# Renal Transplant Medicine

What the on-call team needs · never stop the immunosuppression, and work the creatinine rise systematically

**Call the** *transplant center*

## ⚠ TWO RULES THAT OVERRIDE ALMOST EVERYTHING ELSE

**1. Do not stop or hold immunosuppression without discussing it with the transplant center**, including when the patient is septic. Abrupt withdrawal risks rejection and graft loss, and the decision to reduce is theirs to make with you. **2. Check every new drug for a calcineurin inhibitor interaction before prescribing it.** A single course of the wrong antibiotic or antifungal can double or halve the tacrolimus level within days.

## THE REGIMEN *induction at implant, then lifelong maintenance*

| Component | Detail |
|---|---|
| **Induction** | Given at transplant: **basiliximab** (IL-2 receptor antagonist) for lower-risk recipients, or **antithymocyte globulin** for higher immunological risk |
| **Maintenance, the usual triple** | **A calcineurin inhibitor (tacrolimus, sometimes cyclosporine) plus an antimetabolite (mycophenolate) plus low-dose prednisone.** Some regimens use an mTOR inhibitor such as sirolimus, or belatacept |
| **Tacrolimus is narrow therapeutic index** | **Trough levels guide dosing** and the target falls over time since transplant. **Too low means rejection, too high means nephrotoxicity, neurotoxicity, tremor, diabetes and hyperkalemia.** Note the drug that saves the graft is also nephrotoxic, which is why an unexplained creatinine rise is not automatically rejection |
| **⚠ CYP3A4 interactions** | **Levels RISE with** azole antifungals (fluconazole, voriconazole), macrolides (clarithromycin, erythromycin), diltiazem, verapamil, protease inhibitors and grapefruit. **Levels FALL with** rifampin, phenytoin, carbamazepine and St John's wort. **Azithromycin is the safer macrolide.** Check levels within days of any change |

## THE INFECTION TIMELINE *time since transplant narrows the differential faster than anything else*

| Period | What to expect | Notes |
|---|---|---|
| **Under 1 month** | **Conventional nosocomial and surgical infections**: wound, urinary, line, pneumonia, *C. difficile*, plus donor-derived infection | Opportunistic infection is unusual this early, because the cumulative immunosuppression has not yet built up |
| **1 to 6 months** | **The classic opportunistic window**: **CMV**, **Pneumocystis**, **BK virus**, EBV, listeria, nocardia, aspergillus, reactivated tuberculosis | This is when prophylaxis is doing the most work, and when its absence shows |
| **Beyond 6 months** | **Community-acquired infections** predominate, plus late CMV and BK, and chronic viral disease | Patients with ongoing heavy immunosuppression or rejection treatment stay in the opportunistic window for longer |
| **Prophylaxis to expect** | **Trimethoprim-sulfamethoxazole** for Pneumocystis, typically 6 to 12 months, which also covers some urinary pathogens, toxoplasma and nocardia. **Valganciclovir** for CMV in at-risk serostatus combinations, most importantly **donor positive into recipient negative**. Antifungal and antiviral prophylaxis per local protocol | |

## THE RISING CREATININE *the commonest reason you will be called, worked in order*

| Cause | How to sort it out |
|---|---|
| **1. Prerenal and volume** | Dehydration, diarrhea, over-diuresis, hypotension. **The transplant kidney is denervated and a solitary functioning organ**, so it tolerates hypovolemia poorly. Review NSAIDs, ACE inhibitors and ARBs |
| **2. Obstruction** | **Ultrasound with Doppler early**: it excludes hydronephrosis, lymphocele and a perinephric collection, and assesses arterial and venous flow. Transplant **renal artery stenosis** presents with a rising creatinine and refractory hypertension |
| **3. Calcineurin inhibitor toxicity** | **Check the tacrolimus level**, and review every recent drug change. This is dose-dependent and reversible, and is the reason a high level matters as much as a low one |
| **4. Rejection** | **Acute cellular or antibody-mediated.** Often silent now, so it is **diagnosed by biopsy, not by clinical suspicion**. Send **donor-specific antibodies**. Treated with pulsed steroids, and antithymocyte globulin, plasma exchange or IVIG depending on type. **Risk rises sharply with non-adherence**, so ask about missed doses without judgment |
| **5. BK virus nephropathy** | **Screen with plasma BK PCR.** The key point is counterintuitive: **treatment is REDUCING immunosuppression**, the opposite of rejection, and the two can look identical on creatinine alone. **This is exactly why the biopsy matters** |
| **6. Recurrent or de novo disease** | The original disease can return in the graft, particularly **FSGS**, IgA nephropathy and membranous nephropathy. Check the urine protein |

## THE EARLY POST-OPERATIVE PROBLEMS *mostly surgical, and mostly found on the ultrasound*

### DELAYED GRAFT FUNCTION

Dialysis needed in the first week, usually **acute tubular necrosis** from ischemia-reperfusion. Commoner with deceased-donor and prolonged cold ischemia. **Support and wait**, but biopsy if it persists, because **rejection hides inside delayed graft function**.

### UROLOGIC

**Ureteral leak** (fluid collection, rising creatinine, low urine output) and **ureteral stricture**, typically ischemic at the distal ureter. **Check the drain fluid creatinine against serum**: a much higher value proves urine. **Lymphocele** can compress the ureter weeks later.

### VASCULAR

**Renal vein or artery thrombosis** causes **sudden anuria with graft pain and tenderness**, and is a surgical emergency with a short window to salvage. **Doppler ultrasound immediately** for any abrupt loss of urine output.

## LONG-TERM CARE & PEARLS

- **Cancer is a leading long-term cause of death. Skin cancer** is dramatically increased, so annual dermatology review and rigorous sun protection are standard. **Post-transplant lymphoproliferative disorder** is EBV-driven, highest in EBV-negative recipients, and its first treatment is **reducing immunosuppression**.
- **Cardiovascular disease is the other leading killer.** Treat lipids, blood pressure and diabetes actively, and note **post-transplant diabetes** is common and driven by tacrolimus and steroids.
- **Live vaccines are contraindicated** after transplant, so give them before it where possible. Inactivated vaccines including influenza, COVID-19 and recombinant zoster are recommended and often need extra doses for adequate response.
- **A febrile transplant recipient can look deceptively well**, because immunosuppression blunts the inflammatory response and steroids suppress fever. **Take a low threshold to culture, image and admit**, and involve the transplant center early rather than after deterioration.

**References:** KDIGO clinical practice guideline for the care of kidney transplant recipients · AST Infectious Diseases Community of Practice guidelines · standard transplant pharmacology references on calcineurin inhibitor interactions.

*Educational aid; verify against current guidance, local formulary and patient factors.*