lot and went to church as often as I could," she said, in an interview conducted in Korean.

Earlier this year, their doctor suggested that the Korean couple arrange a kidney exchange with the Barrons.

But before that plan could be finalized, the Barrons got a call from Johns Hopkins -- saying it had a found a match. Mrs. Barron, a healthy Japanese woman living in California, turned out to be the 1 in 500 match for Mrs. Brandon, a dangerously ill African-American living in Maryland. The Barrons agreed to do the surgery at Johns Hopkins.

Tug-of-War

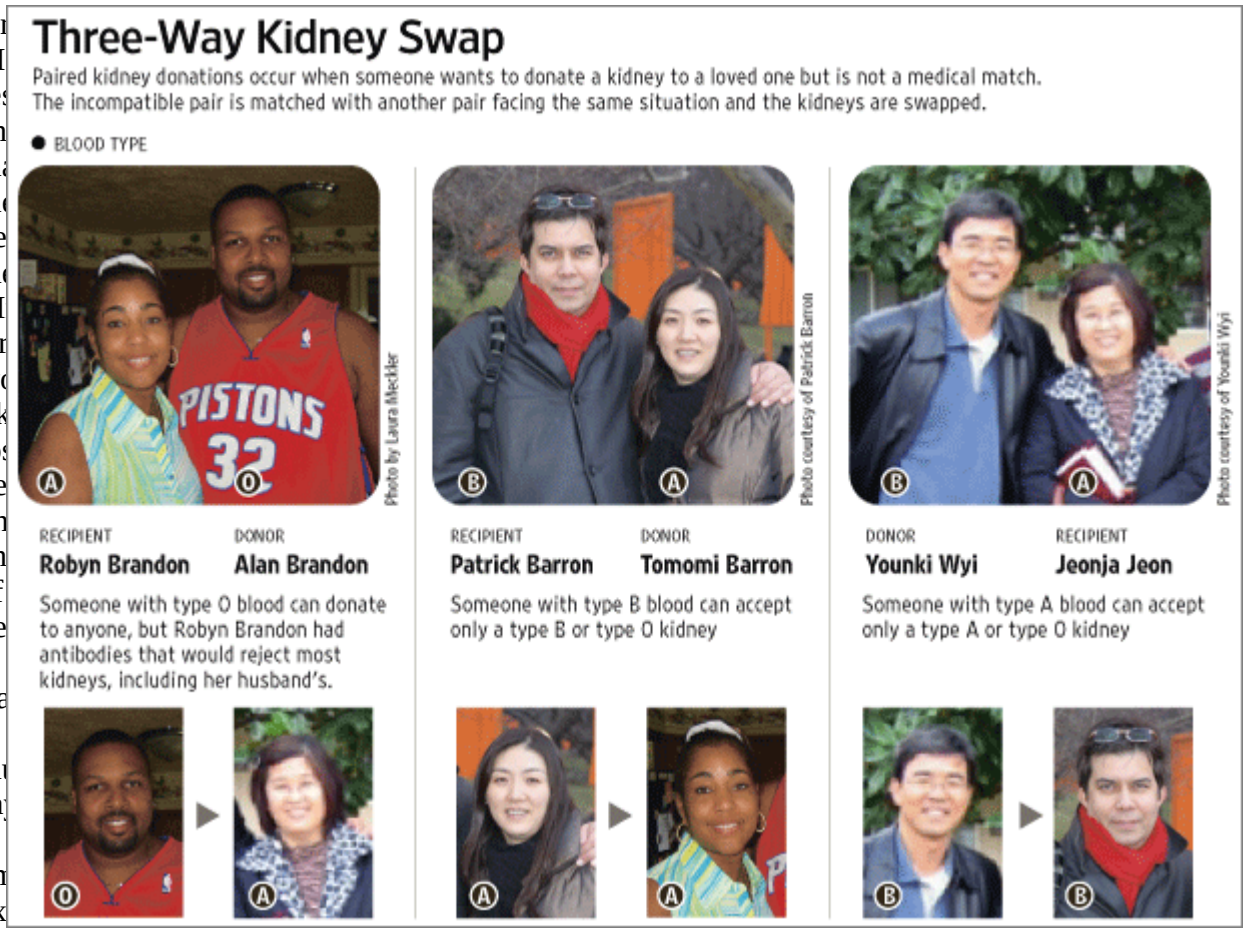
Then Steve Katznelson, medical director of California Pacific's kidney-transplant program, stepped in -- saying they were ready to do the kidney swap there, with the Korean couple. Suddenly, the Barrons found themselves in a tug-of-war between the Baltimore and San Francisco surgeons.

"I thought about things and said, 'Look, flying out to Baltimore is an added complication,' " Mr. Barron says. "From my selfish point of view, I said, 'Gee, we have a donor here for me...I want to do it here.' "

But Dr. Montgomery wasn't ready to give up, fearing he wouldn't find another rare match for his patient. So he proposed an alternative: a three-way swap. He and Mr. Brandon would fly to California and the three donor surgeries would take place there. Then he would rush Mrs. Barron's kidney back to Baltimore for Mrs. Brandon. Mrs. Barron would donate her kidney to Mrs. Brandon, Mr. Brandon would donate to Mr. Wyi's wife, and Mr. Wyi would donate to Mr. Barron.

In an email to Dr. Montgomery, Dr. Katznelson broke the news that Mr. Barron didn't want to do it, concerned that adding a third couple would complicate matters. "He has been through a lot of

near-transplant experiences. It's his choice."



disappointed in this outcome and somewhat incredulous about how it could have occurred," he wrote.

He added that the lack of cooperation between the two hospitals boded ill for creating a national program for paired donation.

But even Mrs. Brandon -- arguably the biggest beneficiary, since she was the hardest match -- had reservations. She worried about her husband flying to California for surgery and that the kidney intended for her might not survive the trip back East.

In the end, two donors broke the impasse.

Culture of Volunteering

By now, Mrs. Barron knew she was a rare match for a woman who was very sick. Feeling an obligation, she talked her husband into the three-way exchange. She had been impressed by the culture of volunteering in the U.S., she says, a contrast to her native Japan. "I felt so special because she was a difficult case to find a match for, but she finally found me," she says.

In Maryland, Mr. Brandon convinced his wife as well. "Just put it in the Lord's hands," he told her. "Let's do it."

On April 25, Mr. Brandon flew to California.

Two days later, the five patients reported to the hospital -- at specified, staggered times. Doctors don't want donors and recipients to meet, concerned it might give someone a reason to kill the deal.

At 9 a.m., the surgeries began -- at the same time, as is standard, to be sure no one backs out. A runner dashed among three operating rooms to check that everyone was ready and gave the start signal. About three hours later, the three donor kidneys were out of their original bodies and two moved to nearby rooms for transplant. Dr. Montgomery packed Mrs. Barron's kidney in a cooler equipped with a GPS tracking system that allowed the Johns Hopkins team to monitor the trip across the country online so they knew precisely when it would arrive.

After racing across the Bay Bridge in an ambulance, Dr. Montgomery flew on a chartered Lear jet to Baltimore, where a state highway-patrol helicopter ferried him to the hospital. Mrs. Brandon's 72-year-old mother, who was in the Hopkins waiting room, heard the helicopter and saw Dr. Montgomery burst through the doors. Her daughter was in the operating room, already under anesthesia.

After the surgery, Mr. Brandon called his wife at Johns Hopkins to see how she was doing. "Both of us were groggy," says Mrs. Brandon. "But I had to hear his voice, and he had to hear my voice."

Mr. Brandon handed the phone to Mrs. Barron, the donor. In a tearful conversation, she spoke of how determined she had been to give Mrs. Brandon her kidney.

Mrs. Brandon repeated the thanks she had written in a note that her husband delivered. "To the person that gave me another chance at life," it said. "Thank you a thousand times. No words can express the joy I feel. Thank you. Your kidney recipient, Robyn."

--Gina Chon contributed to this article.

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