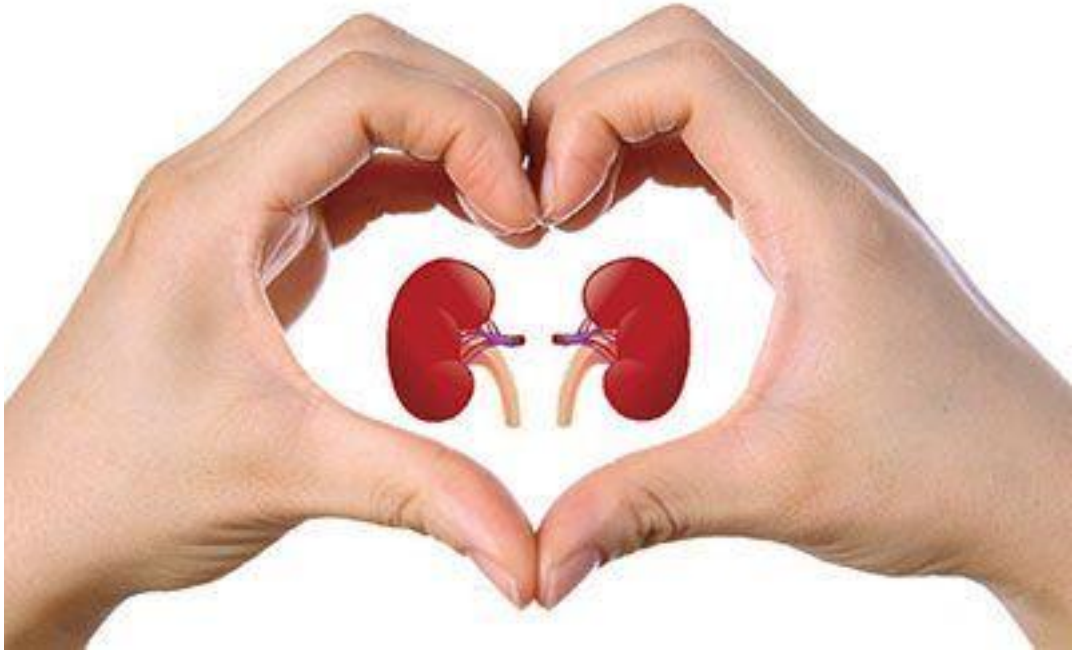
Transplant Kidney



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Benefits of Transplantation

- Life expectancy
- Cardiovascular benefits
- Quality of life
- Socioeconomic benefits

Pre-transplantation

- Patient referral
- Patient assessment
- Pre-Transplant Immunization
- Patient approval
- Patient status while waiting
- Donor Selection (Living VS Deceased)
- Kidney Organ Offering and Allocation

Time for referral

- Potential transplant recipients should be referred for evaluation by a transplant program once renal replacement therapy is expected to be required within the next 12 months (Grade C).
- Patients already requiring dialysis support should be referred for transplant evaluation as soon as their medical condition stabilizes (Grade C).

Absolute contraindications

- Active infections
- Active malignancy.
- Active substance abuse
- Reversible renal failure
- Uncontrolled psychiatric disease.
- Documented active and ongoing treatment nonadherence.
- A significantly shortened life expectancy < 1 yr

Age and functional capacity

- Advanced age per se is not a contraindication to kidney transplantation (Grade B).
- Very young age and small size should not prevent early referral for transplant evaluation (Grade B).
- Cognitive or neurodevelopmental delay is not an absolute contraindication to renal transplantation in children (Grade B).

Initial evaluation

- History and Physical Examination
  - Determine cause of underlying renal disease
  - Estimation of urine output
  - Result of kidney biopsy if available
  - Family history (ADPKD, Alport syndrome)
  - Potentially recurring renal diseases after transplantation
  - Symptoms of cardiac disease
  - Risk factors for CAD (DM , smoking, DLP, dyslipidemia, premature death in family)
  - History of claudication
  - Hx possible exposure to tuberculosis and other infection, previous treatment

Initial screening studies

- ABO group, CBC, BUN, Cr, electrolytes, calcium, phosphorous, albumin, LFTs prothrombin time, partial thromboplastin time, iPTH, and HbA1c (for diabetic patients).
- Pregnancy test for fertile women.
- Serology for varicella, measles, mumps, and rubella viruses. If a potential recipient is found to be nonimmune to these common childhood diseases (vaccinated prior to KT)
- Serologic testing for HIV, hepatitis B virus (HBsAg, HBsAb, HBcAb) and HCV
- Human leukocyte antigen (HLA) typing , panel reactive antibody (PRA)
- Urinalysis and urine culture
- Drug screen.

Initial screening studies —

- CXR to exclude tuberculosis/effusion/mass
- ECG
- All men : testicular examination.
- Male >50 years → PSA and DRE (Ealier if strong family history)
- Breast examination and Papanicolaou smear.
- Women > 40 years: mammogram
- Mammography; the age for mammography should be lowered to 35 years if there is a history of breast cancer in the premenopausal years in a first-degree relative.
- All patients >50 years: screening colonoscopy
- Patients who have Hx of Barrett's esophagus should have EGD
- Abdominal and pelvic ultrasounds

Systemic conditions

- Severe hyperparathyroidism : parathyroidectomy prior to transplantation
- Primary oxalosis should be evaluated for combined kidney-liver transplantation.
- Systemic amyloidosis, esp cardiac involvement, may not be candidates for renal transplant due to high mortality
- anti-GBM disease should be considered for KT if circulating anti-GBM antibody is undetectable and they have quiescent disease (off cytotoxic agents) for at least 6 months post-treatment
- SLE should be considered for renal transplantation if they have clinically quiescent disease for at least 6 months off cytotoxic agents
- Renal transplant candidates with vasculitis (Wegener's granulomatosis, microscopic polyangiitis, pauci-immune necrotizing glomerulonephritis, Henoch-Schonlein purpura) should be considered for renal transplantation if they have quiescent disease for at least 12 months off cytotoxic agents

Cardiovascular disease

- Leading cause of death after KT
- Major cause of morbidity and mortality in patients on waiting list

CVD Relative contraindications to KT:

- Progressive symptoms of angina or severe CAD that not amenable to angioplasty or bypass surgery
- History of MI within 3-6 months
- Severe ischemic cardiomyopathy (LVEF <30%)

Cardiac evaluation

- Patients with ≥3 clinical risk factors or diabetes, or PAD
- Screening with noninvasive test, such as a dobutamine stress echocardiogram or myocardial perfusion study
- Dobutamine stress echocardiogram and thallium myocardial perfusion scan both have moderate sensitivity and specificity among kidney transplant candidates
- Pts with negative noninvasive stress test who have diabetes or previous hx of CHD → repeat noninvasive test annually
- If LVEF ≤40 % , PAD , or ≥2 traditional risk factors, we repeat noninvasive testing every 2 years

Indications for pre-transplant nephrectomy

Autosomal-dominant polycystic kidney disease (ADPKD)
Unilateral or bilateral nephrectomy is necessary if there is not enough space for the transplant kidney, or if there are complications, such as cyst infection, cyst rupture with/without haematuria, pain, or abdominal girth.
Nephrectomy can be done before transplantation or simultaneously with similar complication rates and outcomes (2,13,14).
Medically refractory hypertension
Bilateral nephrectomy usually results in less antihypertensive medications (15). It has become rare due to improved control of hypertension with better dialysis and drugs.
Chronically infected kidneys
Suspected renal or urothelial cancer
Urolithiasis
No strong evidence for removal of native kidneys in urolithiasis.
Nephrectomy is necessary if there is a possible risk of infection due to stones.

Infection

- Patient should be free of all untreated, active infection before transplantation.
- Dental infections should be treated prior KT
- Peritonitis, tunnel infections and vascular access-related infections should be fully treated before transplantation

Tuberculosis

- Obtaining clinical history regarding risk factors, duration and type of prior tuberculous therapy
- Review of recent chest X ray
- It is less clear whether prophylaxis reduces the incidence of reactivation of tuberculosis.
- However most centres currently require pre- or post-transplant prophylaxis in patients with a positive test in the absence of prior treatment, provided there are no contraindications to therapy

HIV infection

- HIV per se in not a contra-indication for kidney transplantation. (1C)
- Wait-listing HIV patients only if
  - 1) they are compliant with treatment, particularly HAART therapy
  - 2) their CD4+ T cell counts are > 200/μL and have been stable during the previous 3 months
  - 3) HIV RNA was undetectable during the previous 3 months
  - 4) no opportunistic infections occurred during the previous 6 months
  - 5) they show no signs compatible with progressive multifocal leukoencephalopathy, chronic intestinal cryptosporidiosis, or lymphoma. (1C)

Immunization

List of Vaccines and their use for Dialysis or CKD Patients

Vaccine	Recommended for Dialysis or CKD Patients	Recommended for All Adults	May Use if Otherwise Indicated*	Contraindicated
Anthrax			X	
DTaP/Tdap/Td		X	X	
Hib			X	
Hepatitis A			X	
Hepatitis B	X (see p. 4)			
Human papillomavirus			X	
Influenza (TIV)		X (see p. 6)		
Influenza (LAIV)				X (see p. 6)
Japanese Encephalitis			X	
MMR		X	X	
Meningococcal			X	
Pneumococcal	X (see p. 7)			
Polio (IPV)			X	
Rabies			X	
Rotavirus			X	
Smallpox			X	
Typhoid			X	
Varicella		X	X	
Yellow Fever			X	
Zoster			X	

HBV Vaccination

- Dose : double standard dosage in a 4 dose schedule for hemodialysis patients and other immunocompromised adults (age ≥20 years) patients administered in 1 or 2 injections
- Serologic testing performed 1-2 months after administration of the last dose of the vaccine series by using a method that allows determination of a protective level of anti-HBs (e.g., >10 mIU/mL)
- Persons found to have anti-HBs levels of < 10 mIU/mL repeat 4 double dose vaccination and serologic test

Malignancy screening

- Screening kidney transplant candidates for cancer recommendations that apply to the general population
- Screening kidney cancer by ultrasound
- Screening urothelial cancer by urinary cytology and cystoscopy
- HCV and HBV-infected screening presence of HCC according to the EASL-EORTC Clinical Practice Guideline on the management of hepatocellularcarcinoma
- Current or previous cancer be discussed with an oncologist and considered on a case-by-case basis.

Breast Cancer

- The USPSTF recommends screening mammography, with or without clinical breast examination (CBE), every 1-2 years for women aged 40 and older.

B recommendation

Cervical Cancer

- The USPSTF strongly recommends screening for cervical cancer in women who have been sexually active and have a cervix.

A recommendation

Colorectal Cancer

- The USPSTF strongly recommends that clinicians screen men and women 50 years of age or older for colorectal cancer.

A recommendation

Prostate Cancer

- The U.S. Preventive Services Task Force (USPSTF) concludes that the evidence is insufficient to recommend for or against routine screening for prostate cancer using prostate specific antigen (PSA) testing or digital rectal examination (DRE).

"I" recommendation

Lung cancer

- The USPSTF recommends annual screening for lung cancer with low-dose computed tomography (LDCT) in adults aged 55 to 80 years who have a 30 pack-year smoking history and currently smoke or have quit within the past 15 years.
- Screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery.

Risks of Recurrence of Renal Disease after Transplantation and Risks of Graft Loss as a Result of Recurrence,

Disease	Risk of Recurrence (%)	10-Yr Risk of Graft Loss from Recurrence (%)
Glomerulonephritis		
Focal segmental sclerosis	20-30	8-15
IgA nephropathy	40-50	5-15
Henoch-Schönlein purpura	10-20	5-10
Mesangiocapillary type I	20-30	10-15
Mesangiocapillary type II	80-90	5-10
Membranous	10-20	10-25
Hemolytic-uremic syndrome	10-30	10-15
ANCA-positive vasculitis	10-15	5
Pauci-immune	10-20	5-10
Goodpasture's syndrome (antibody-positive)	100	80
Systemic lupus erythematosus	1	1
Metabolic and Other Diseases		
Diabetic nephropathy	100	Low
Amyloidosis	30	Low
Oxalosis	90-100	80
Cystinosis	0	0
Fabry's disease	100	0
Alport's syndrome*	3-4	2
Light chain nephropathy	10-25	10-30
Mixed essential cryoglobulinemia	50	40
Scleroderma	20	5-10

Stroke

- Older patients with risk factors such as (history of TIA , HT, cigarette smoking, and DLP should be carefully examined for carotid stenosis)
- Perform a screening MRA in all transplant candidates with ADPKD who have a history of headaches or a family history of aneurysm
- If aneurysms >7-10 mm → neurosurgical evaluation prior to transplant

Peripheral vascular disease

- Increased risk of amputation , allograft ischemia, significant morbidity, and poor patient survival
- Femoral, pedal pulses should be assessed esp. diabetes, CVD or history of PAD
- Severe bilateral iliac or lower-extremity arterial disease or large abdominal aneurysms that are contraindications to transplantation
- Options to assess vasculature include Doppler vascular studies , Abdominal radiograph and/or noncontrast CT for iliac calcification to guide ptimal allograft placement

Pulmonary disease

- Following clinical features should not be candidates for kidney transplantation
  - Home oxygen therapy requirement.
  - Uncontrolled asthma.
  - Severe cor pulmonale or uncorrectable moderate to severe pulmonary hypertension.
  - Severe chronic obstructive pulmonary disease/pulmonary fibrosis/restrictive disease.
    - This is defined by best FEV_1 <25 percent predictive value,
    - PO_2 room air <60 mmHg with exercise desaturation SaO_2 <90 percent,
    - more than four lower respiratory tract infections in the last 12 months,
    - In addition to the above contraindications, candidates with uncorrectable moderate to severe pulmonary hypertension may not be eligible for kidney transplant.

Obesity

- Defined by a BMI >30 kg/m^2 are at increased risk for adverse outcomes including delayed graft function, surgical complications including poor wound healing and infection and NODAT
- Weight loss prior to KT is often recommended, although there are no data that demonstrate a benefit of this intervention

Thank You