

# Broader Adaptation of Kidney Paired Donation Could Expand Donor Pool

Those involved in paired donation must play close attention to informed consent issues.

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**K**idney paired donation (KPD) was first proposed over 20 years ago as a promising new approach to tackle organ transplantation shortages (Table 1). According to a report in the *Journal of the American Medical Association*,<sup>1</sup> formidable barriers in the form of ethical, administrative and logistical issues have kept such programs from being implemented in the United States.

In KPD transplants, incompatible donor/recipient pairs exchange kidneys so the chances of finding compatible live donor-recipient pairs is increased. Robert A. Montgomery, MD, DPhil, from the department of surgery at Johns Hopkins University School of Medicine, said that the process offers hope to patients who have compatibility issues that make it difficult for them to find suitable donors.

The two most significant barriers to greater use of live donor kidneys are blood type incompatibility and human leukocyte antigen (HLA) sensitization. Dr. Montgomery wrote that there is a 36% chance that any two individuals will be blood type incompatible. In about 30% of patients on the deceased donor waiting list, HLA sensitization is present due to exposure to foreign tissue.

## CURRENT STUDY

Dr. Montgomery and colleagues conducted a study to determine the feasibility and effectiveness of KPD for the management of patients with incompatible donors.

The study evaluated a prospective series of paired donations matched and transplanted from a pool of blood type or crossmatch incompatible donors and recipients with end-

TABLE 1. KIDNEY TRANSPLANTS

In 2004, there were 12,974 kidney donors; 6,325 were deceased organ donors and 6,649 were living organ donors.

As of October 28, there were 63,856 candidates on the kidney transplant waiting list, according to the Organ Procurement and Transplantation Network.

Source: [www.unos.org](http://www.unos.org) and [www.optn.org](http://www.optn.org)

stage renal disease. For a list of other kidney diagnoses that may lead to kidney transplants, see Table 2. The patients were from a single institution with expertise in performing transplants in patients with high immunologic risk, the authors wrote.

The series included 22 patients involved in 10 live KPD transplants. "The KPD transplant represents a cost savings compared with desensitization, which in its own right is significantly less costly than if an individual continues to undergo dialysis," he said.

## OUTCOMES

At a median of 13 months follow-up, all patients were alive and the graft survival rate was 95.5%. According to the report, 21 of the 22 patients had functioning grafts with a median 6-month serum creatinine level of 1.2 mg/dL. There were no instances of antibody-mediated rejection despite the inclusion of five patients who were highly sensitized to

**TABLE 2. KIDNEY DIAGNOSES THAT CAN LEAD TO KIDNEY TRANSPLANTS****GLOMERULAR DISEASES**

- Anti-GBM, Chronic Glomerulonephritis: Unspecified, Chronic Glomerulosclerosis: Unspecified
- Focal Glomerulosclerosis, Idio/Post-Inf Crescentic Glomerulonephritis, IgA Nephropathy
- Hemolytic Uremic Syndrome, Membranous Glomerulonephritis, Mesangio-Capillary 1 Glomerulonephritis, Mesangio-Capillary 2 Glomerulonephritis, Systemic Lupus Erythematosus, Alport's Syndrome, Amyloidosis, Membranous Nephropathy, Goodpasture's Syndrome, Henoch-Schoenlein Purpura, Sickle Cell Anemia, Wegeners Granulomatosis

**DIABETES**

- Type I Insulin Dependant/Juvenile Onset; Type II Insulin Dependant/Adult Onset
- Type I Non-insulin Dependant/Juvenile Onset; Type II Non-insulin Dependant/Adult Onset

**POLYCYSTIC KIDNEYS****HYPERTENSIVE NEPHROSCLEROSIS****RENOVASCULAR AND OTHER VASCULAR DISEASES**

- Chronic Nephrosclerosis: Unspecified, Malignant Hypertension, Polyarteritis, Progressive Systemic Sclerosis,
- Renal Artery Thrombosis, Scleroderma

**CONGENITAL, RARE FAMILIAL AND METABOLIC DISORDERS**

- Congenital Obstructive Uropathy, Cystinosis, Fabry's Disease, Hypoplasia/Dysplasia/Dysgenesis/Agensis
- Medullary Cystic Disease, Nephrophthisis, Prune Belly Syndrome

**TUBULAR AND INTERSTITIAL DISEASES**

- Acquired Obstructive Nephropathy, Analgesic Nephropathy, Antibiotic-induced Nephritis
- Cancer Chemotherapy-Induced Nephritis, Chronic Pyelonephritis/Reflex Nephropathy
- Gout, Nephritis, Nephrolithiasis, Oxalate Nephropathy, Radiation Nephritis, Acute Tubular Necrosis, Cortical Necrosis, Cyclosporin Nephrotoxicity, Heroin Nephrotoxicity, Sarcoidosis, Urolithiasis

Source: [www.unos.org](http://www.unos.org) and [www.optn.org](http://www.optn.org)

HLA. Four patients (18%) developed acute cellular rejection.

The results of this study compare favorably with the 2001 United Network for Organ Sharing live donor 1-year adjusted patient and graft survival of 98.3% and 94.3%, the investigators wrote. "For unconventional KPD transplants in which the average [panel reactive antibody] was higher than 50%, our graft survival was 100% compared with US Organ Procurement and Transplantation Network and the Scientific Registry of Transplant Recipients 2004 rate of 92% for patients with similar levels of sensitization.

While KPD is logistically challenging, Dr. Montgomery wrote that a broader implementation of the protocol on a regional or national scale could provide compatible organs for a substantial number of the estimated 6,000 patients on the waiting list who currently have incompatible donors.

**DECREASED WAIT TIMES AND COST**

"This study demonstrates that KPD transplants can be performed with outcomes similar to that of compatible living donor kidney transplants. The cost savings and decrease in waiting time that could be realized by a wider application

of this concept are substantial," Dr. Montgomery and colleagues wrote.

In an accompanying editorial,<sup>2</sup> Arthur Mata, MD, and David Sutherland, MD, PhD, of the University of Minnesota said that the difficulty of finding compatible donors is a central problem in kidney transplantation. They noted that paired donation is an exciting advance that could have some beneficial effects on the long waiting lists for transplants, but it raises ethical issues, including equity and informed consent.

For example, they asked, "What if one kidney fails early but the other functions well?" Those involved in paired donation must play close attention to informed consent issues, and also should be following donors to see what effect the transplant has, they wrote. ■

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1. Montgomery RA, Zachary AA, Ratner LE, et al. Clinical results from transplanting incompatible live kidney donor/recipient. *JAMA*. 2005;294:1655-1663.

2. Mata A, Sutherland D. Editorial comment. *JAMA*. 2005;294:1691.