

Medication Do's & Don'ts

- **AVOID**
 - Live vaccines
 - Non-steroidal anti-inflammatory drugs (NSAIDs)
 - Cyp3A4 inducers/inhibitors e.g. phenytoin, rifampicin, clarithromycin, Paxlovid (significant interactions)
- **CAUTION**
 - Cyp3A4 inducers/inhibitors e.g. carbamazepine, azole antifungals, (significant interactions but manageable with additional monitoring and dose adjustments)
 - Herbal products e.g. St John's wort, Turmeric
 - Grapefruit and Seville oranges
 - Different tacrolimus/ciclosporin brands
 - Pregnancy (mycophenolate is teratogenic)
 - ACEI/ARB's (monitor GFR)

What to consider in transplant patients admitted to a non-transplant centre

- Ensure correct immunosuppression brand is prescribed and dispensed
- Monitor patient's renal function and ensure new medicines prescribed are appropriate doses
- Appropriate TDM
- Beware drug-drug interactions
- High alert for opportunistic infections like CMV as often missed in non-transplant centres

Contact us:

UK Renal Pharmacy Group
X @renalpharmacy
rpg@renal.org
ukkidney.org/rpg

Who is a candidate for kidney transplant?

- All CKD 5 patients fit for major surgery and for chronic immunosuppression
- All patients predicted to have an increased life expectancy post-transplantation
- Placement on the transplant waiting list will be limited by individual co-morbidity and prognosis
- Age is not a contraindication to transplantation but age-related co-morbidity is an important limiting factor.

Long-term challenges

- Chronic Allograft Nephropathy (CAN) is now the major challenge: use of CNIs, early acute rejection, CMV infection, BKV infection and non-adherence have all been implicated
- Acute Antibody Mediated Rejection and T-cell Mediated Rejection are a significant challenge – managed with plasma exchange, IVIg, Rituximab, steroids or antithymocyte immunoglobulin (ATG) etc.
- Increased infection risk - UTIs, CMV, PCP, fungal
- Increased risk of cancer e.g. cervical cancer, skin malignancies
- Rare Post Transplant Lymphoproliferative Disorder (PTLD) is associated with cumulative immunosuppression 'load' and can occur any time after transplantation
- New onset diabetes after transplantation
- Cardiovascular risk; Hypertension, Hyperlipidaemia

Other adverse effects of immunosuppressant medications include:

- Adherence
- Osteodystrophy
- Ciclosporin - hirsutism, acne gum hypertrophy
- Tacrolimus - alopecia
- Sirolimus - acne

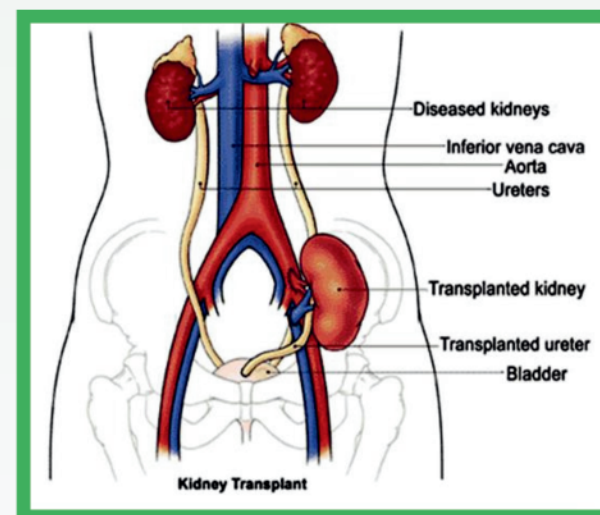
Final tip:

Don't assume a kidney transplant patient has normal kidney function – a few do, but many don't. Calculate kidney function as usual and then amend drug doses accordingly.

Medicines Optimisation in Kidney Transplantation



A kidney transplant is a surgical procedure in which a healthy kidney from one person is placed into another whose kidneys have stopped working.



Kidney Transplantation

- Transplantation is a form of Kidney Replacement Therapy (KRT)
- There are 23 adult kidney transplant centres in the UK
- There are approximately 40,000 working kidney transplant recipients in the UK with over 3,000 performed each year
- Average time for adults waiting for kidney transplant is 2-3 years and a transplant from a deceased donor lasts 10-15 years and a transplant from a living donor around 15-20 years
- On average, dialysis requires ongoing treatment and significant resources each year. In contrast, kidney transplant involves a one-time surgery followed by long-term use of immunosuppressive medications to maintain the transplant.

Benefits of kidney transplant

- Improved survival
- Improved Quality of Life
- Improved fertility
- Near normal lifestyle with freedom to travel, eat normally, drink and work
- Cost benefit to the NHS

Donor register

Find out what's involved, who you could help and what choices you could make at: www.organdonation.nhs.uk

Types of transplant

- Cadaveric – from a deceased donor (can be either Donation after Brain Death DBD or Donation after Circulatory Death DCD)
- Living – either related or unrelated

For more information see: nhsbt.nhs.uk/organ-transplantation/kidney

What is rejection?

- The body sees a kidney transplant as foreign and attacks it, which is a normal response of the body's immune system.
- Transplant rejection may be prevented by medication, but the possibility never goes away.
- The body will not adapt to the kidney, nor will the kidney change to accommodate the body, but rejection is less of a problem after the first 3-6 months, provided medication is taken consistently and never stopped for as long as the transplant is functioning.

Strategies to prevent rejection

2 mechanisms:

- Reduce chances of immune cascade being triggered at the time of transplant
 - ABO blood group compatibility
 - Cross match to rule out recipient antibodies
 - HLA matching
- Suppress immune system with medication

Immunosuppressive Medications

Induction antibody

- Alemtuzumab or Basiliximab or Anti-thymocyte immunoglobulin (ATG)
- Intra-operative methylprednisolone

Oral immunosuppressants

- Calcineurin Inhibitors (Tacrolimus/Ciclosporin)
- Antiproliferative agents (Mycophenolate/Azathioprine)
- Prednisolone
- MTORs (Sirolimus)

See NICE guidance TA481
Immunosuppressive therapy for kidney transplant in adults.

Immunosuppression

- Tacrolimus/Ciclosporin are narrow therapeutic index drugs so must be prescribed by specific brand.
- Tacrolimus preparations can be twice a day or a long acting once a day preparation.
- There is no requirement for mycophenolate (either mycophenolate mofetil or sodium) or azathioprine to be prescribed by brand as they are not narrow therapeutic index drugs.

Adjunctive Therapy

- Aspirin
- Cotrimoxazole for PCP prophylaxis (if allergic, then use alternative such as dapsone, pentamidine or azithromycin)
- Protein pump inhibitor (PPI) – monitor magnesium levels, see MHRA alert, or famotidine if PPI contraindicated
- Valganciclovir/Valaciclovir for cytomegalovirus (CMV) prophylaxis
- Isoniazid (+ pyridoxine) for latent Tuberculosis (TB) prophylaxis if at high risk of previous TB exposure.
- Antihypertensives
- Cholesterol lowering drugs (atorvastatin preferred)
- Entecavir/Lamivudine for Hepatitis B prophylaxis