Kidney Transplant

Description

A kidney transplant involves the surgical removal of a kidney from a cadaver, living-related, or living-unrelated donor and transplantation into the recipient.

Background

Based on data from the Organ Procurement and Transplantation Network (OPTN) in 2013, about 40% of kidney transplants in the U.S. (5734 of 13,280) were performed using organs from living donors. (1) As of April 2015, the 5-year survival rate for kidney transplants performed between 1997 and 2000 was 66.6% for organs from deceased donors and 79.8% for organs from living donors.

Combined kidney pancreas transplant and management of acute rejection of kidney transplant using either intravenous immunoglobulin (IVIg) or plasmapheresis are discussed in separate policies.

Related Policies

7.03.02 Allogeneic Pancreas Transplant
8.02.02 Plasma Exchange

Policy

*This policy statement applies to clinical review performed for pre-service (Prior Approval, Precertification, Advanced Benefit Determination, etc.) and/or post-service claims.

Kidney transplants with either a living or cadaver donor may be considered medically necessary for carefully selected candidates with end-stage renal disease.

Kidney retransplant after a failed primary kidney transplant may be considered medically necessary in patients who meet criteria for kidney transplantation.

Kidney transplant is considered not medically necessary in all other situations.
Policy Guidelines

Etiologies of end-stage renal disease include, but are not limited to, any of the following conditions associated with end-stage renal disease:

- Obstructive uropathy
- Systemic lupus erythematosus
- Polyarteritis
- Wegener’s granulomatosis
- Cortical necrosis
- Henoch-Schönlein purpura
- Hemolytic uremic syndrome
- Acute tubular necrosis
- Hypertensive nephrosclerosis
- Renal artery or vein occlusion
- Chronic pyelonephritis
- IGA nephropathy
- Anti-glomerular base-membrane disease
- Focal glomerulosclerosis
- Analgesic nephropathy/ with medullary necrosis
- Heavy metal poisoning
- Glomerulonephritis
- Polycystic kidney disease
- Medullary cystic disease
- Nephritis
- Nephrocalcinosis
- Gout nephritis
- Amyloid disease
- Fabry’s disease
- Cystinosis
- Oxalosis
- Diabetes mellitus
- Horseshoe kidney
- Renal aplasia or hypoplasia
- Wilms’ tumor
- Renal cell carcinoma
- Multiple myeloma in remission
Potential contraindications to solid organ transplant (subject to the judgment of the transplant center):

1. Known current malignancy, including metastatic cancer
2. Recent malignancy with high risk of recurrence
3. History of cancer with a moderate risk of recurrence;
4. Systemic disease that could be exacerbated by immunosuppression;
5. Untreated systemic infection making immunosuppression unsafe, including chronic infection
6. Other irreversible end-stage disease not attributed to kidney disease
7. Psychosocial conditions or chemical dependence affecting the ability to adhere to therapy

The OPTN policy 15.2 permits HIV test positive individuals as organ candidates if permitted by the transplant hospital. Care of HIV test positive organ candidate and recipients should not deviate from general medical practice. (2)

Indications for renal transplant include a creatinine level of greater than 8 mg/dL, or greater than 6 mg/dL in symptomatic diabetic patients. However, consideration for listing for renal transplant may start well before the creatinine level reaches this point, based on the anticipated time that a patient may spend on the waiting list.

Rationale

Organ donation

Kidney transplant is an accepted treatment of end-stage renal (ESRD) disease that results from a variety of etiologies, most commonly diabetic nephropathy. An insufficient supply of donor organs continues to be a challenge. A 2012 review article by Schold and Segev focused on strategies to increase the pool of organs available for kidney transplantation from deceased donors. (3) Interventions discussed included an “opt-out” policy in which individuals are presumed to give consent to organ donation unless they specify non-consent, expanded use of donors such as commercial sex workers who are considered to be at increased risk of disease transmission by using rigorous screening and expanded use of donors with documented infections in selected situations eg transplantation of organs from HIV-positive donors to HIV-positive recipients.

Living donors

Several papers have reported on long-term outcomes in live kidney donors. The most appropriate control group to evaluate whether donors have increased risks of morbidity and mortality are persons who meet the criteria for kidney donation but who did not undergo the procedure. Studies of this type have had mixed findings. For example, Segev et al did not find that donors had an increased mortality risk (4). The authors analyzed data from a national registry of 80,347 live donors in the U.S who donated organs between April 1, 1994 and March 31, 2009 and compared them with data from 9364
participants of the National Health and Nutrition Examination Survey (NHANES) (excluding those with contraindications to kidney donation). There were 25 deaths within 90 days of live kidney donation during the study period. Surgical mortality from live kidney donation was 3.1 per 10,000 donors (95% confidence interval [CI], 2.0 to 4.6) and did not change over time, despite differences in practice and selection. Long-term risk of death was no higher for live donors than for age- and comorbidity-matched NHANES III participants for all patients and also stratified by age, sex, and race.

Mjoen et al in Norway found that kidney donors are at increased risk of long-term mortality. (5) The investigators identified 1901 kidney donors and compared them with a control group of 32,621 potentially eligible people who had participated in a population-based survey. The kidney transplants occurred between 1963 and 2007 and the median follow-up was 24.9 years. There were 224 (12%) deaths among kidney donors during the study period and 2425 (7%) deaths among controls. The unadjusted hazard ratio (HR) for death by any cause in kidney donors compared with controls was 2.49 (95% CI, 2.13 to 2.91; p<0.001). After adjusting for potential confounding variables, risk of mortality remained elevated among donors (HR=1.48; 95% CI, 1.17 to 1.88; p<0.001).

Potential contraindications to kidney transplant

**HIV infection**

In 2001, the Clinical Practice Committee of the American Society of Transplantation (ATS) proposed that HIV-positive patients who meet the following criteria, could be considered candidates for kidney transplantation. (6) (These criteria may be extrapolated to other organs.)

- CD4 count >200 cells per cubic millimeter for >6 months
- HIV-1 RNA undetectable
- On stable anti-retroviral therapy >3 months
- No other complications from AIDS (eg, opportunistic infection, including aspergillus, tuberculosis, coccidiosis mycosis, resistant fungal infections, Kaposi's sarcoma, or other neoplasm).
- Meeting all other criteria for transplantation.

A 2011 review article by European authors stated that there are adequate data suggesting that renal transplantation in adequately selected HIV-positive patients is safe in the short- and medium-term and that patient and graft survival rates are similar to those in HIV-negative patients. (7) Moreover, data do not suggest that immunosuppressive therapy has a negative impact on the course of HIV infection. However, rates of acute rejection after kidney transplantation are higher in HIV-positive patients. In addition, little is known about the management of co-infection with hepatitis C or about the optimal antiretroviral and immunosuppressive regimens. The authors concluded that more studies are needed to address these issues as well as long-term outcomes.

Several studies have evaluated outcomes of kidney transplantation in HIV-positive patients. In 2015 Locke et al examined outcomes in 499 HIV-positive kidney transplant recipients identified in the Scientific Registry of Transplant Recipients (SRTR). (8) Compared with early era transplants (2004-2007), patients transplanted in the modern era (2008-2011) had a significantly lower risk of death (HR=0.59, 95% CI, 0.39 to 0.90). Five-year patient survival was 78.2% for patients transplanted in the
early era and 85.8% for modern era transplants. In another article, Locke et al compared outcomes in 467 adult kidney transplant recipients and 4670 HIV-negative controls, matched on demographic characteristics. (9) Compared with HIV-negative controls, survival among HIV-positive transplant recipients was similar at 5 years posttransplant (83.5% vs 86.2%, p=0.06). At 10 years, HIV-positive transplant recipients had a significantly lower survival rate than HIV-negative patients (51.6% and 72.1%, respectively, p<0.001). The lower 10-year survival rate was likely due to HIV/hepatitis C virus (HCV) coinfection; survival at 10 years in HIV-monoinfected patients and HIV-negative patients was similar (88.7% vs 89.1%, p=0.50).

**Hepatitis C infection**

A 2014 meta-analysis by Fabrizi et al identified 18 observational studies comparing kidney transplant outcomes in patients with and without HCV infection. (10) The studies included a total of 133,350 transplant recipients. In an adjusted analysis, the risk of all-cause mortality was significantly higher in HCV-positive versus HCV-negative patients (relative risk [RR], 1.85; 95% CI, 1.49 to 2.31). Risks were elevated in various study subgroups examined by the investigators. When the analysis was limited to the 4 studies from the United States, the adjusted RR was 1.29 (95% CI, 1.15 to 1.44). In an analysis of 10 studies published since 2000, RR was 1.84 (95% CI, 1.45 to 2.34). An analysis of disease specific mortality suggested that at least part of the increased risk of mortality among HCV-positive patients may be due to chronic liver disease. In a meta-analysis of 9 studies, the risk of liver disease-related mortality was highly elevated in patients infected with HCV versus uninfected patients: the (odds ratio (OR), 11.6, 95% CI, 5.54 to 24.4).

**Obesity**

In 2014, Pieloch et al published a retrospective review of data from the Organ Procurement and Transplantation Network (OPTN) database.(11) The sample included 6055 morbidly obese patients (ie, body mass index [BMI], 35-40 kg/m²) and 24,077 normal-weight patients who underwent kidney transplant between 2001 and 2006. After controlling for potentially confounding factors, the overall 3-year patient mortality did not differ significantly among obese and normal-weight patients (HR=1.03, 95% CI, 0.96 to 1.12). Similar results were found for 3-year graft failure (HR=1.04; 95% CI, 0.98 to 1.11). In subgroup analyses, obese patients who were nondialysis dependent, nondiabetic, younger, received living-donor transplants, and needed no assistance with daily living activities had significantly lower 3-year mortality rates compared with normal-weight patients who were dialysis dependent, diabetic, had poor functional status, and received a deceased-donor transplant, respectively (p<0.01). In the comparison of mortality in nondiabetic obese and normal-weight patients, the OR was 0.53 (95% CI, 0.44 to 0.63).

A 2013 study by Gill et al examined whether obese patients benefit from kidney transplantation. (12) The study compared outcomes in patients who underwent kidney transplant in the U.S. and those who were on the waiting list. In all BMI categories, risk of mortality at 1 year was significantly lower in patients who underwent transplantation than in those who remained on the waiting list. For example, among patients with a BMI of at least 40 kg/m², who received organs from donors who met standard criteria, HR was 0.52 (95% CI, 0.37% to 0.72%). Moreover, among patients with BMI 35 to 39 kg/m² who received organs from standard-criteria donors, HR was 0.34 (95% CI, 0.26 to 0.46).
These data suggest that morbid obesity is not associated with an increased risk of adverse outcomes after kidney transplant.

**Kidney Retransplant**

According to data from the OPTN, rates of 1-, 3- and 5-year survival are similar after a primary kidney transplant and a repeat transplant. (13) For example, for transplants performed between 2002 and 2004, the 1-year survival rate was 91.9% (91.6 to 92.1%) after primary transplantation and 89.7% (88.8 to 9.05%) after repeat transplantation. Among patients undergoing transplantation between 1997 and 2000, the 5-year survival rate was 72.0% (71.6% to 72.5%) after primary kidney transplantation and 66.9% (65.6% to 68.1%) after repeat kidney transplantation.

In 2015, Gupta et al reported on a retrospective analysis of OPTN data, focusing on patients who had an initial kidney transplant as children. (14) A total of 2281 patients were identified who had their first transplant when they were younger than 18 years and a second kidney transplant at any age. In multivariate analysis, length of first graft survival and age at second graft were significantly associated with second graft survival. Specifically, first graft survival time of more than 5 years was associated with better second graft survival. Moreover, patients who were between 15 and 20 years old at second transplant were at increased risk of second kidney graft failure compared with patients in other age groups.

In 2009, Barocci et al in Italy reported on long-term survival after kidney retransplantation. (15) There were 100 (0.8%) second transplants out of 1,302 kidney transplants performed at a single center between January 1983 and June 2007. Among the second kidney recipients, 1-, 5- and 10-year patient survival was 100%, 96%, and 92%, respectively. Graft survival rates at 1, 5 and 10 years were 85%, 72% and 53%, respectively.

**Practice Guidelines and Position Statements**

In 2014, the British Transplantation Society published a guideline on the management of the failed kidney transplant. (16) Among other recommendations, the guideline stated that appropriate patients with failing kidney transplants can undergo retransplantation when the graft estimated glomerular filtration rate (eGFR) falls to 10 to 15 mL/min. In addition, the guideline included a suggestion that joint transplant or advanced kidney care be initiated at least 6 to 12 months before the expected need for dialysis or retransplantation, or when the eGFR is less than 20 mL/min. The authors noted that these recommendations were based on low-quality evidence.

In 2011, the American Society of Transplant Surgeons, American Society of Transplantation, Association of Organ Procurement Organizations, and the United Network for Organ Sharing issued a position statement recommending the modification of the National Organ Transplant Act of 1984. Their recommendation was that the potential pool of organs from HIV-infected donors be explored. With modern antiretroviral therapy, the use of these previously banned organs would open an additional pool of donors to HIV-infected recipients. The increased pool of donors has the potential to shorten waiting times for organs and decrease the number of waiting list deaths. The organs from HIV infected deceased donors would be used for transplant only with patients already infected with HIV. In 2013
the HIV Organ Policy Equity (HOPE) Act was passed allowing the use of this group of organ donors. (17)

In 2006, the British HIV Association and the British Transplantation Society Standards Committee published guidelines for kidney transplantation in patients with HIV disease. (18) The guidelines recommend that any patient with end-stage renal disease with a life expectancy of at least 5 years is considered appropriate for transplantation under the following conditions:

- CD4 >200 cells/mL for at least 6 months
- Undetectable HIV viremia (<50 HIV-1 RNA copies/mL) for at least 6 months
- Demonstrable adherence and a stable HAART [highly active antiretroviral therapy] regimen for at least 6 months
- Absence of AIDS-defining illness following successful immune reconstitution after HAART.

The document lists general and disease-specific exclusion criteria and immunosuppressant protocols. These recommendations are based on level III evidence (observational studies and case reports).

**U.S. Preventive Services Task Force Recommendations**

Not applicable

**Summary**

Kidney transplant is an accepted treatment of end-stage renal disease (ESRD) in appropriately selected patients and thus may be considered **medically necessary**. Registry and national survey data suggest that live donors of kidneys for transplantation do not have an increased risk of mortality or ESRD.

Kidney retransplantation after a failed primary transplant may be considered **medically necessary**, as national data suggest similar survival rates after initial and repeat transplants.

Kidney transplantation is **not medically necessary** in whom the procedure is expected to be futile due to comorbid disease or in whom post-transplantation care is expected to significantly worsen comorbid conditions. Case series and case-control data indicate that HIV-infection is not an absolute contraindication to kidney transplant; for patients who meet selection criteria, these studies have demonstrated patient and graft survival rates are similar to those in the general population of kidney transplant recipients.

**Medicare National Policy**

The Medicare Benefit Policy Manual includes a chapter on end-stage renal disease. (18) In a section on identifying candidates for transplantation (140.1), it states:

"After a patient is diagnosed as having ESRD, the physician should determine if the patient is suitable for transplantation. If the patient is a suitable transplant candidate, a live donor transplant is considered first because of the high success rate in comparison to a cadaveric transplant. Whether one or multiple potential donors are available, the following sections
provide a general description of the usual course of events in preparation for a live-donor transplant.”

References


**Policy History**

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<thead>
<tr>
<th>Date</th>
<th>Action</th>
<th>Reason</th>
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<tbody>
<tr>
<td>March 2012</td>
<td>New Policy</td>
<td>Policy reviewed with literature search through April 4, 2013. References 1, 3-5, 10-13 added. Statement added that kidney retransplant after a failed primary kidney transplant may be considered medically necessary.</td>
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<tr>
<td>September 2013</td>
<td>Update Policy</td>
<td>Policy updated with literature review. References 5, 10-12, and 16 added. ICD codes for covered conditions moved to Policy Guidelines section. Statement added that kidney transplant is considered not medically necessary in all other situations.</td>
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<tr>
<td>September 2014</td>
<td>Update Policy</td>
<td>Policy updated with literature review; references 7-8, 12 and 14 added. Policy statements unchanged.</td>
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<td>September 2015</td>
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**Keywords**

Kidney Transplant  
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This policy was approved by the FEP Pharmacy and Medical Policy Committee on September 18, 2015 and is effective October 15, 2015.

*Signature on file*

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