KIDNEY TRANSPLANTATION
INCLUDING: KIDNEY/LIVER, KIDNEY/HEART & KIDNEY/LUNG

Policy Number: 2014M0051A  Effective Date: April 1, 2014

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INSTRUCTIONS:

“Medical Policy assists in administering UCare benefits when making coverage determinations for members under our health benefit plans. When deciding coverage, all reviewers must first identify enrollee eligibility, federal and state legislation or regulatory guidance regarding benefit mandates, and the member specific Evidence of Coverage (EOC) document must be referenced prior to using the medical policies. In the event of a conflict, the enrollee’s specific benefit document and federal and state legislation and regulatory guidance supersede this Medical Policy. In the absence of benefit mandates or regulatory guidance that govern the service, procedure or treatment, or when the member’s EOC document is silent or not specific, medical policies help to clarify which healthcare services may or may not be covered. This Medical Policy is provided for informational purposes and does not constitute medical advice. In addition to medical policies, UCare also uses tools developed by third parties, such as the InterQual Guidelines®, to assist us in administering health benefits. The InterQual Guidelines are intended to be used in connection with the independent professional medical judgment of a qualified health care provider and do not constitute the practice of medicine or medical advice. Other Policies and Coverage Determination Guidelines may also apply. UCare reserves the right, in its sole discretion, to modify its Policies and Guidelines as necessary and to provide benefits otherwise excluded by medical policies when necessitated by operational considerations.”
POLICY DESCRIPTION:
This policy describes the use of kidney transplants, a surgery to place a healthy kidney into a person with chronic end stage kidney failure. A kidney transplant involves the surgical removal and transfer of a kidney from a living related or unrelated donor or cadaver donor into a recipient. The transplanted kidney takes over the work of the two kidneys that failed, so the patient will no longer need dialysis.

COVERAGE RATIONALE / CLINICAL CONSIDERATIONS:

I. Kidney Transplantation, Kidney/Liver, Kidney/Heart & Kidney/Lung
   Kidney Transplantation including kidney/liver, kidney/heart or kidney/lung, with either a living or cadaver donor, is considered MEDICALLY NECESSARY for individuals with ANY of the following indications (not an all-inclusive list):
   1. End-stage Renal Disease (ESRD):
      o Chronic renal failure with a Glomerular Filtration Rate (GFR) < 20 ml/min
      o Chronic renal failure on dialysis
      o Symptomatic uremia
   2. Anticipated ESRD as defined above within next 12 months (preemptive transplantation)
   3. Combined liver/kidney transplant when one or more of the following are present:
      o ESRD patients with cirrhosis and symptomatic portal hypertension or hepatic vein wedge pressure with gradient > 10 mm Hg
      o ESLD and CKD with GFR ≤ 30 ml/min
      o Patients with acute renal insufficiency including hepatorenal syndrome with creatinine ≥ 2 mg/dl and dialysis ≥ 8 weeks
      o Patients with ESLD and evidence of CKD and kidney biopsy demonstrating > 30% glomerulosclerosis or 30% fibrosis
   4. Combined heart/kidney transplant
      o Low risk patients with ESRD or CKD with eGFR < 33 ml/min
   5. Retransplantation after a failed primary kidney transplant
      o Usually due to primary non-function, rejection, recurrent disease and/or immunosuppression toxicity

II. Xenotransplantation
   Xenotransplantation of solid organ (e.g., porcine xenografts) is considered INVESTIGATIONAL AND/OR EXPERIMENTAL because its safety and/or effectiveness has not been established.

Clinical Considerations:
- Kidney transplantation is the treatment of choice for suitable patients with end-stage kidney disease.
- For multi-organ transplant, patient must meet criteria for each organ.
- Candidates should be referred to a transplant center as soon as it appears probable that renal replacement therapy (dialysis) will be needed within the next 6–12 months. While the transplant
evaluation of persons with kidney disease may be indicated, the medical necessity for transplantation itself depends on the results of the evaluation.

- Candidates that have completed an evaluation and been accepted by the kidney transplantation center should be informed that placement on the cadaveric waiting list does not guarantee transplantation, since changes in their medical status may delay or preclude transplantation.
- Wait times in many parts of the country can last for years, particularly for those with blood groups O and B and those who are highly sensitized.
  - Patients should be very strongly encouraged to consider living donation and to seek out potential donors.
  - Double listing in another region with a shorter wait time should be discussed and encouraged if the patient’s living situation will allow the flexibility to do this.
- Patients over the age of 70, high dose systemic corticosteroid use (> 10 mg prednisone/day or equivalent), or BMI < 20 or > 30 kg/m² must be referred to the Medical Director.
  - Due to the very long wait times and the likely increased burden of comorbid conditions, patients over the age of 70 are not considered for deceased donor transplantation by many kidney transplant programs. In many instances, while a member between 70 – 75 years of age may not be considered for a deceased donor transplant, a center may be willing to evaluate an older patient for a living donor transplant.
  - There are few data to suggest which if any obese patients should be denied transplantation based on obesity per se (refer to requesting program Patient Selection Criteria).
- Member must have potential for conditioning and rehabilitation after transplant (e.g., member is not moribund).
- Patients with primary oxalosis with ESRD should be considered for combined liver/kidney transplant.
- Pediatric patients should have a normal history and physical, or if symptomatic heart disease, cardiac testing done that indicates an ejection fraction (EF) > 40%, normal wall motion, and left ventricular shortening fraction (SF) > 27%. If the EF or SF is abnormal, consultation with a pediatric cardiologist is necessary as the abnormality may be due to chronic fluid overload and/or hypertension.
- No malignancy (except for non-melanomatous skin cancers) or malignancy has been completely resected or (upon individual case review) malignancy has been adequately treated with no substantial likelihood of recurrence with acceptable future risks.
- Adequate pulmonary, liver and heart function. ESRD patients with lung and/or heart failure should be evaluated for combined lung-kidney or heart-kidney transplantation.
- No uncontrolled and/or untreated psychiatric disorders that interfere with compliance to a strict treatment regimen and would place a transplanted organ at serious risk of failure.
- No active alcohol or chemical dependency that interferes with compliance to a strict treatment regimen.
- Patient/guardian and family/social support system are able to comply with the treatment regimen and the necessary follow-up. Inadequate funding to pay for immunosuppressive medications post-transplant are addressed and resolved.
- Congenital abnormalities will preclude or prevent transplantation. Refer to Medical Director.
- HIV (human immunodeficiency virus) positive patients, who meet the following criteria, as stated in the guidelines of the American Society of Transplantation, could be considered candidates for kidney transplantation:
CD4 count >200 cells per cubic millimeter for >6 months, and
HIV-1 RNA undetectable, and
On stable antiretroviral therapy >3 months, and
No other complications from AIDS (acquired immune deficiency syndrome) (e.g., opportunistic infection, including aspergillus, tuberculosis, coccidiosis mycosis, resistant fungal infections, Kaposi’s sarcoma, or other neoplasm); and
Meeting all other criteria for transplantation.

Contraindications:
Significant uncorrectable life-limiting medical conditions:
- Malignancy that is expected to significantly limit future survival
- Systemic illness or comorbidities that would be expected to substantially and negatively impact the successful completion and/or outcome of transplant surgery (e.g., autoimmune, collagen vascular disease)
- Peripheral vascular disease not amenable to surgical or percutaneous therapy
- Presence of irreversible end-organ diseases (e.g., heart, hepatic, pulmonary), unless person is to undergo dual organ transplantation (e.g., kidney-heart, kidney-liver, etc.)
- Presence of severe pulmonary hypertension with irreversibly high pulmonary vascular resistance
- Presence of a recent intra-cranial cerebrovascular event with significant persistent deficit
- Presence of bleeding peptic ulcer or diverticulitis
- Presence of life-threatening neuromuscular disorders
- Persistent, recurrent or unsuccessfully-treated major or systemic infections
- Infections
  - Acquired Immunodeficiency Syndrome (AIDS)
  - Systemic or uncontrolled infection including sepsis
  - Presence of hepatitis B antigen

BACKGROUND:
End-stage renal disease (ESRD) occurs when the kidneys are no longer able to function at a level that is necessary for day-to-day life. ESRD almost always follows chronic kidney failure, which may exist for a number of years and most often results from any disease that causes gradual destruction of the internal structures of the kidneys. The 3 diseases most commonly leading to ESRD and treated by kidney transplantation are: (1) diabetes mellitus type-I, (2) glomerulonephritis, and (3) hypertensive nephrosclerosis, accounting for about 75 % of the total candidate population. Other diseases that may lead to ESRD include hypertension, polycystic kidneys, nephrosclerosis, chronic pyelonephritis, glomerulonephritis, kidney stones, renal cell carcinoma and Wilm’s tumor.

Patients with ESRD have 3 options for renal replacement therapy: (1) hemodialysis; (2) chronic ambulatory peritoneal dialysis; or (3) transplantation. The choice should be based on the relative risks and benefits. With the increasing appreciation that transplantation results are superior to those of chronic dialysis, the indications for transplantation have been broadened. Improvements in peri-operative care and immunosuppression have allowed many patients who would previously have been denied transplantation consideration as acceptable candidates. The best recipients for transplantation are young individuals.
whose renal failure is not due to a systemic disease that will damage the transplanted kidney or cause death from extra-renal causes.

The time a patient has spent on dialysis is an independent predictor of a poorer outcome from renal transplantation. Pre-emptive renal transplantation generally leads to better outcomes than transplantation after dialysis is initiated, and should be pursued in most cases for live donor transplants. The current shortage of cadaveric kidneys makes it unlikely that pre-emptive transplants will be a practical option for recipients of cadaveric kidney transplants.

No specific cause of intrinsic and irreversible renal failure is considered a contraindication to kidney transplantation. Nonetheless, all patients still should have reversible causes of renal dysfunction excluded before considering renal replacement therapy e.g., obstructive nephropathy has to be removed, chronic pyelonephritis secondary to recurrent infection has to be adequately treated, and reflux has to be fixed.

The evaluation of all transplant candidates, in addition to a standard medical work-up, should include cytomegalovirus (CMV) antibody titer; creatinine clearance; serology for syphilis, and hepatitis B (HBV) and C (HCV) viruses; evaluation of parathyroid status; coagulation profile; Pap smear; ABO and histocompatibility typing; urologic evaluation (including a voiding cystourethrogram in selected patients to assess outlet obstruction and reflux); gastro-intestinal evaluation (as warranted by history of ulcer, diverticulitis, or other symptoms); and psychosocial evaluation.

Patients with renal failure induced by diabetes (Kimmelstiel-Wilson disease) make up the greatest population of patients currently referred for transplantation. Actually, this has become the treatment of choice because persons with diabetes clearly do better with transplantation than with dialysis. In fact, both graft and patient survival for 1 to 2 years are reported to be as good in persons with diabetes as in other patients, whereas on chronic dialysis, less than 20% of persons with diabetes survive 5 years. If diabetic patients can undergo transplantation before extensive damage occurs in other organs, such as the eye and heart, rehabilitation will be more satisfactory. Even patients with diseases in which the transplanted kidney may eventually be damaged by recurrent disease (e.g., lupus erythematosus, cystinosis, and amyloidosis) are often better palliated by transplantation than by dialysis. Indeed, the current results of transplantation mandate serious consideration of this therapy in virtually any patient with terminal renal disease. Not only is the quality of life far better with transplantation than with dialysis, but because the mortality of patients in the first year after transplantation is now less than 5%, survival is also superior.

Careful attention must be given to eradication of all infections including those of the urinary tract, lungs, teeth, and skin. Since cardiovascular complications are as common as infection as a cause of post-transplantation mortality, the patient's cardiovascular status should be carefully evaluated and optimized. In older patients and diabetic patients, this might require stress testing, cardiac catheterization, or even pre-transplant coronary artery bypass. Age is never an absolute contraindication for kidney transplantation. Although infants have had successful transplantations, most centers maintain infants on dialysis until body size is increased to 10 to 20 kg. Older patients are becoming more numerous in transplant clinics. Older age (greater than 65 years) never precludes transplantation, but it increases the risk of complications. Transplant centers usually encourage older patients who have multiple medical problems (rather than isolated kidney failure) to remain on dialysis. On both ends of the age spectrum, however, transplantation is becoming more common. Malignancy is considered a contraindication for kidney transplantation, as is severe atherosclerotic or pulmonary disease. Patients with active liver disease are also usually excluded. Both hepatitis B and C can result in eventual liver failure in some patients after transplantation.
The proper timing of transplantation is a delicate decision because the progression of renal dysfunction is variable and premature imposition of the risks of transplantation is not justified. However, dialysis or transplantation should not be withheld until advanced uremic symptoms, such as pericarditis, cardiac failure, severe anemia, osteodystrophy and neuropathy, ensue because these complications may become irreversible. Kidney transplantation should be timed to occur as close as possible to when the recipient would be expected to require dialysis; however, transplantation should be delayed in patients who may regain kidney function (e.g., malignant hypertension, severe, acute tubular necrosis). Transplantation performed prior to the need for dialysis is called preemptive transplantation. It confers a survival advantage to the recipient and is more common for recipients of living-donor kidneys. Preemptive kidney transplant has been shown to provide better outcomes compared to transplant after any period of time on dialysis; however, because of the shortage of donors, preemptive transplantation may not be possible.

**Kidney Transplantation**

The transplant procedure can be performed by open surgical approach or laparoscopically. The use of laparoscopic nephrectomy has reduced the length of hospital stay, pain, and recovery time for donors while having no effect on the quality of the donated organ.

There are 3 sources of donor kidneys for kidney transplantation: (1) living related donors; (2) cadaver donors; and (3) living unrelated donors. Based on data from the Organ Procurement and Transplantation Network in 2011, about a third of kidney transplants in the U.S. (5,769 of 16,812) were performed using organs from living donors. Living donors can be related or unrelated to the recipient. Living kidney donation eliminates the recipient’s need for waiting time on a national waiting list, are often more successful, and can add psychological benefits to both donor and recipient. Nonetheless, the benefit to the recipient of a live-donor organ must outweigh the risks to the donor. In the absence of a living donor, many transplanted kidneys come from deceased (e.g., cadaver) organ donors. One, three-, and five-year graft survival rates for cadaver kidney transplantation are 91.9%, 82.4%, and 72.0%, respectively (OPTN, 1997-2004, based on OPTN data as of Feb 7, 2014).

A donor left kidney is usually transplanted to the right iliac fossa, with the renal artery anastomosed end-to-end to the hypogastric artery, and the renal vein end-to-end to the common iliac vein. The ureter is implanted into the bladder and under special conditions an uretero-ureteral anastomosis or uretero-pyelostomy may be performed. Auto-transplantation has developed as an outgrowth of the technique used in renal transplantation. The simultaneous development of an apparatus that could preserve kidneys extracorporeally for long periods of time and of preservation solutions led to extracorporeal renal repair (work-bench surgery) and subsequent auto-transplantation for conditions mentioned above.

On rare occasions, kidneys with lesions of the renal artery or its branches are not amenable to in-situ reconstruction. In these circumstances, temporary removal of the kidney, ex-vivo preservation, microvascular repair (work-bench surgery), and auto-transplantation may permit salvage.

Some examples of clinical conditions where the renal artery or its branches are not amenable to in-situ reconstruction such that a person might benefit from auto-transplantation and/or ex-vivo repair include but are not limited to:
- Abdominal aortic aneurysms that involve the origin of the renal arteries; or
- Disease of the major vessels extends beyond the bifurcation of the main renal artery into the segmental branches; or
- Extensive atheromatous aortic disease when an operation on the aorta itself may prove hazardous; or

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• Multiple vessels supplying the affected kidney are involved; or
• Persons who have large aneurysms, arteriovenous fistulas, or malformations of the kidney; or
• Traumatic arterial injuries.

Donor Matching
In the event that an ABO-identical or minor mismatch donor is unavailable, the use of an ABO mismatched donor may be the best option for some kidney transplantation candidates. Recent studies have demonstrated that an ABO mismatched living donor transplant may result in survival rates close to those achieved with compatible grafts, although recipients with high anti-blood group titers before plasmapheresis have been reported to have higher rates of humeral rejection and early graft loss.

Extended Criteria Donor Kidney
In an effort to address the shortage of kidneys available for transplantation, the kidney allocation algorithm was modified in October 2002 to expedite the distribution of kidneys with less favorable donor characteristics, known as extended criteria donor (ECD) kidneys. This includes kidneys from donors over the age of 60 or ages 50–60 with two or all three of the following criteria:
• Pre-donation serum creatinine greater than 1.5 mg/dL (milligrams per deciliter)
• Stroke as cause of death
• Hypertension

Graft and patient survival for ECD kidney recipients are not as favorable as those for non-ECD kidney recipients, and both of these groups have lower survival than patients who received living-donor kidneys.

Retransplantation
In general, retransplantation is considered by some to be a controversial procedure, in part due to ethical concerns over the limited supply of organs. A wide range of donor, recipient and other transplant-related factors can influence graft survival. In the event of renal graft failure, renal replacement therapy consists of either dialysis or retransplantation. Although allograft survival is considered good, it is considerably less compared to the primary transplant. Candidates awaiting kidney retransplant are often allosensitized and may be less likely to receive a transplant than primary candidates. As a result, some transplant centers have developed ongoing efforts involving desensitization protocols to prevent antibody-mediated acute rejection.

Although desensitization protocols may be considered for deceased donor kidney, protocols are generally attempted with living donation so that antibody response against donor tissue can be monitored; patients proceed to transplant surgery only if antibody levels are low. Authors contend that desensitizing highly sensitive patients improves clinical outcomes (short-term patient and graft survival) however acute antibody-mediated rejection is a barrier in 20-30% of patients and there is no consensus regarding which protocol is ideal.

REGULATORY STATUS:

Health Resources Services Administration (HRSA): The U.S. Department of Health and Human Services (DHHS) has oversight responsibility for the organ allocation system in the United States. Congress established the Organ Procurement and Transplantation Network (OPTN) when it enacted the National Organ Transplant Act (NOTA) of 1984. The Act called for a unified transplant network to be operated by a private, nonprofit organization under federal contract. The DHHS solicited proposals in 1986 for the
operation of OPTN. The United Network for Organ Sharing (UNOS) was awarded the initial OPTN contract on September 30, 1986, and continues to administer OPTN. HRSA, within the DHHS, administers the contract with UNOS. Effective March 16, 2000, DHHS implemented a Final Rule establishing a regulatory framework for the structure and operations of OPTN. Under the terms of the Final Rule, policies intended to be binding for OPTN members are developed through the OPTN committees and Board of Directors and then submitted to the Secretary of HHS for final approval (OPTN, 2010; OPTN, 2013; UNOS, 2013).

Organ Procurement and Transplantation Network (OPTN) / United Network for Organ Sharing (UNOS): In the United States, transplant centers are required to report to OPTN and recently NOTA required that OPTN develop medical criteria for more equitable organ allocation to ensure fair and ethical access to organs by patients (OPTN, 2010; OPTN, 2013). The current kidney allocation system has been in place for more than 20 years, and although some changes have been made, the system cannot keep up with current trends in medicine. As waiting times for kidney transplant increase throughout the United States, the need for review of the current system and discussion of possible revisions is great. Thus, the OPTN/UNOS Kidney Transplantation Committee recently requested feedback from the transplant community and the public on a concept document, and is now considering these comments in an evaluation of approaches to kidney allocation. Additional descriptions of organ allocation procedures, patient eligibility to be entered on a waiting list for organ(s), and pertinent definitions is located on the UNOS and OPTN websites (OPTN, 2010; OPTN, 2013; UNOS, 2013).

1. U.S. FOOD AND DRUG ADMINISTRATION (FDA):
   As a procedure, simultaneous pancreas-kidney (SPK) transplant is not regulated by the FDA. The Center for Biologics Evaluation and Research (CBER) does not regulate vascularized human organ transplants such as kidney, liver, heart, lung, or pancreas. The Health Resources Services Administration (HRSA) oversees the transplantation of vascularized human organs (CBER, 2010).

2. CENTERS FOR MEDICARE AND MEDICAID SERVICES (CMS):
   140 – Transplantation (Rev. 1, 10-01-03)

   Covered Transplants:
   Medicare covers the following organ transplants: kidney, heart, lung, heart/lung, liver, pancreas, pancreas/kidney, and intestinal/multi-visceral. Medicare also covers stem cell transplants for certain conditions. Medicare has developed a method of reimbursement for the variety of medical services required to support a transplant program, including payment for Medicare’s share of the costs of organ procurement.

   A major treatment for patients with ESRD is kidney transplantation. This involves removing a kidney, usually from a living relative of the patient or from an unrelated person who has died, and surgically placing the kidney into the patient. After the beneficiary receives a kidney transplant, Medicare pays the transplant hospital for the transplant and appropriate standard acquisition charges. Special provisions apply to payment. For the list of approved Medicare certified transplant facilities, refer to the following Web site:

   Noncovered Transplants:
   Medicare will not cover transplants or re-transplants in facilities that have not been approved as
meeting the facility criteria. If a beneficiary is admitted for and receives a transplant from a hospital that is not approved, physicians’ services, and inpatient services associated with the transplantation procedure are not covered.

**Noncovered Transplant Related Items and Services**

(140.16), (Rev. 1, 10-01-03) A3-3178.17.

The following list represents some of the transplant related items and services which are not covered and for which no program payment can be made:

- Travel, room, and board expenses incurred by a live donor;
- Travel, room, and board expenses (to any transplant center) incurred by the recipient;
- Reimbursement for the kidney itself when the live donor or the cadaver donor’s next of kin sells the kidney;
- Transportation of the potential cadaveric donor to the transplant hospital (only transportation of the organ is reimbursable as part of the organ procurement charge); or
- Pronouncement of death and burial expenses for the cadaveric donor.

3. **MINNESOTA DEPARTMENT OF HUMAN SERVICES (DHS):**

MHCP coverage for organ and tissue transplant procedures is limited to those procedures covered by the Medicare program or approved by the DHS consulting contractor. Transplant coverage includes: preoperative evaluation, recipient and donor surgery, follow-up care for the recipient and live donor, and retrieval of organs, tissues. All transplant related services are billed under the recipient’s ID number.

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**CLINICAL EVIDENCE:**

**SUMMARY:**

Kidney transplantation is an accepted and successful treatment for appropriately selected individuals with end-stage renal disease (ESRD) and thus may be considered medically necessary. The transplant evaluation should begin when it is clear that the patient is destined to develop ESRD. Registry and national survey data suggest that live donors of kidneys for transplantation do not have an increased risk of mortality or ESRD.

In the event of subsequent renal graft failure, retransplantation is often performed. Kidney retransplantation after a failed primary transplant may be considered medically necessary, and is supported by national data that suggest similar survival rates after initial and repeat transplants.

Kidney transplantation is not medically necessary in 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. 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.
### APPLICABLE CODES:

The Current Procedural Terminology (CPT®) codes and HCPCS codes listed in this policy are for reference purposes only. Listing of a service or device code in this policy does not imply that the service described by this code is a covered or non-covered health service. The inclusion of a code does not imply any right to reimbursement or guarantee claims payment. Other medical policies and coverage determination guidelines may apply.

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<td>S2152</td>
<td>Solid organ(s), complete or segmental, single organ or combination of organs; deceased or living donor(s), procurement, transplantation, and related complications; including: drugs; supplies; hospitalization with outpatient follow-up; medical/surgical, diagnostic, emergency, and rehabilitative services, and the number of days pre- and post-transplant care in the global definition</td>
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<td>585.6</td>
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<tr>
<td>T86.10-T86.19</td>
<td>Complications of kidney transplant</td>
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<td>53300</td>
<td>Donor nephrectomy (including cold preservation); from cadaver donor, unilateral or bilateral</td>
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<td>50320</td>
<td>Donor nephrectomy (including cold preservation); open, from living donor</td>
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<td>50323</td>
<td>Backbench standard preparation of cadaver donor renal allograft prior to transplantation; including dissection and removal of perinephric fat diaphragmatic and retroperitoneal attachments, excision of adrenal gland, and preparation of ureter(s), renal vein(s), and renal artery(s), ligating branches, as necessary</td>
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<tr>
<td>50324</td>
<td>Backbench standard preparation of living donor renal allograft (open or laparoscopic) prior to transplantation, including dissection and removal of perinephric fat and preparation of ureter(s), renal vein(s), and renal artery(s), ligating branches, as necessary</td>
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<td>50547</td>
<td>Laparoscopy, surgical; donor nephrectomy (including cold preservation), from living donor</td>
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REFERENCES:

43. Shrestha BM. Strategies for reducing the renal transplant waiting list: a review. Exp Clin Transplant 2009;


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