The Kidney
Connection

**DORRY SEGEV &
SOMMER GENTRY**
The couple tweaked a decades-old algorithm to develop a better way to match kidney donors and patients. Their optimized matching system could save hundreds of lives each year

Pairing came naturally to Dorry Segev, a transplant surgeon, and his wife Sommer Gentry, a mathematician. After meeting in 1999 at a swing-dance competition in Stamford, Conn., the couple became dance partners and went on to win British lindy-hop competitions before getting hitched in 2003. Last year the duo partnered to devise a system that could save hundreds of lives a year by more efficiently matching kidney donors with the 62,000-plus Americans waiting for a transplant.

More than 3,000 people die each year waiting for a kidney. Although many patients have loved ones who are willing to donate a kidney, incompatible blood types or antibodies often make the transplants impossible. As a result, most patients wait three to seven years for a kidney from a cadaver—which lasts only half as long as an organ from a live donor. To help solve this problem, Segev and Gentry devised a way to improve kidney-paired donation, which involves matching a patient who has a willing but incompatible donor with a donor-patient pair who have the same dilemma. In a swap, the donor from the first pair gives a kidney to the patient in the second pair, and the donor in the second pair gives a kidney to the patient in the first pair.

While paired donation is growing (around 25 hospitals, including Johns Hopkins, where Segev works, now use it), fewer than 100 matches have been made since 2001, in part because no national program has been put into place. That means the number of organs actually donated is less than the number being offered. "The matching programs that exist are not efficient," says Segev, whose optimized matching system, developed with Gentry, was published in the *Journal of the American Medical Association* in April. Based on an algorithm created by the Canadian mathematician Jack Edmonds in 1965, the system improves paired donation by ensuring the maximum number of matches while still factoring in age, location and willingness to travel. Segev estimates that if only 7% of kidney-transplant hopefuls participated in a national program, the health-care system would save $750 million annually, since fewer patients would spend years on dialysis waiting for that perfect match. —*By Anita Hamilton. With reporting by Matt Smith/New York*