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## After Years of Growth, Fewer Transplants Done through ‘Kidney Chains’



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### An extra 1,000 transplants could be done every year, Johns Hopkins study suggest.

An additional 1,000 patients could undergo kidney transplants in the United States annually if hospitals performed more transplants using paired kidney exchanges, new Johns Hopkins research suggests.

Also known as kidney chains, paired kidney exchanges, which allow incompatible donors to give a kidney on a loved one's behalf and ensure that loved one gets a compatible kidney from a third party - usually a stranger - in return, have become much more common since 1999 when The Johns Hopkins Hospital pioneered the practice. But the dramatic growth in the use of these exchanges - from 93 transplants in 2006 to 553 in 2010 - has now stalled, primarily because of financial barriers related to logistics, administrative costs and insurance coverage for donors, researchers say.

A report on the research appears online in the *American Journal of Transplantation*.

"There are more than 100,000 people waiting for a kidney transplant in the United States. For the one-third of patients who manage to find a living donor but learn they are the wrong blood type or are otherwise incompatible, kidney exchanges offer a very high rate of successful transplantation," says study leader Dorry L. Segev, M.D., Ph.D., an associate professor of surgery and epidemiology at the Johns Hopkins University School of Medicine. "But many transplant centers have not found a way to make this possible for their patients."

The success of kidney chains depends on the best possible matches, and these depend in turn on the largest possible pool of transplant candidates and their incompatible donors. With more centers participating, Segev says, more matches can be found and more transplants can be done.

The researchers found that between January 2009 and December 2011, while 161 transplant centers (77 percent of the 207 in the United States) performed at least one transplant through a kidney exchange, most were performing fewer than would be expected. In fact, more than 50 percent of all exchanges and chains were concentrated in only 22 centers. The largest number performed at a single center was 137. "If every center performed exchanges at the same rate as the top centers, an additional 1,099 transplants could take place annually," says Allan B. Massie, Ph.D., one of the researchers involved in the study.

The biggest barrier to increased paired exchange and chain transplants, Segev says, is that there is no consistent or reliable entity, either within or outside institutions, paying the extra expenses associated with kidney exchanges, which require personnel and time spent making matches, coordinating logistics among various centers, and quickly shipping organs across town or across the country, to wherever the patient in need is located. In addition, there is no standard way for insurance companies to determine which company pays for which donor's surgery.

Segev notes that some centers regularly perform two- and three-way transplants. In 2009, Johns Hopkins performed an eight-way, multi-hospital kidney transplant, which involved an altruistic donor and seven pairs of people -- each made up of one person in need of a kidney and one willing but incompatible donor.

"At this point, every center in the country has the logistical and intellectual ability to do these exchanges," says Segev, director of clinical research for transplant surgery at Johns Hopkins and co-developer of one of the first computer algorithms that make exchanges possible. "Over 75 percent of centers have performed at least one kidney exchange transplant over the past three years, suggesting that most of the limitation is not a willingness to participate but rather financial and support service barriers."

Few hospitals used kidney exchanges until Johns Hopkins researchers in 2005 published a paper in the *Journal of the American Medical*

*Association* showing the extent to which patients could benefit from the procedure. Several regional databases of transplant patients and their incompatible donors have been developed in recent years, offering the potential for even more transplants if more patients and donors enter the mix.

Many patients awaiting transplants remain unaware of exchanges, Segev believes. Patients need to ask to participate. The waiting list for kidneys from deceased donors is three to five years and can be up to 10 years in some regions of the country. And 5 to 15 percent of patients on dialysis die every year waiting for a transplant. Having a kidney from a living donor means a patient can undergo transplantation without waiting in line for a deceased donor transplant.

"Kidney exchanges have done a lot of good," Segev says. "But we could do three times as much good if more centers did more of them."

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Other Johns Hopkins researchers involved in the study include Sommer E. Gentry, Ph.D., and Robert A. Montgomery, M.D., D.Phil.

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