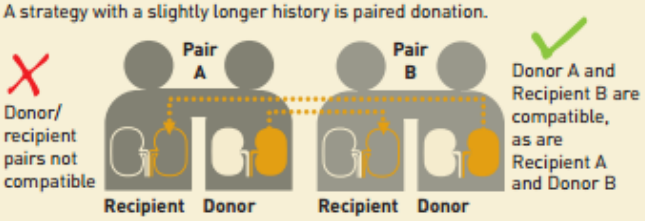
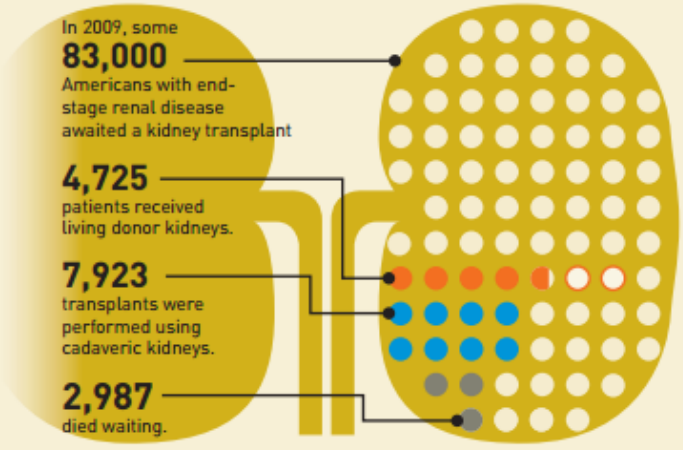
A Fair Trade: Paired Donation

A strategy with a slightly longer history is paired donation.



Surgeries are typically performed simultaneously so donors can't back out after their partners receive a kidney. As of December, 709 patients in America had received kidney transplants via paired donation.

The Grim Numbers



- One-third of patients cannot accept a kidney from a friend or family member because of blood type or immune system incompatibilities. Patients who have no compatible donor usually end up listed for a deceased donor kidney transplant—but they can also enroll in a registry for paired donation.
- Recipients of kidneys from living donors fare better than those who receive cadaveric organs—on average, a deceased donor kidney lasts only half as long. That's because a kidney from a living donor is usually transplanted right after removal; the donor is often a close relative, so there's less likelihood of rejection, and the operations can be scheduled when donor and recipient are in the best possible health.
- An additional 2,000 to 3,000 Americans could undergo transplants each year if NEAD chains were organized through a nationwide registry, estimates University of Toledo Medical Center urologist Michael Rees. This would save roughly $400 million each year in dialysis costs.

The Controversy

In a NEAD chain, if for some medical or personal reason the bridge donor fails to give a kidney, the chain will be broken. But the next donor/recipient pair can still enter into a new paired donation or chain, says Rees. But some experts contend that isn't enough. "The possibility of huge disappointment and heartache calls into question the legitimacy of this strategy," says Ron Shapiro, director of the kidney, pancreas and islet transplant program at the University of Pittsburgh Medical Center. Ethicists also are concerned about whether kidneys from altruistic donors should be allocated first to patients on the deceased donor waiting list. Rees argues that NEAD chains still benefit patients without willing donors because each subsequent transplant in the chain takes a candidate off the waiting list. Others worry that NEAD chains put too much pressure on bridge donors to risk surgery.

MILESTONE //

A Hands-On History

Fifty years ago, a landmark paper described "closed-chest massage," soon to be known as cardiopulmonary resuscitation. CPR was the culminating discovery made by a man whose perspicacity has saved countless lives. Remarkably, the individual crucial to the development of CPR, the first closed-chest defibrillator and the very knowledge that electricity can jolt a stopped heart into beating was not a physician but an electrical engineer.

William B. Kouwenhoven was already 74 years old when he told the world about CPR in a 1960 paper published in the *Journal of the American Medical Association*, but his life work began in 1928. It was then that Consolidated Edison of New York, concerned by the alarming number of linemen deaths, asked Johns Hopkins University and other research facilities to find ways to reverse the effects of accidental electrocution. The university assembled an interdisciplinary team, headed by a New York–born, German-educated "pipe-smoking, contemplative" professor of electrical engineering known "for his creative mind," as a 1998 article in *Hopkins Medical News* described Kouwenhoven.

After studying the effects of electrical shock on rats and dogs in 1933, the group reported that although an initial shock (such as electrocution) could stop a heart, a second shock administered quickly enough could restore a heartbeat. The discovery eventually led physicians to perform surgery and place electrodes directly on a patient's heart.

Yet open-heart defibrillation could hardly be performed on utility workers in the field. So the Edison Electric Institute gave scientists a grant to develop a practical technique. In 1957 Kouwenhoven's group unveiled a closed-chest defibrillator prototype weighing 200 pounds (the team would later introduce a portable, 45-pound model).

Working to perfect the defibrillator, a graduate student on Kouwenhoven's team made a curious discovery. In 1958, G. Guy Knickerbocker noticed that even before the current was turned on, the heavy electrode paddles on a dog's chest caused the animal's blood pressure to rise. When Knickerbocker pushed the paddles in a sustained rhythm, the weight of the devices caused circulation to return. This observation led Kouwenhoven, Knickerbocker and a third member of the team, cardiac surgeon James Jude, to experiment with forceful, rhythmic pressure on the chest, which created enough blood flow to sustain vital organs until the victim could be transported to a hospital.

Following hundreds of experiments on dogs, the team applied CPR to 20 patients, reporting in *JAMA* "an overall permanent survival rate of 70%." The beauty of CPR was that medical training and equipment were not needed—medical emergency personnel as well as laypeople could easily learn and apply the technique. "Anyone, anywhere, can now initiate cardiac resuscitative procedures," the paper explained. "All that is needed are two hands." ■