

Renal Transplant

UNDERSTANDING THE FACTS BEHIND

1. Definition

- Renal transplant is the curative treatment for End Stage Renal Disease (ESRD).
- Kidneys are usually recovered from deceased donors (70%) but can be obtained from living donors such as family members of the patients
- Deceased donors are either:
 - DBD → Donation after Brainstem Death
 - DCD → Donation after Circulatory Death
- The one year survival rate for living donor recipients is about 99% and for DBD donor recipients is about 97%.

2 Indications for renal transplant

- Patients with ESRD (stage 5) → GFR < 15ml/min
- Those with Chronic Kidney Disease (CKD) (stage 4) → GFR 15-29ml/min
 - Should be considered for transplant if they have rapidly progressing disease

3. Contraindications for renal transplant

Absolute	Relative
Untreated malignancy	Co-morbidities, e.g. diabetes mellitus
Active infection	Age >65 years
Untreated HIV infection or AIDS	Obesity
Any condition with a life expectancy <2 years	HBV or HCV infection
Malignant melanoma within the previous 5 years	Previous malignancy (depending on type)

STAGES OF CHRONIC KIDNEY DISEASE	GFR*	% OF KIDNEY FUNCTION
Stage 1 Kidney damage with normal kidney function	90 or higher	90-100%
Stage 2 Kidney damage with mild loss of kidney function	89 to 60	89-60%
Stage 3a Mild to moderate loss of kidney function	59 to 45	59-45%
Stage 3b Moderate to severe loss of kidney function	44 to 30	44-30%
Stage 4 Severe loss of kidney function	29 to 15	29-15%
Stage 5 Kidney failure	Less than 15	Less than 15%

* Your GFR number tells you how much kidney function you have. As kidney disease gets worse, the GFR number goes down.

4. Donor retrieval procedure (DBD/DCD)

- Full exposure of the abdomen to allow assessment of other organs whilst gaining access to the retroperitoneal space
- Patient is heparinised
- Renal vessels and ureters are identified and isolated
- Kidneys are then removed with the renal artery (containing a patch of the aorta), the renal vein (containing a patch of the IVC) and its ureter.

In both cases the kidney is flushed with preservation fluid as soon as it is removed

6. Recipient procedures

- In some cases the kidney will be arriving from another facility and must be stored in a specific way:
 - In perfusion fluid
 - Inside sterile bags
 - Surrounded by ice
- The kidney is then examined and flushed with preservation fluid to check for and repair any leaks in the vessels or ureter.
 - Iliac vessels are exposed and lymphatics identified and ligated
 - Anastomosis performed:
 - Donor's renal vein → recipient's external iliac vein
 - Donor's renal artery → recipient's internal/external iliac artery
 - Kidney is perfused
 - Ureter anastomosed to the bladder through a ureteroneocystostomy

7. Complications

- Delayed graft function → failure of the transplanted kidney to function immediately
 - Dialysis required within the first week
 - Most kidneys will function eventually but increased risk of rejection → recipient's immune system begins to destroy donor organ
- Vascular
 - Early
 - Renal artery/vein thrombosis
 - Late
 - Renal artery stenosis. Presents months post transplant with uncontrollable hypertension and worsening graft function
- Ureteral
 - Leaks
 - Decreased urine output & increasing abdominal pain
 - Urinary tract obstruction
 - Strictures in the distal ureter
- Long term
 - CVS complications
 - Immunosuppression → recurrent infection, malignancy

5. Living donor

- Procedure is commonly done laparoscopically
- Preference for left kidney → longer renal vein
- No patch of the IVC or aorta is taken

8. Warm vs Cold Ischemia time

- Warm → time between the cessation of organ perfusion by the donor's blood circulation until perfusion with preservation solution
- Cold → time from the perfusion of the organ with the preservation solution to re-perfusion of the organ with recipient blood after the implant's vascular anastomosis.