

Shared Care of Kidney Transplant Patient

Patient name: _____

Date of birth: _____

Date of transplant: _____

We are pleased to inform you that our mutual patient received a kidney transplant at St. Michael's Hospital. We recognize that healthcare providers range in experience in providing care for kidney transplant patients, so we would like to give you some information about our program. This includes information about blood tests, medications, vaccines, and some common issues that our mutual patient may encounter after receiving a kidney transplant.

We look forward to co-managing this patient with you.

Caring for kidney transplant patients

We ask that you continue to be the first point of care for most issues, including routine primary care, vaccines, bone health, and cancer screening. Our role at the transplant program will be to manage transplant-related issues, such as managing immunosuppressive medications and their side effects, infections, and complications.

There will be some overlap between us. For example, if you find our patient to have elevated blood pressure, please address it at the time rather than waiting for the patient's next transplant clinic visit. Please feel free to contact us if you have any questions or concerns.

Blood tests

Patients are followed closely by the transplant clinic in the early period post-transplant surgery. Monitoring becomes less frequent over time. We have attached our blood test and clinic schedule for your reference.

We routinely monitor CBC, electrolytes, creatinine, liver function tests, immunosuppressant drug levels, and for certain viral infections.

Transplant clinic visits

Most serious issues usually occur within the first few months after transplant, such as complications from surgery and managing side effects from medications. After each visit, we will send you a letter, which includes a medication list, latest blood test results, issues addressed at the visit, and recommendations for follow-up.

Medications

Most kidney transplant patients are started on two or three immunosuppressive medications, an antibiotic, and a PPI. In the first year post-transplant, medications and doses are adjusted frequently.

The most common anti-rejection medications we prescribe are listed below:

Common medications	Medication class	Duration
Tacrolimus Extended Release (Advagraf®, generics) or Tacrolimus Prolonged Release (Envarsus®) or Tacrolimus Immediate Release (Prograf®, generics) <i>*note: these brands are NOT interchangeable</i>	Calcineurin inhibitor	Lifelong
Cyclosporine (Neoral®)		
Mycophenolate	Anti-proliferative	
Azathioprine		
Prednisone	Corticosteroid	

Medications which are commonly prescribed as adjunct therapies include:

Common medications	Indication	Duration
Pantoprazole (Pantoloc®, generics)	GI prophylaxis while on high-dose prednisone	3 months
Sulfamethoxazole/Trimethoprim (Septra®, Bactrim®, generics)	PJP prophylaxis	3x per week for 1 year
Valganciclovir (Valcyte®)	CMV prophylaxis	3-6 months depending on risk category

Drug interactions

Calcineurin inhibitors (tacrolimus and cyclosporine) are **prone to interactions with other drugs**. Medications that increase or decrease tacrolimus and cyclosporine blood levels can lead to **serious toxicities or increased risk of rejection**, respectively. Medications associated with nephrotoxicity (e.g. NSAIDs and COX-2 inhibitors) should also be avoided. Please see the list attached for the *most common drug-drug interactions on page 5*.

Interactions with foods and herbals

Patients are advised to avoid grapefruit or pomelo in any form while taking tacrolimus, cyclosporine, or sirolimus, as they can lead to increased drug levels and toxicity. Patients should avoid St. John's Wort, as it can reduce drug levels and increase the risk of rejection.

In general, patients should avoid all natural health products (i.e. herbal medications, or nutritional supplements, or food/plant extracts) unless *by exception* after discussing with our transplant pharmacist. Patients are instructed to call our transplant clinic to speak with our pharmacist regarding any natural health products they are considering to take.

Disability & Medication coverage

Many patients experience disability benefits, employment, or medication coverage issues. Some patients received Ontario Disability Support Program (ODSP) benefits before transplant, and may experience a change in status when they receive a transplant. We ask that you complete any forms required for routine ODSP Medical Reviews. We are only able to comment on kidney function.

Common issues in kidney transplant patients

- Cardiovascular disease, dyslipidemia, hypertension
- Diabetes: new-onset diabetes or increased medication requirements
- Gout: avoid NSAIDs & COX-2 inhibitors; **allopurinol/febuxostat are contraindicated if patient is taking azathioprine**
- Infections
 - Bacterial: UTIs (treatment is typically only indicated if patient is symptomatic)
 - Fungal: thrush, candidiasis, PJP pneumonia
 - Viral: shingles, HSV, HPV, CMV infection
- Malignancy: skin cancers, lymphoma
- Mental health concerns: anxiety, depression, irritability/mood swings, insomnia
- Osteoporosis: recommend bone mineral density tests every 2 years or as needed
- Weight gain & obesity

Sexual Function & Fertility

Females of childbearing age are advised to wait one year after transplant prior to conceiving. Mycophenolate is considered a teratogen, and all females of child-bearing age who are taking this medication should be on effective contraception (i.e. IUD or hormonal plus barrier). When planning for pregnancy after the first year, medication changes may be required, and the patient will require close monitoring and follow up by the transplant clinic.

Preventative care

- Annual physical exam
- Bone density as per local guidelines and individual fracture risk
- Cancer screening
 - Annual skin and lip exam, due to high incidence and mortality of skin cancers post-transplant. Consider dermatology referrals for suspicious lesions.
 - Non-skin cancer screening as per local guidelines for the general population

Immunizations

Timing of vaccinations:

- Annual influenza vaccine: Wait until 1 month post-transplant
- COVID vaccines: Wait until 3 months post-transplant
- All other vaccines: Wait until 6 months post-transplant (**live vaccines are NOT permitted**)

We recommend:

- Annual influenza vaccine – the type of vaccine selected should be based on age
- Staying up to date with COVID vaccines
- Pneumonia vaccines – as per NACI guidelines
- Shingles vaccine (Shingrix®) – if not already received prior to transplant
Consider immunizing individuals who received Zostavax II® prior to transplant. Wait until 12 months post-transplant. (Note: rapidly declining effectiveness of Zostavax II® one year after vaccination). DO NOT administer Zostavax II®.

For a more comprehensive list of vaccines considered safe after transplant, please see the list attached.

If you have any questions or concerns, please feel free to contact us. Our office is open Monday – Friday, 8:00am – 3:30 pm.

Sincerely yours,



Dr. Ramesh Prasad



Dr. Jeffrey Zaltzman



Dr. Darren Yuen



Dr. Ann Young



Tess Montada-Atin NP

Common Drug Interactions

The table below outlines some major drug interactions, but it is not all-inclusive. The majority of interactions are the result of effects on CYP3A drug metabolizing enzymes. Medications included below **should be avoided when an appropriate alternative exists**. If no alternatives are available, please advise the transplant clinic so that the appropriate monitoring and dose adjustments can be arranged or advised. If you have any questions, please call the Transplant Clinic.

Category	Drug	Interaction	Clinical Comments
Anticonvulsants	Carbamazepine	↓ CSA/TAC/sirolimus levels, increased risk of rejection	Monitor CSA/TAC/sirolimus levels, dose adjustments required
	Phenobarbital		
	Phenytoin	Additive gingival hyperplasia (cyclosporine only)	Good dental/oral hygiene with regular dentist visits
Antibiotics	Aminoglycosides (amikacin, gentamicin, tobramycin)	Additive nephrotoxicity	Avoid unless benefit >> risk; Monitor serum creatinine
	Caspofungin	↓ TAC levels (tacrolimus only)	Monitor TAC level closely following addition, dose change, or discontinuation
	Clarithromycin, erythromycin	↑ CSA/TAC/sirolimus levels, increased risk of toxicity	Avoid combination due to potential for dangerously high CSA/TAC/sirolimus levels
	Rifampin, rifabutin	↓ CSA/TAC/sirolimus levels, increased risk of rejection	Consult ID physician; Monitor CSA/TAC/sirolimus levels; Dose adjustments often required
	Vancomycin	Additive nephrotoxicity	Avoid unless benefit >> risk; Monitor serum creatinine
Antifungals	Amphotericin B	Additive nephrotoxicity	Avoid unless benefit >> risk; Monitor serum creatinine
	Fluconazole	↑ CSA/TAC/sirolimus levels, increased risk of toxicity	Monitor CSA/TAC/sirolimus levels; Dose adjustments often required
	Itraconazole	↑ CSA/TAC/sirolimus levels, increased risk of toxicity	Avoid due to potential for dangerously high CSA/TAC/sirolimus levels
	Ketoconazole		

Antidepressants	Fluoxetine, fluvoxamine	↑ CSA/TAC/sirolimus levels, increased risk of toxicity	Consider alternatives (citalopram, escitalopram); Monitor CSA/TAC/sirolimus levels following addition, dose change, or discontinuation
Gout Therapies	Allopurinol and febuxostat if taking azathioprine (Imuran)	Azathioprine toxicity (leukopenia, thrombocytopenia, anemia)	DO NOT co-prescribe allopurinol with azathioprine
Cardiovascular	Diltiazem, verapamil	↑ CSA/TAC/sirolimus levels, risk of toxicity	Monitor CSA/TAC/sirolimus levels closely following addition, dose change, or discontinuation; Dose adjustments often required
	Amiodarone		
	Nifedipine (with cyclosporine)	Additive gingival hyperplasia	Avoid long-term use if possible; Good dental/oral hygiene with regular dentist visits
	Digoxin	↑ digoxin levels and half-life ↓ digoxin volume of distribution	Initiate low dose and follow up with serum digoxin levels; Closely monitor for symptoms of digoxin toxicity
GI medications	Cimetidine	↑ CSA/TAC/sirolimus levels, risk of toxicity	Monitor CSA/TAC/sirolimus levels following addition/discontinuation
HIV Protease Inhibitors	Ritonavir, nelfinavir, cobicistat	↑ CSA/TAC/sirolimus levels, risk of toxicity	Consult ID physician; Use alternate therapy
Hormones	Oral contraceptives	↑ CSA/TAC/sirolimus levels, risk of toxicity	Monitor CSA/TAC/sirolimus levels following addition/discontinuation
	Danazol		
HMG-CoA Reductase Inhibitors	Statins	↑ risk of myopathies and rhabdomyolysis	Use low doses, educate patient about myalgias, monitor LFTs
Others	NSAIDs (e.g. ibuprofen, naproxen), COX-2 inhibitors	Additive nephrotoxicity	Recommend acetaminophen for over-the-counter pain management; Topical Voltaren may be used for short periods

Vaccines considered safe to receive after transplant

- Cholera and ETEC travellers' diarrhea vaccine (*non-live: Dukoral*[®])
- COVID-19 vaccine/booster
- Haemophilus influenza type b (Hib) vaccine
- Hepatitis A vaccine
- Hepatitis B vaccine
- Herpes zoster inactivated vaccine (*non-live: Shingrix*[®])
- Human papilloma virus (HPV) 4-Valent vaccine (*Gardasil*^{®9})
- Influenza (non-live) vaccine (flu shot)
- Japanese encephalitis (non-live)
- Meningococcal quadrivalent conjugate vaccine (*Menactra*[®])
- Pneumococcal conjugate 13 valent (Pevnar 13[®])
- Pneumococcal conjugate 15 valent (Vaxneuvance[®])
- Pneumococcal conjugate 20 valent (Pevnar 20[®])
- Pneumococcal polysaccharide (Pneumovax 23[®])
- Polio (inactivated) vaccine
- Rabies vaccine
- RSV vaccine
- Tetanus, Diphtheria, Pertussis vaccine (Tdap – Boostrix[®] or Adacel[®])
- Typhoid (inactivated) vaccine

Live vaccines are NOT permitted after transplant.

For all other vaccines, please see Health Canada's Canadian Immunization Guide, Immunization of immunocompromised persons.

Post-Transplant Clinic and Blood Test Schedule

Clinic visits

Time after transplant	How often
Discharge – 1 month	Weekly
1 – 2 months	Every 2 weeks
2 – 4 months	Monthly
Visit at 6 months	
6 months – 1 year	Every 3 months
1 – 2 years	Every 6 months
2 years on	Yearly and as needed

Blood tests

Time after transplant	How often
Discharge – 3 months	2 times per week (avoid Fridays)
3 - 6 months	Weekly
6 – 9 months	Every 2 weeks
9 months – 12 months	Monthly
1 – 2 years	Every 2 months
2 years on	Every 3 months

BK virus screening

Time after transplant	How often
Discharge – 3 months	Monthly
3 months – 2 years	Every 3 months
2 years on	Yearly