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Health

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A larger, more efficient system for matching kidney donors with recipients would save hundreds of lives and hundreds of millions of dollars every year, according to a new study by researchers at the Johns Hopkins Hospital and the Massachusetts Institute of Technology.

Their paper, published this week in the *Journal of the American Medical Association*, looked at paired donation, a relatively new transplant method that has grown more popular in recent years.

Here's how it works: For a kidney transplant to be successful, the donor and recipient must be medically compatible. Some patients have willing donors whose tissues aren't compatible with their own. The exchange system finds another pair of incompatible donors. The donor in the first pair gives a kidney to the recipient in the second pair, and vice versa.

Over the past decade, there have been more than 50 paired donations in the United States, 22 of them at the Johns Hopkins Hospital, which has become a leader in the procedure.

Many transplant specialists have argued that increased use of paired donation could help a significant percentage of the 61,000 patients waiting for a kidney transplant. Although several regional networks are being set up to match pairs, there is no national system.

Last year, Dr. Dorry Segev, a Johns Hopkins Hospital transplant surgeon, and his wife, Sommer

[*See Transplants, 6E*]

Researchers look at paired donation for more efficient kidney transplants

Transplants, from Page 1E]

Gentry, a mathematics grad-uate student at MIT, decided to analyze the effect of a national paired donor program.

"We thought 'What if we had a system that was available to everyone in the U.S.?'" said Gen-try, who is working on her Ph.D. thesis.

The couple came up with the system for matching donor-recipient pairs. Using simulated pools of donors and recipients, they found that a national system using their matching method would produce thousands of matches, and would do so more efficiently than current methods.

They say that their approach would match almost 48 percent of the pairs, a 14 percent improvement over the system used by several paired donor programs around the country.

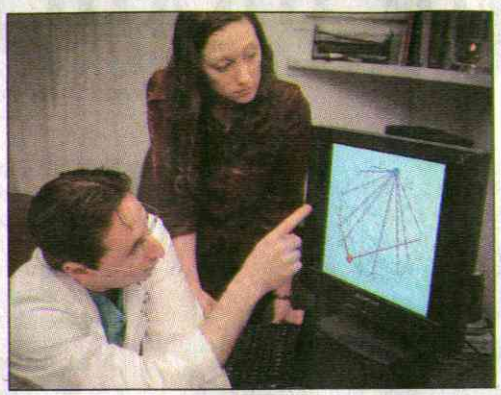
"We suspect there are thousands of patients who can benefit from this," says Segev. Although the paper didn't address the question directly, Segev estimated that the system could save several hundred lives annually.

Every year, about 6 percent of those on the waiting list for a kidney die before one can be found.

Segev and Gentry calculate that if 4,000 people joined the matched pairing network, and about half received kidneys, the program would save $750 million a year — primarily from decreased use of dialysis, an expensive medical procedure that purifies the blood of patients with kidney failure.

"It's great to model this ... but you've got to go out and get the real numbers."

Dr. Steve Woodle, transplant surgeon



GENE SWEENEY JR. : SUN STAFF

Dr. Dorry Segev and his wife, Sommer Gentry, have developed a plan for paired kidney donations.

Segev and Gentry say that to work best, the system must be national in scope and make matches carefully. "One strategically wrong match can result in many lost opportunities for other patients," says Segev.

Choosing multiple paired matches is a complex process. Transplant specialists must take into account not only immune system compatibility — which is determined by about 100 different kinds of immune cells — but also blood type and the age of the donors.

For example, people with Type O blood can only receive kidneys from other Type O's. But those with Type A blood can receive kidneys from A's and O's. The same holds true for Type B. To maximize the number of matches, Type A and Type B donors should be matched with A and B recipients, leaving O donors for O recipients.

Kidney transplant specialists liked the proposal, but said it left out key variables.

"It's a great idea, but it's not perfect," said Dr. Michael Rees, a transplant surgeon at the Medical College of Ohio in Toledo. "This paper is all kind of an educated guess. It's not a fact paper."

Rees is part of the Ohio Solid Organ Transplant Consortium, a group of nine transplant centers in the Midwest that are working to increase paired donations. The group has created its own matching software, and is working with 29 states to enlarge the network of paired donors and recipients.

Rees said the researchers focused too much on the quantity of matches and not enough on the quality. For example, he said the authors don't take into account age disparities between donors. Such differences can be important, because kidneys from a younger person tend to last longer than those from an older person. To make an exchange as fair as possible, doctors try to match donors of similar age.

Others argue that the best way to set up a national system is to actually begin building it. Dr. Steve Woodle, a University of Cincinnati transplant surgeon, said that only through real-world experience would doctors and researchers come up with the best way to pair donors.

"It's great to model this," says Woodle, who also is involved with the consortium. "But you've got to go out and get the real numbers."