

Press Release

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Embargoed Until Wednesday, March 11 at 5 p.m.

“Pay it Forward” Approach Creates Chain of Ten Kidney Transplants Highlighted in New England Journal of Medicine

A groundbreaking approach to increasing the quantity and quality of kidney transplants across the country is detailed in the March 12, 2009 edition of the *New England Journal of Medicine* (NEJM). The article titled “A Nonsimultaneous, Extended, Altruistic Donor Chain” highlights the world’s longest chain of kidney transplants made possible by maximizing the good that can come from an altruistic, or Good Samaritan, kidney donor. By passing the altruism of the first donor in the chain onto all subsequent donors, incompatible pairs no longer have to pay back the gift given to them. Instead, the barriers between donors and recipients are overcome through a chain of nonsimultaneous transplants in which participants “pay it forward” to others in need.

Lead author of the report, Dr. Michael A. Rees, professor of urology at The University of Toledo and medical director of the Alliance for Paired Donation (APD), details an approach in which, for the first time, paired donors are trusted to donate their kidney after their loved one has received their transplant.

Typical paired donations occur when someone who needs a kidney has a loved one who is willing to donate one, but their body chemistry is not a good match. That willing donor and recipient are then placed in a computer registry until they can be matched with a pair in the same situation. Simultaneous kidney transplants then occur, so that neither party can harm the other by backing out of the arrangement.

The NEJM report details a twist on the paired donation – the first ever “non-simultaneous, extended, altruistic-donor” (NEAD) transplant chain in which willing donors make their donation only after their recipient has already received a transplant.

“When an altruistic donor starts a kidney donation chain it is no longer imperative that the transplants are done simultaneously,” said Dr. Rees. “If a donor along the chain fails to donate to the next recipient, the outcome will be unfair, but the waiting pair will not have been irreparably harmed and can still enter into a new paired donation or chain because the pair is still intact. “

The authors suggest that this approach may help increase the number of transplants performed. Simulations show that paired donations involving more than two pairs will yield substantially more transplants than conventional two-way exchanges and NEAD chains can overcome insurmountable logistical barriers, such as having 20 simultaneously available operating rooms to perform 10 simultaneous transplants.

Those claims are supported in the NEJM case report of 10 kidney transplants initiated in July 2007 by a single altruistic donor and coordinated over eight months by two large paired-donation registries. The transplants involved six hospitals in five states, and no one reneged on their commitment. While currently the chain stands at 10 transplants, an eleventh donor, known as a “bridge donor” now has been waiting for nearly one year for her opportunity to pay it forward and continue the chain.

The chain unfolded like this: Matt, a 28-year-old Michigan man, donated a kidney to Barb in Phoenix simply because she was in need and he wanted to help someone. A week later Barb’s husband, Ron, continued the chain by flying to The University of Toledo Medical Center and donating a kidney to Angela, a 32-year-old woman who had been on dialysis for 12 years. In turn, Angela’s mother, Laurie, donated a kidney to Cecelia in Columbus, Ohio and Cecelia’s daughter, Linda, gave a kidney to George.

Because George’s donor had a rare blood type, the APD contacted Johns Hopkins University Medical Center and partnered with its paired exchange program to make four of the 10 transplants happen. Dr. Robert Montgomery, director of the Johns Hopkins Incompatible Kidney Transplantation Program noted that: “NEAD chains are the latest of a series of important breakthroughs in transplantation that will significantly increase the number of life-savings organs available to hard-to-match patients, many of whom die while waiting years for a kidney.”

The transplants occurred at Banner Good Samaritan Hospital in Phoenix; University of Toledo Medical Center; The Ohio State University Medical Center; Johns Hopkins Hospital; Wake Forest Baptist Medical Center; and were made possible by an altruistic donor who came through Buffalo General Hospital.

Altogether, the APD has now started six NEAD chains that are responsible for 19 transplants: a 10-way chain, a 5-way chain and four 1-way chains are underway. To date, there have been 13 bridge donors and none have reneged. In the second NEAD chain, one bridge donor gave her kidney 10 months after her father received his transplant.

Several other individuals played critical roles in making this NEAD chain possible through the development of computer models and software that identify the best possible matches. Jonathan Kopke of the Department of Public Health Sciences at the University of Cincinnati created the Web version of the Alliance for Paired Donation software; Dr. Alvin Roth, professor of economics at Harvard University, helped write the “matching” algorithm used by the APD; and Tuomas Sandholm of the Computer Science Department at Carnegie Mellon University and Utku Unver of the Department of Economics at Boston College developed the process for optimizing match runs.

In addition to helping potential recipients in incompatible pairs obtain transplants, the article states NEAD chains may also make it possible for them to receive higher-quality transplants. Introduction of an altruistic donor allows greater flexibility for every donor to be matched to the recipient for whom the donor provides maximum benefit. Also, kidneys from living donors last longer on average than those from deceased donors—16.5 years versus 8.5 years.

NEAD chains allow altruistic donors to maximize the impact of their altruism. The potential for helping many patients instead of just one can serve as a strong motivation for potential altruistic donors. If an important benefit to a donor is psychological, then arguably there is more psychological benefit derived from helping a chain of many patients than from helping only one. While in 2006 there were only 68 altruistically donated kidney transplants performed in the United States, over 250 potential altruistic donors have registered through the website of the Alliance for Paired Donation.

The Alliance for Paired Donation is headquartered in Toledo, Ohio. A 501 (c) 3 organization, the mission of the APD is to save lives by significantly shortening the waiting time for kidney patients through kidney paired donation. In its first two years of operation, the APD facilitated 32 paired exchange transplants, 19 of which were the result of NEAD chains. Six chains are now underway and the seventh chain is slated to begin in late March.

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Learn more about the Alliance for Paired Donation by visiting www.paireddonation.org or by calling 419-866-5505.

Interviews with Dr. Michael Rees, founder and medical director, can be arranged by calling 419-866-5505.