

Renal Transplantation Fact Sheet

Kidney transplantation is the preferred treatment for kidney disease, but it is not a cure. For many patients, kidney transplantation provides more independence and allows them to return to normal life activities. Patients should not only understand the benefits and risks of transplantation, but also the responsibilities that follow transplantation related to clinical monitoring, medications, and financial issues. Understanding the reality of transplantation will help patients develop realistic expectations. The following is basic information about the transplantation process patients should consider carefully before embarking on a transplant evaluation.

Benefits vs. Risks of Kidney Transplant

Many patients benefit from a kidney transplant, but some do not. Nephrologists, transplant nurses, social workers, surgeons, and other team members at the transplant center will help patients understand the risks and benefits (see Table 1).

Transplant Evaluation/Candidacy

Transplant centers have individual differences, but most centers do not offer kidney transplantation to patients with the following health problems:

- Active cancer.
- Active infection.
- Untreatable heart or blood vessel disease.
- Severe blood-clotting disorders.

- Current alcohol or drug abuse.
- Severe lung disease.

These conditions put patients at risk for severe complications during or following transplantation. Other conditions that place patients at high risk for problems after transplant include obesity, not taking medications as prescribed, smoking, major depressive or other psychiatric disorders, and poor family or other social support (Danovitch, 2017).

Common tests required for transplant evaluation include, but are not limited to: blood chemistries, CBC, coagulation profile, liver function tests, urinalysis, urine culture, and several tests for infectious diseases (i.e. hepatitis B, hepatitis C, HIV/AIDS, cytomegalovirus (CMV), Epstein-Barr virus (EBV), varicella, rapid plasma reagin (RPR)). In addition, there are also several diagnostic tests done such as renal ultrasound, chest X-ray, CT scan of iliac vessels, cardiac testing, pap smear, mammogram, and colonoscopy. Some patients may require additional testing/consultations based on their co-morbidities (Woodard & Arnold, 2017).

Kidney transplantation is an elective procedure — not an emergency or lifesaving. Therefore, patients should be in the best possible condition prior to transplantation. Patients who are on the waiting list should consistently follow their prescribed treatment regimen and report major illnesses or hospitalizations as well as any address and/or phone number changes to the transplant center.

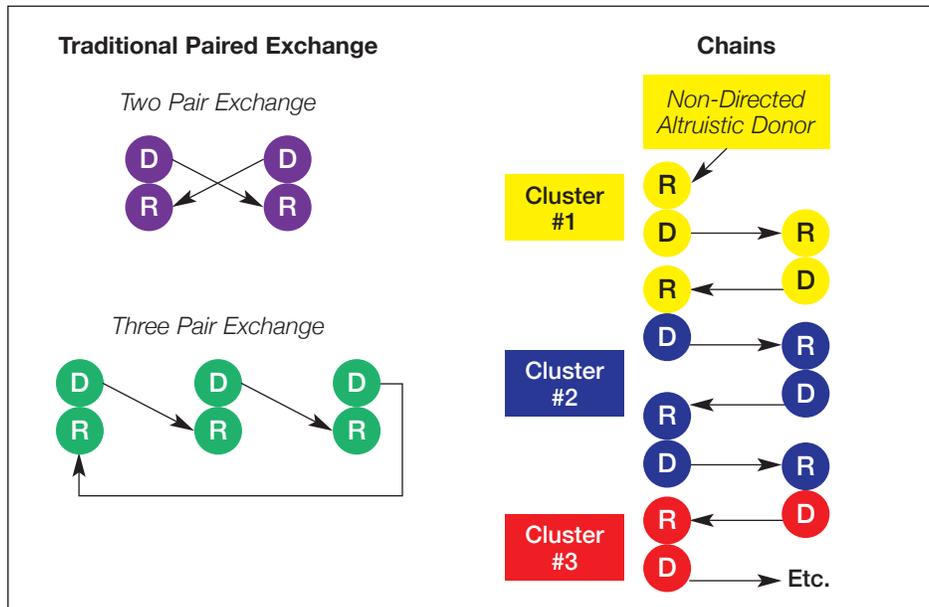
Table 1.
Kidney Transplant Benefits and Risks

Benefits	Risks
Increased energy, less fatigue	Risks associated with anesthesia
Decreased mortality	Surgical complications (i.e. bleeding)
No need for dialysis	Increased risk of infection
Ability to return to work if unable to before	Lifelong medication regimen
Minimized dietary restrictions	Anxiety, sadness, depression
	Rejection of the new kidney
	Death

Source: Woodard & Arnold, 2017.

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Figure 1.
Understanding Paired Donor Exchanges/Donor Chains



Living vs. Deceased Donor Kidneys

Transplanted kidneys come from either live donors or the deceased donor waiting list. Live donors may be related or unrelated, and each transplant center has a process for live donor selection and evaluation in accordance with national regulations. Living donation is encouraged and there are innovative systems to increase this organ pool such as paired donor exchanges and donor chains (see Figure 1). Patients should speak to their transplant center about live kidney donation and what options are available at that specific center.

Deceased donor kidneys are those from donors after death. All transplant centers are under the same regulations for how deceased donor kidneys are offered to potential kidney recipients on the waiting list. The allocation process considers both recipient factors (recipient age, diabetic status, time on dialysis) and donor factors (age of donor, cause of death, lab values, medical history). The kidneys are placed based on all of these factors. This allocation process can also be explained in more detail to the patient by the transplant team (Organ Procurement and Transplantation Network, 2021).

Transplant centers will also consider kidneys from deceased donors that are older, are from donors with increased social risk behaviors, and/or are hepatitis B or hepatitis C positive. In certain scenarios, these kidneys are viable and able to be transplanted successfully.

Post-Transplantation

Patients who have received a kidney transplant have to take anti-rejection (or immunosuppressive) medications every day for the life of the kidney. These medications have side effects that may affect one's quality of life, but they are essential to maintain the transplanted organ. Patients should talk with the transplant team and have a good understanding of these medications before being listed for a transplant.

Anti-rejection medications are very expensive. Medicare will pay part of the cost, but not the whole cost, and — under certain circumstances — only for three years. Private insurance will often cover these medications, but many will require a co-pay by the patient. Medicaid is also a means of obtaining medication coverage, but patients must qualify for Medicaid. Prior to transplantation, patients should have a clear understanding of how they will pay for their medications. Obtaining insurance and medications is the responsibility of the patient, not the healthcare team.

Patients who have received a kidney transplant are followed closely by the transplant team and have frequent laboratory tests in the first year after transplant, and — in some cases — monthly for the life of the kidney. Patients must have reliable transportation to the transplant center and to their local physician on a regular basis, adequate social support, and a telephone or other means of communication.

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Table 2.
Classifications and Side Effects of Immunosuppressive Agents

Classification	Agent	Common Side Effects
Anti-Inflammatory	Prednisone, Methylprednisolone (Solumedrol®)	Altered fat deposition, cataracts, glaucoma, diabetes, hypertension, fluid retention, bone and muscle wasting, joint disease
Anti-Proliferative	Azathioprine (Imuran®), Mycophenolate Mofetil (CellCept®), Mycophenolic Acid (Myfortic®)	Neutropenia, thrombocytopenia Mycophenolate: diarrhea, GI intolerance, teratogenic
Calcineurin Inhibitors	Cyclosporine Modified (Neoral®), Cyclosporine Non-Modified (Sandimmune®), Tacrolimus capsules (Prograf®), Tacrolimus Extended Release capsules (Astagraf XL®), Tacrolimus Extended Release tablets (Envarsus XR®)	Nephrotoxicity, diabetes, hypertension, hyperkalemia, tremors, neuropathies Cyclosporine Modified: Hirsutism, gingival hyperplasia
Antibody Induction Agents	Polyclonal Antibody Therapy: Anti-thymocyte globulin (Thymoglobulin®) Monoclonal Antibody Therapy: Basiliximab (Simulect®), Alemtuzumab (Campath®)	Neutropenia, thrombocytopenia, bone marrow suppression
mTOR Inhibitor (Mammalian Target of Rapamycin)	Sirolimus (Rapamune®), Everolimus (Zortress®)	Hyperlipidemia, diarrhea, bone marrow suppression, delayed wound healing, mouth ulcers, proteinuria
T-Cell Costimulation Blocker	Belatacept (Nulojix®)	Infusion related reactions, anemia, post-transplant lymphoproliferative disease (PTLD) and other malignancies, progressive multifocal leukoencephalopathy (PML), rare

Source: Danovitch, 2017; Colaneri et al., 2015.

Immunosuppressive Agents

Each transplant center has a protocol for induction, maintenance, and tapering of immunosuppressive agents. Table 2 outlines the most common anti-rejection agents and their side effect profiles.

Transplantation: The Nurse's Role

Nephrology nurses who work in subspecialties other than transplantation are in the unique position of having frequent contact with patients who may have an interest in renal transplantation. While nurses who work in transplantation provide much of the transplant-related education, patients benefit greatly from regular discussions that may answer questions or clarify certain points. Nephrology nurses work across the spectrum of kidney disease in a variety of positions and settings: advanced practice providers, registered nurses, inpatient, outpatient, chronic kidney disease clinics, and dialysis units. This gives them an opportunity to reinforce information

related to transplantation and support their patients throughout the transplant process. Nephrology nurses serve as a vital link between the patient and the transplant center, and their collaborative efforts are essential to a successful outcome (Gomez, 2011).

Information regarding kidney transplantation may be obtained through your local transplant centers, the United Network for Organ Sharing (UNOS), or the regional End Stage Renal Disease (ESRD) Network offices.

Resources

- Colaneri, J., Neyhart, C., & Carlson, L. (2015). Transplantation. In C.S. Counts (Ed.), *Core Curriculum for Nephrology Nursing* (6th ed.). American nephrology Nurses Association.
- Danovitch, G.M. (2017). *Handbook of kidney transplantation* (6th ed.). Lippincott Williams & Wilkins.
- Gomez, N.J. (Ed.). (2011). *Nephrology nursing scope and standards of practice* (7th ed.). American Nephrology Nurses Association.

Organ Procurement and Transplantation Network. (2021). *Organ procurement and transplantation network (OPTN) policies*. https://optn.transplant.hrsa.gov/media/1200/optn_policies.pdf

Woodard, A., & Arnold, E. (2017). Kidney Transplantation: Organ Donation. In S.M. Bodin (Ed.), *Contemporary Nephrology Nursing* (3rd ed., pp. 713-721). American Nephrology Nurses Association.

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