Medical Policy

Blue Cross Blue Shield Blue Care Network of Michigan

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Title: Transplant-Kidney

Description/Background

Solid organ transplantation offers a treatment option for patients with different types of end-stage organ failure that can be lifesaving or provide significant improvements to a patient's quality of life.[1,] Many advances have been made in the last several decades to reduce perioperative complications. Available data supports improvement in long-term survival as well as improved quality of life particularly for liver, kidney, pancreas, heart, and lung transplants. Allograft rejection remains a key early and late complication risk for any organ transplantation. Transplant recipients require life-long immunosuppression to prevent rejection. Patients are prioritized for transplant by mortality risk and severity of illness criteria developed by Organ Procurement and Transplantation Network (OPTN) and United Network of Organ Sharing (UNOS).

Kidney Transplant
Kidney transplants were the most common procedure with 27,332 transplants performed from both deceased and living donors in 2023. Since 1988, the cumulative number of kidney transplants is over 581,744.[3,] Of the cumulative total, approximately 67% of the kidneys came from deceased donors and 33% from living donors.

Kidney transplant, using kidneys from deceased or living donors, is an accepted treatment of end-stage renal disease (ESRD). ESRD refers to the inability of the kidneys to perform their functions (i.e., filtering wastes and excess fluids from the blood). ESRD, which is life-threatening, is also known as chronic kidney disease stage 5 and is defined as a glomerular filtration rate (GFR) less than 15 Ml/min/1.73 m^2.[4,] Patients with advanced chronic kidney disease, mainly stage 4 (GFR 15 to 29 Ml/min/1.73 m^2) and stage 5 (GFR <15 Ml/min/1.73 m^2), should be evaluated for transplant.[5,] Being on dialysis is not a requirement to be considered for kidney transplant. Severe non-compliance and substance abuse serve as contraindications to kidney transplantation but even those could be overcome with clinician support and patient motivation. All kidney transplant candidates receive organ allocation points based on waiting

time, age, donor-recipient immune system compatibility, prior living donor status, distance from donor hospital, and survival benefit.[6,7,]

Pediatric Transplant
For children two years of age and older, the severity of CKD is categorized into stages based on estimated glomerular filtration rate (GFR). End-stage kidney disease (ESKD) is categorized as stage G5 with a GFR below 15 mL/min per 1.73 m2. Children under two years of age do not fit within the above classification system, because they normally have a low GFR even when corrected for body surface area. In these patients, estimated GFR based upon serum creatinine can be compared with normative age-appropriate values to detect kidney impairment.[33]

Combined kidney and pancreas transplants and management of acute rejection of kidney transplant using either intravenous immunoglobulin or plasmapheresis are discussed in separate evidence reviews.

Kidney Rejection
Acute rejection is an immune process that begins with the recognition of the allograft as non-self and ends in graft destruction. Histological features of the allograft biopsy are currently used for the differential diagnosis of allograft dysfunction. In view of the safety and the opportunity for repetitive sampling, the development of non-invasive biomarkers of allograft status, predictors of kidney rejection, cytokine assays, and gene testing are currently being investigated.

Regulatory Status

Solid organ transplants are a surgical procedure and, as such, are not subject to regulation by the U.S. Food and Drug Administration (FDA).

The FDA regulates human cells and tissues intended for implantation, transplantation, or infusion through the Center for Biologics Evaluation and Research, under Code of Federal Regulation Title 21, parts 1270 and 1271. Solid organs used for transplantation are subject to these regulations.

Medical Policy Statement

Kidney transplantation has been established. It may be considered a useful therapeutic procedure for carefully selected individuals when criteria are met.

Inclusionary and Exclusionary Guidelines

Inclusions:
- Kidney transplants with either living or cadaver donor maybe considered established for carefully selected individuals with:
    - chronic kidney disease stage 4 **OR**
    - chronic kidney disease stage 5/end stage renal disease **OR**
    - pediatric patients whose providers have documented CKD.

- Kidney retransplant after a failed primary kidney transplant may be considered established in carefully selected individuals who meet criteria for kidney transplantation.

Exclusions:

- Kidney transplantation is considered investigational in all other situations.

The consideration for risk-reducing procedure (e.g., CABG) performed at the same time as the organ transplant is a consideration based on the medical consultation review.

Potential Contraindications for Transplant:
Note: Final individual eligibility for transplant is subject to the judgement and discretion of the requesting transplant center.

Potential contraindications represent situations where proceeding with transplant is not advisable in the context of limited organ availability. Contraindications may evolve over time as transplant experience grows in the medical community. Clinical documentation supplied to the health plan should demonstrate that attending staff at the transplant center have considered all contraindications as part of their overall evaluation of potential organ transplant recipients and have decided to proceed.

Please reference the Kidney Disease: Improving Global Outcomes (KDIGO) guidelines when making determinations about the conditions below:

- Known current malignancy including metastatic cancer;
- Recent malignancy with moderate or high risk of recurrence;
- History of cancer with a moderate risk of recurrence;
- Untreated systemic infection making immunosuppression unsafe, including chronic infection;
- Other irreversible end-stage diseases not attributed to kidney disease;
- Stable systemic disease that could be exacerbated by immunosuppression;
- Psychosocial conditions or chemical dependency affecting ability to adhere to therapy.

All transplants must be prior authorized through the Human Organ Transplant Program.

The Kidney Disease: Improving Global Outcomes (KDIGO) Clinical Practice Guideline on the Evaluation and Management of Candidates for Kidney Transplantation will be used as a reference for determining clinical suitability.

*Please note there is a policy specific to a combined heart-kidney transplantation.

CPT/HCPCS Level II Codes *(Note: The inclusion of a code in this list is not a guarantee of coverage. Please refer to the medical policy statement to determine the status of a given procedure.)*

Established codes:

50300	50320	50323	50325	50327	50328
50329	50340	50360	50365	50547	

Other codes (investigational, not medically necessary, etc.):

0088U	0355U	83520

Note: Individual policy criteria determine the coverage status of the CPT/HCPCS code(s) on this policy. Codes listed in this policy may have different coverage positions (such as established or experimental/investigational) in other medical policies.

Rationale

Evidence reviews assess the clinical evidence to determine whether the use of technology improves the net health outcome. Broadly defined, health outcomes are the length of life, quality of life, and ability to function-including benefits and harms. Every clinical condition has specific outcomes that are important to patients and managing the course of that condition. Validated outcome measures are necessary to ascertain whether a condition improves or worsens; and whether the magnitude of that change is clinically significant. The net health outcome is a balance of benefits and harms.

To assess whether the evidence is sufficient to draw conclusions about the net health outcome of technology, two domains are examined: the relevance, and quality and credibility. To be relevant, studies must represent one or more intended clinical use of the technology in the intended population and compare an effective and appropriate alternative at a comparable intensity. For some conditions, the alternative will be supportive care or surveillance. The quality and credibility of the evidence depend on study design and conduct, minimizing bias and confounding that can generate incorrect findings. The randomized controlled trial is preferred to assess efficacy; however, in some circumstances, nonrandomized studies may be adequate. Randomized controlled trials are rarely large enough or long enough to capture less common adverse events and long-term effects. Other types of studies can be used for these purposes and to assess generalizability to broader clinical populations and settings of clinical practice.

Kidney Transplantation

Clinical Context and Therapy Purpose

The purpose of a kidney transplant in individuals who have end-stage renal disease (ESRD) without contraindications to a kidney transplant is to provide a treatment option that is an alternative to or an improvement on existing therapies.

The following **PICOs** was used to select literature to inform this review.

Populations

The relevant population of interest is individuals with ESRD without contraindications to a kidney transplant. ESRD refers to the inability of the kidneys to perform their functions (i.e., filtering wastes and excess fluids from the blood). ESRD, which is life-threatening, is also known as stage 5 chronic renal failure and is defined as a glomerular filtration rate less than 15 mL/min/1.73 m^2.[4,]

Interventions

The therapy being considered is kidney transplant from a living or cadaveric donor which is provided in a hospital setting by specialized staff who are equipped to perform the surgical procedure and manage postsurgical care.

Comparators

The following therapies and practices are currently being used to make decisions about managing ESRD: medical management, including dialysis and medications to control symptoms. Dialysis is an artificial replacement for some kidney functions. Dialysis is used as a supportive measure in individuals who do not want kidney transplants or who are not transplant candidates; it can also be used as a temporary measure in patients awaiting a kidney transplant.

Outcomes

The general outcomes of interest are overall survival (OS), elimination of the need for dialysis, and treatment-related adverse events (e.g., immunosuppression, graft failure, surgical complications, infections),with follow-up ranging from 30 days post-transplantation up to 10 years or more. See the Potential Contraindications section for detailed discussion.

Review of Evidence

Systematic Reviews

Chaudhry et al (2022) published a systematic review that compared survival for waitlisted patients with kidney failure who received a transplant compared to those who remained on the transplant waitlist.[8,] A total of 48 observational studies were included in the systematic review, of which 18 studies were suitable for meta-analysis. Results demonstrated a 55% reduction in the risk of mortality in patients who received a transplant compared to those who remained on dialysis (hazard ratio [HR], 0.45; 95% confidence interval [CI], 0.39 to 0.54; p<.001).

Registry Studies

According to data analysis from the OPTN , between 2008 and 2015, the 1-year survival of patients undergoing an initial kidney transplant was 97.1 % (95% confidence interval [CI], 96.9 % to 97.2 %).[3,] Five-year survival was 86.5 % (95% CI, 86.3 % to 86.6 %).

Krishnan et al (2015) published a study of 17681 patients in a U.K. transplant database who received a kidney transplant or were on a list to receive a kidney transplant.[9] Authors found significantly higher 1- and 5-year survival rates in patients who underwent a kidney transplant than in those who remained on dialysis (exact survival rates not reported).

Transplants Stratified by Donor Source

The UNOS proposed an Expanded Criteria Donor (ECD) approach in 2002 to include brain-dead donors over 60 years or between 50 and 59 years old with 2 or more of the following criteria: serum creatinine level greater than 1.5 mg/dL, death caused by cerebrovascular accident, or history of high blood pressure.[10]

Querard et al (2016) conducted a systematic review and meta-analysis of studies comparing survival outcomes with ECD vs Standard Criteria Donor (SCD) kidney transplant recipients.[10] Reviewers identified 32 publications, 5 of which adjusted for potential confounding factors. A pooled analysis of 2 studies reporting higher rates of patient-graft failure for ECD kidney recipients found a significantly higher adjusted hazard ratio (HR) for patient-graft survival (HR=1.68; 95% CI; 1.32 to 2.12). Meta-analyses were not conducted for patient survival outcomes; however, 1 study (N =189) found a higher but nonsignificant difference in patient survival with ECD than with SCD (HR=1.97; 95% CI, 0.99 to 3.91) and another study (N =13833) found a significantly increased risk of death with ECD than with SCD (HR=1.25; 95% CI, 1.12 to 1.40).

Pestana (2017) published a retrospective, single-center analysis of kidney transplants performed between 1998 and 2015 at a hospital in Brazil.[11] Of the 11436 transplants analyzed, 31% (n=3614) were performed under SCD, while 14% (n=1618) were performed under ECD. The number of ECD recipients increased over time, from 29 transplants in 1998-2000 to 450 transplants from 2013-2014. Patient survival with ECD increased from 1998-2002 to 2011-2014 (from 79.7% to 89.2%, p<0.001); a similar increase was noted in patient survival with SCD over the same time periods (from 73.1% to 85.2%, p<0.001). The study was limited by reliance on limited registry data.

Several studies have reported long-term outcomes in live kidney donors. The most appropriate control group to evaluate whether donors have increased risks of morbidity and mortality are individuals who meet the criteria for kidney donation but who did not undergo the procedure. These types of studies have provided mixed findings. For example, Segev et al (2010) found that donors had an increased mortality risk.[12] The authors analyzed data from a national registry of 80347 live donors in the U. S. who donated organs between April 1994 and March 2009 and compared their data with data from 9364 participants of the National Health and Nutrition Examination Survey (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 donors was 3.1 per 10000 donors (95% CI, 2.0 to 4.6) and did not change over times, despite differences in practice and selection. Long-term risk of death was no higher for live donors than for age- and comorbidity-matched National Health and Nutrition Examination Survey III participants for all patients and also stratified by age, sex, and race.

Potential Contraindications to Kidney Transplant

Human Immunodeficiency Virus Infection

Patients infected with human immunodeficiency virus (HIV) may receive organs from HIV-positive donors under approved research protocols through the HIV Organ Policy Equity Act. As of November 2017, 6 hospitals performed 34 such transplants (23 kidney and 11 liver transplants), involving organs from 14 deceased donors. In a prospective, nonrandomized study, Muller et al (2015) noted that HIV-positive patients transplanted with kidneys from donors testing positive for HIV showed a 5-year survival rate of 74%.[13] Researchers noted that

the HIV infection remained well-controlled and the virus was undetectable in the blood after transplantation.

Locke et al (2015) examined outcomes in 499 HIV-positive kidney transplant recipients identified in the Scientific Registry of Transplant Recipients.[14] Compared with early era transplants (2004-2007), patients transplanted more recently (2008-2011) had a significantly lower risk of death (HR=0.59; 95% CI, 0.39 to 0.90). The 5-year patient survival rate was 78.2% for patients transplanted in the early era and 85.8% for more recent transplants. In another study, Locke et al (2015) compared outcomes in 467 adult kidney transplant recipients with 4670 HIV-negative controls, matched on demographic characteristics.[15] 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 (51.6%) than HIV-negative patients (72.1%; p<0.001). The lower 10-year survival rate was likely due to HIV and hepatitis C virus (HCV) coinfection; survival rates at 10 years in HIV-monoinfected patients and HIV-negative patients were similar (88.7% vs 89.1%, p=0.50). Locke et al (2017) found significantly lower 5-year mortality rates in HIV-infected patients with ESRD who had kidney transplants compared with continued dialysis (adjusted relative risk [RR], 0.21; 95% CI, 0.10 to 0.42; p<0.001).[16]

In addition, Sawinski et al (2015) analyzed survival outcomes in patients infected with HIV, HCV, or HIV plus HCV.[17] The analysis included 492 HIV-infected patients, 5605 HCV-infected patients, 147 coinfected patients, and 117,791 noninfected patients. In a multivariate analysis, compared with noninfected patients, HIV-infected patients did not have an increased risk of death (HR=0.90; 95% CI, 0.66 to 1.24). However, HCV infection (HR=1.44; 95% CI, 1.33 to 1.56) and HIV and HCV coinfection (HR=2.26; 95% CI, 1.45 to 3.52) were both significantly associated with an increased risk of death.

Zheng et al (2019) performed a meta-analysis of 27 cohort studies, accounting for 1670 cases, to analyze various outcomes among HIV-positive patients who underwent kidney transplantation.[18] The results revealed 97% (95% CI, 95% to 98%) survival at 1 year and 94% (95% CI, 90% to 97%) survival at 3 years. Other outcomes comprised 91% (95% CI, 88% to 94%) graft survival at 1 year, 81% (95% CI, 74% to 87%) graft survival at 3 years, 33% (95% CI, 28% to 38%) with acute rejections at 1 year, and 41% (95% CI, 34% to 50%) with infectious complications at 1 year.

Current OPTN policy permits HIV-positive transplant candidates.[7]
The British HIV Association and the British Transplantation Society (2017) updated their guidelines on kidney transplantation in patients with HIV disease.[19,] These criteria may be extrapolated to other organs:

- Adherent with treatment, particularly antiretroviral therapy
- Cluster of differentiation 4 count greater than 100 cells/mL (ideally >200 cells/mL) for at least 3 months
- Undetectable HIV viremia (<50 HIV-1 RNA copies/mL) for at least 6 months
- No opportunistic infections for at least 6 months
- No history of progressive multifocal leukoencephalopathy, chronic intestinal cryptosporidiosis, or lymphoma.

Hepatitis C Infection

A meta-analysis by Fabrizi et al (2014) identified 18 observational studies comparing kidney transplant outcomes in patients with and without HCV infection.[20] The studies included 133350 transplant recipients. In an adjusted analysis, the risk of all-cause mortality was significantly higher in HCV-positive vs HCV-negative patients (RR=1.85; 95% CI, 1.49 to 2.31). Risks were elevated in various study subgroups examined by investigators. When the analysis was limited to the 4 studies from the U. S., the adjusted RR was 1.29 (95% CI, 1.15 to 1.44). In an analysis of 10 studies published since 2000, the 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 in mortality among HCV-positive individuals must have been due to chronic liver disease. In a meta-analysis of 9 studies, the risk of liver disease-related mortality was considerably elevated in patients infected with HCV than in those uninfected (odds ratio, 11.6; 95% CI, 5.54 to 24.4).

In the analysis by Sawinski et al (2015), described above, HCV infection was associated with an increased risk of mortality in kidney transplant patients compared with noninfected patients.[17]

Obesity

Several studies have found that obese kidney transplant patients have improved outcomes compared with patients on a waiting list matched by body mass index (BMI). Study results on whether morbid obesity is associated with an increased risk of adverse events after kidney transplant are conflicting.

In an analysis of kidney transplant data from the U.K., Krishnan et al (2015) reported on BMI data were available for 13536 patients.[9] They devised several BMI categories (i.e., <18.5 kg/m^2, 18.5 to <25 kg/m^2, 25 to <30 kg/m^2, 30 to <35 kg/m^2, and 35 to <40 kg/m^2). For each BMI category, patient survival was significantly higher in those who underwent kidney transplants compared with those who remained on a waiting list. In a similar analysis of U.S. data, Gil et al (2013) noted that the risk of mortality at 1 year was significantly lower in patients who underwent transplantation than in those who remained on the waiting list for all BMI categories.[21] For example, the risk was lower for patients with a BMI of at least 40 kg/m^2 who received organs from donors who met standard criteria (HR=0.52; 95 CI, 0.37 to 0.72) and for patients with BMI 35 to 39 kg/m^2 who received organs from SCD donors (HR=0.34; 95% CI, 0.26 to 0.46).

Pieloch et al (2014) retrospectively reviewed data from the OPTN database.[22] The sample included 6055 morbidly obese patients (i.e., BMI, 35-40 kg/m^2) and 24077 normal-weight individuals who underwent kidney transplant between 2001 and 2006. After controlling for potentially confounding factors, the overall 3-year patient mortality did not differ significantly between obese and normal-weight patients (HR=1.03; 05% 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 non-dialysis-dependent, nondiabetic, younger, receiving living donor transplants, and needing no assistance with daily living activities had significantly lower 3-year mortality rates than normal-weight individuals. For example, the odds for mortality between nondiabetic obese and normal-weight patients was 0.53 (95% CI, 0.44 to 0.63).

A multivariate analysis of the effect of obesity on transplant outcomes by Kwan et al (2016) included 191091 patients from the Scientific Registry of Transplant Recipients database.[23] Covariates in the analysis included age, sex, graft type, ethnicity, diabetes,

peripheral vascular disease, dialysis time, and time period of transplantation. Multivariate regression analysis indicated that obese patients had a significantly increased risk of adverse transplant outcomes including delayed graft function, urine protein, acute rejection, and graft failure (p<0.001 for all outcomes). The risk of adverse outcomes of obesity increased with increasing BMI (e.g., see Table 1), and was independent of the effect of diabetes.

Table 1. Hazard Ratio of Graft Failure Relative to a Body Mass Index of 18.5 to 24.9 kg/m^2

Body Mass Index, kg/m^2	Hazard Ratio	95% Confidence Interval	p
25 to 29.9	1.015	0.983 to 1.047	0.416
30 to 34.9	1.104	1.065 to 1.145	<0.001
35 to 39.9	1.216	1.158 to 1.276	<0.001
40+	1.248	1.156 to 1.348	<0.001

Type 2 Diabetes

Kervinen et al (2018) looked at the probability of receiving renal transplantation and survival after transplantation for patients with type 2 diabetes mellitus (T2DM).[24.] Using the Finnish Registry for Kidney Diseases, which included 5419 patients between the years 2000 and 2010, 1065 individuals with T2DM were identified, of which 105 received a kidney transplant during follow-up. The relative probability of renal transplantation was 0.25 (95% CI 0.20–0.30, p<0.001) for T2DM patients compared with non-diabetic patients. Survival probabilities at 5 years after transplantation were 88% for T2DM and 93% for non-diabetic patients (adjusted HR for death 1.39, 95% CI 0.82–2.35, p=0.227). The limitations of this study were the relatively small number of T2DM patients receiving kidney transplantation and almost all of these were from deceased donors. Also, the transplantation criteria for T2DM patients in Finland may give better survival rates in the study.

Lim et al (2017) evaluated all-cause mortality following kidney transplantation in patients with T2DM from Australia and New Zealand Dialysis and Transplant Registry.[25.] Of 10714 transplant recipients during the study period, 985 (9%) had T2DM. The 10-year unadjusted OS in patients with an intact graft was 53% for individuals who had diabetes compared with 83% for transplant recipients who did not. The adjusted HR for all-cause mortality in patients with diabetes was 1.60 (95% CI, 1.37 to 1.86; p<0.001), with the excess risk of death attributable to both cardiovascular disease and infection. Graft survival rates at 1, 5, and 10 years were 94%, 85%, and 70% in patients with diabetes compared with 95%, 89%, and 78% in transplant recipients without diabetes (p<0.001), respectively.

Section Summary: Kidney Transplant

A large number of kidney transplants have been performed worldwide. Available data have demonstrated reasonably high survival rates after kidney transplant for appropriately selected patients and significantly higher survival rates for patients undergoing kidney transplant compared with those who remained on a waiting list. HIV infection has not been found to increase the risk of adverse events after kidney transplantation. Obesity and T2DMt may increase the risk of adverse outcomes, and some data have suggested that kidney transplant recipients with HCV have worse outcomes than those without hepatitis C infection; however, data have not shown that patients with these conditions do not benefit from kidney transplants.

Kidney Retransplant

Case Series

Barocci et al (2009) in Italy reported on long-term survival after kidney retransplantation.[26] There were 100 (0.8%) second transplants of 1302 kidney transplants performed at a single-center between 1983 and 2007. Among the second kidney recipients, 1-, 5-, and 10-year patient survival rates were 100%, 96%, and 92%, respectively. Graft survival rates at 1, 5, and 10 years were 85%, 72%, and 53%, respectively.

Registry Studies

Kainz et al (2022) investigated the association of time on waitlist with survival in patients who received a second transplant versus those who remained on the waitlist.[27] A total of 2346 patients from the Austrian Dialysis and Transplant Registry and Eurotransplant were retrospectively analyzed. Results demonstrated that retransplantation improved survival at 10 years of follow-up compared with remaining on the waitlist (HR for mortality, 0.73; 95% CI, 0.53 to 0.95). For patients with a waitlist time for retransplantation of <1 and 8 years after first graft loss, the mean survival time differences at 10 years were 8.0 life months gained (95% CI, 1.9 to 14.0) and 0.1 life months gained (95% CI, -14.3 to 15.2), respectively.

According to data analysis from the OPTN between 2008 and 2015, the 1-year survival rate of patients undergoing a repeat kidney transplant was 97.2 % (95% CI, 96.8 % to 97.5%).[3] The 5-year patient survival rate after a repeat kidney transplant was 88.2 % (95% CI, 87.3 % to 88.8 %).

Children

Gupta et al (2015) retrospectively analyzed OPTN data, focusing on patients who had an initial kidney transplant as children.[28] 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, the length of first graft survival and age at second graft were significantly associated with second graft survival. Specifically, the first graft survival time of more than 5 years was associated with better second graft survival. However, 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.

Potential Contraindications to Kidney Retransplant

HIV Infection

Shelton et al (2017) evaluated outcomes in HIV-infected patients undergoing kidney retransplantation.[29] In adjusted survival analysis, HIV-infected retransplant patients had a significantly increased risk of death compared with HIV-negative patients (HR=3.11; 95% CI, 1.82 to 5.34). Other factors significantly associated with increased risk of death after kidney retransplantation included recipient infection with HCV (HR=1.77; 95% CI, 1.32 to 2.38) and grafts from older donors (HR=1.01; 95 CI, 1.00 to 1.02). The analysis included only 22 HIV-infected patients, which is too small to draw conclusions about the appropriateness of kidney retransplantation in HIV-infected individuals.

Other contraindications are discussed in the section on initial kidney transplants.

Section Summary: Kidney Retransplant

Data have demonstrated reasonably high survival rates after kidney retransplants for appropriately selected patients (e.g., 5-year survival rates ranging from 87% to 96%).

Summary of Evidence

For individuals who have end-stage renal disease without contraindications to kidney transplant who receive a kidney transplant from a living donor or deceased (cadaveric) donor, the evidence includes registry data and case series. Relevant outcomes are overall survival, morbid events, and treatment-related mortality and morbidity. Data from large registries have demonstrated reasonably high survival rates after kidney transplant for appropriately selected patients and significantly higher survival rates for patients undergoing kidney transplant compared with those who remained on a waiting list. Kidney transplantation is contraindicated for patients 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. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have a failed kidney transplant without contraindications to kidney transplant who receive a kidney retransplant from a living donor or deceased (cadaveric) donor, the evidence includes registry data and case series. Relevant outcomes are overall survival, morbid events, and treatment-related mortality and morbidity. Data have demonstrated reasonably high survival rates after kidney retransplant (e.g., 5-year survival rates ranging from 87% to 96%) for appropriately selected patients. Kidney retransplantation is contraindicated for patients for whom the procedure is expected to be futile due to comorbid disease or for whom post transplantation care is expected to significantly worsen comorbid conditions. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

SUPPLEMENTAL INFORMATION

Practice Guidelines and Position Statements

American Society of Transplant Surgeons et al

In 2011, the American Society of Transplant Surgeons, the American Society of Transplantation, the Association of Organ Procurement Organizations, and the UNOS issued a joint position statement recommending modifications to the National Organ Transplant Act of 1984.[30] The joint recommendation stated that the potential pool of organs from HIV-infected donors should 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 Act permitting the use of this group of organ donors.

Ongoing and Unpublished Clinical Trials

Some currently unpublished trials that might influence this review are listed in Table 2.

Table 2. Summary of Key Trials

NCT No.	Trial Name	Planned Enrollment	Completion Date
Ongoing			
NCT04075916	A Trial of Transplanting Hepatitis C Kidneys Into Hepatitis C-Negative Kidney Recipients (THINKER-NEXT)	201	June 2026
Unpublished			
NCT04182607	Donor Outcomes Following Hand-Assisted And Robotic Living Donor Nephrectomy: A Retrospective Review	240	Nov 2022
NCT03500315	HOPE in Action Prospective Multicenter, Clinical Trial of Deceased HIVD+ Kidney Transplants for HIV+ Recipients	360	Sep 2023

NCT: national clinical trial

Government Regulations
National:

Medicare Benefit Policy Manual 100-02. Chapter 11. Rev.257, 03/01/19. Section 140-Transplantation[31]

Medicare pays for the covered services provided a Medicare patient who receives a living or cadaveric transplant. A certified transplant center's (CTC) or organ procurement organization's (OPO) expenses in providing kidneys are included in the transplant provider's living or cadaveric kidney acquisition cost center. To participate in the Medicare program, any CTC or OPO must be a member of the Organ Procurement and Transplantation Network (OPTN). The CTC is required to notify the OPO designated for

its service area of potential donors. (See the Medicare Provider Reimbursement Manual, Part 1, §§2771, for rules in developing a living and cadaveric acquisition charge.)
See the OPTN Web site at http://www.optn.org/members/search.asp or a search facility for various transplant centers, including kidney transplant centers.

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.

Please refer to other applicable sections:

- 140.1-Identifying Candidates for Transplantation
- 140.2-Identifying Suitable Live Donors
- 140.3-Pretransplant Outpatient Services
- 140.4-Pretransplant Impatient Services
- 140.5-Living Donor Evaluation
- 140.9-Post Transplant Services Provided to Live Donor
- 140.11-Cadaver Kidneys
- 140.16-Noncovered Transplant Related Items and Services

Local:

There is no LCD related to kidney transplantation.

(The above Medicare information is current as of the review date for this policy. However, the coverage issues and policies maintained by the Centers for Medicare & Medicare Services [CMS, formerly HCFA] are updated and/or revised periodically. Therefore, the most current CMS information may not be contained in this document. For the most current information, the reader should contact an official Medicare source.)

Related Policies

- Transplant-Heart
- Transplant-Heart-Lung (Combined)
- Transplant-Heart-Kidney (Combined)
- Transplant-Islet Cell
- Transplant-Liver
- Transplant-Lung-Lobar Lung
- Transplant-Pancreas
- Transplant-Small Bowel-Liver/Multivisceral (Combined)
- Transplant-Small Bowel (Isolated)

References

1. Black CK, Termanini KM, Aguirre O, et al. Solid organ transplantation in the 21 st century. Ann Transl Med. Oct 2018; 6(20): 409. PMID 30498736
2. United Network for Organ Sharing (UNOS). Transplant trends. Updated May 17, 2022; https://unos.org/data/transplant-trends/. Accessed January 2025.
3. Organ Procurement and Transplantation Network. View Data Reports. n.d.; https://optn.transplant.hrsa.gov/data/view-data-reports/. Accessed January 2025.
4. National Kidney Foundation. Glomerular Filtration Rate (GFR). n.d.; https://www.kidney.org/atoz/content/gfr. Accessed January 2025.
5. US Department of Health & Human Services. Educational guidance on patient referral to kidney transplantation. September 2015; https://optn.transplant.hrsa.gov/resources/guidance/educational-guidance-on-patient-referral-to-kidney-transplantation/. Accessed January 2025.
6. United Network for Organ Sharing (UNOS). How we match organs. 2022. https://unos.org/transplant/how-we-match-organs/. Accessed June 10, 2022.
7. Organ Procurement and Transplantation Network (OPTN). OPTN policies. Updated April 28, 2022. https://optn.transplant.hrsa.gov/media/1200/optn_policies.pdf.
8. Chaudhry D, Chaudhry A, Peracha J, et al. Survival for waitlisted kidney failure patients receiving transplantation versus remaining on waiting list: systematic review and meta-analysis. BMJ. Mar 01 2022; 376: e068769. PMID 35232772
9. Krishnan N, Higgins R, Short A, et al. Kidney Transplantation Significantly Improves Patient and Graft Survival Irrespective of BMI: A Cohort Study. Am J Transplant. Sep 2015; 15(9): 2378-86. PMID 26147285
10. Querard AH, Foucher Y, Combescure C, et al. Comparison of survival outcomes between Expanded Criteria Donor and Standard Criteria Donor kidney transplant recipients: a

systematic review and meta-analysis. Transpl Int. Apr 2016; 29(4): 403-15. PMID 26756928
11. Pestana JM. Clinical outcomes of 11,436 kidney transplants performed in a single center - Hospital do Rim. J Bras Nefrol. Jul-Sep 2017; 39(3): 287-295. PMID 28902233
12. Segev DL, Muzaale AD, Caffo BS, et al. Perioperative mortality and long-term survival following live kidney donation. JAMA. Mar 10 2010; 303(10): 959-66. PMID 20215610
13. Muller E, Barday Z, Mendelson M, et al. HIV-positive-to-HIV-positive kidney transplantation--results at 3 to 5 years. N Engl J Med. Feb 12 2015; 372(7): 613-20. PMID 25671253
14. Locke JE, Reed RD, Mehta SG, et al. Center-Level Experience and Kidney Transplant Outcomes in HIV-Infected Recipients. Am J Transplant. Aug 2015; 15(8): 2096-104. PMID 25773499
15. Locke JE, Mehta S, Reed RD, et al. A National Study of Outcomes among HIV-Infected Kidney Transplant Recipients. J Am Soc Nephrol. Sep 2015; 26(9): 2222-9. PMID 25791727
16. Locke JE, Gustafson S, Mehta S, et al. Survival Benefit of Kidney Transplantation in HIV-infected Patients. Ann Surg. Mar 2017; 265(3): 604-608. PMID 27768622
17. Sawinski D, Forde KA, Eddinger K, et al. Superior outcomes in HIV-positive kidney transplant patients compared with HCV-infected or HIV/HCV-coinfected recipients. Kidney Int. Aug 2015; 88(2): 341-9. PMID 25807035
18. Zheng X, Gong L, Xue W, et al. Kidney transplant outcomes in HIV-positive patients: a systematic review and meta-analysis. AIDS Res Ther. Nov 20 2019; 16(1): 37. PMID 31747972
19. Working Party of the British Transplantation Society. Kidney and Pancreas Transplantation in Patients with HIV. Second Edition (Revised). 2017. https://bts.org.uk/wp-content/uploads/2017/04/02_BTS_Kidney_Pancreas_HIV.pdf. Accessed June 10, 2022.
20. Fabrizi F, Martin P, Dixit V, et al. Meta-analysis of observational studies: hepatitis C and survival after renal transplant. J Viral Hepat. May 2014; 21(5): 314-24. PMID 24716634
21. Gill JS, Lan J, Dong J, et al. The survival benefit of kidney transplantation in obese patients. Am J Transplant. Aug 2013; 13(8): 2083-90. PMID 23890325
22. Pieloch D, Dombrovskiy V, Osband AJ, et al. Morbid obesity is not an independent predictor of graft failure or patient mortality after kidney transplantation. J Ren Nutr. Jan 2014; 24(1): 50-7. PMID 24070588
23. Kwan JM, Hajjiri Z, Metwally A, et al. Effect of the Obesity Epidemic on Kidney Transplantation: Obesity Is Independent of Diabetes as a Risk Factor for Adverse Renal Transplant Outcomes. PLoS One. 2016; 11(11): e0165712. PMID 27851743
24. Kervinen MH, Lehto S, Helve J, et al. Type 2 diabetic patients on renal replacement therapy: Probability to receive renal transplantation and survival after transplantation. PLoS One. 2018; 13(8): e0201478. PMID 30110346
25. Lim WH, Wong G, Pilmore HL, et al. Long-term outcomes of kidney transplantation in people with type 2 diabetes: a population cohort study. Lancet Diabetes Endocrinol. Jan 2017; 5(1): 26-33. PMID 28010785
26. Barocci S, Valente U, Fontana I, et al. Long-term outcome on kidney retransplantation: a review of 100 cases from a single center. Transplant Proc. May 2009; 41(4): 1156-8. PMID 19460504
27. Kainz A, Kammer M, Reindl-Schwaighofer R, et al. Waiting Time for Second Kidney Transplantation and Mortality. Clin J Am Soc Nephrol. Jan 2022; 17(1): 90-97. PMID 34965955

28. Gupta M, Wood A, Mitra N, et al. Repeat Kidney Transplantation After Failed First Transplant in Childhood: Past Performance Informs Future Performance. Transplantation. Aug 2015; 99(8): 1700-8. PMID 25803500
29. Shelton BA, Mehta S, Sawinski D, et al. Increased Mortality and Graft Loss With Kidney Retransplantation Among Human Immunodeficiency Virus (HIV)-Infected Recipients. Am J Transplant. Jan 2017; 17(1): 173-179. PMID 27305590
30. American Society of Transplant Surgeons (ASTS), The American Society of Transplantation (AST), The Association of Organ Procurement Organizations (AOPO), et al. Statement on transplantation of organs from HIV-infected deceased donors. 2011; https://asts.org/docs/default-source/position-statements/transplantation-of-organs-from-hiv-infected-deceased-donors-july-22-2011.pdf?sfvrsn=fbae5a20_4. Accessed January 2025.
31. Centers for Medicare & Medicaid Services. Medicare Benefit Policy Manual: Chapter 11 - End Stage Renal Disease (ESRD). 2019; https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/Downloads/bp102c11.pdf. Accessed January 2025.
32. Improving Global Outcomes (KDIGO) Kidney Transplant Candidate Work Group. KDIGO Clinical Practice Guideline on the Evaluation and Management of Candidates for Kidney *Transplantation*. *Transplantation.* 2020;104: S1–S103.
33. Warady BA, and Shroff R. Overview of kidney replacement therapy for children with chronic kidney disease. UpToDate. https://www.uptodate.com. Last reviewed February 2025.

The articles reviewed in this research include those obtained in an Internet based literature search for relevant medical references through January 2025, the date the research was completed.

Joint BCBSM/BCN Medical Policy History

Policy Effective Date	BCBSM Signature Date	BCN Signature Date	Comments
1/1/22	10/19/21		Joint policy established
1/1/23	10/18/22		Routine policy maintenance, no change in policy status. Added references 8 and 27.
1/1/24	10/17/23		Routine policy maintenance, no change in policy status. Vendor managed: N/A (ds)
5/1/24	3/7/24		Routine review, referenced the KDIGO guidelines, guidelines also mentioned in inclusion/exclusion section. Policy status unchanged. Title change: Transplant-Kidney. Vendor managed: N/A (ds)
5/1/25	2/18/25		Minor changes made to MPS and inclusion section. No change in policy status. Vendor managed: N/A (ds)

Next Review Date: 1st Qtr. 2026

Pre-Consolidation Medical Policy History

Original Policy Date	Comments
BCN:	Revised:
BCBSM:	Revised:

BLUE CARE NETWORK BENEFIT COVERAGE
POLICY: TRANSPLANT-KIDNEY

I. Coverage Determination:

Commercial HMO (includes Self-Funded groups unless otherwise specified)	Covered per policy
BCNA (Medicare Advantage)	See government section
BCN65 (Medicare Complementary)	Coinsurance covered if primary Medicare covers the service.

II. Administrative Guidelines:

- The member's contract must be active at the time the service is rendered.
- Coverage is based on each member's certificate and is not guaranteed. Please consult the individual member's certificate for details. Additional information regarding coverage or benefits may also be obtained through customer or provider inquiry services at BCN.
- The service must be authorized by the member's PCP except for Self-Referral Option (SRO) members seeking Tier 2 coverage.
- Services must be performed by a BCN-contracted provider, if available, except for Self-Referral Option (SRO) members seeking Tier 2 coverage.
- Payment is based on BCN payment rules, individual certificate and certificate riders.
- Appropriate copayments will apply. Refer to certificate and applicable riders for detailed information.
- CPT - HCPCS codes are used for descriptive purposes only and are not a guarantee of coverage.