Derriford Hospital
Renal Transplant Information Pack

A Guide for the General Practitioner

A brief introduction and purpose of this handbook

Contents list

Referring Patients Back To The Hospital

In order to encourage renal transplant patients to be involved in their own care, we have incorporated in their discharge package some written guidelines of the symptoms that may indicate problems with their transplanted kidney.

Because rejection may present with various and often non-specific symptoms, we encourage patients to seek medical advice if they:

- Have flu-like symptoms, aches, pains, or pyrexia persisting for longer than 24 hours. In transplant patients, a temperature of 37.3 or above can be regarded as significant pyrexia.
- Experience diarrhoea or vomiting (which could potentially deplete their circulating volume and jeopardise renal function).
- Have any symptoms suggestive of urinary tract infection.
- Any pain specifically over the transplant kidney and / or oliguria is always an indication for considering an urgent referral to the hospital.

The transplant nursing team are the first line of contact for any transplant-related queries between the hours of 08.30am and 16.30pm, and can be contacted on the numbers below.

Role	Telephone number:
Transplant Nurse Specialist/Practitioner	01752 437145
Transplant Appointments	01752 439956
Live Donor Transplant Coordinator	01752 439955
Renal Pharmacist	0845 155 8155 Ext: 85169
Transplant Administrator	01752 439957

For out of hours queries, please contact **Mayflower Ward (Derriford Hospital) on 01752 431485**. On-call renal registrar or consultant is always available through the ward or via the switchboard.

Follow Up Care For Renal Transplant Patients

In the early period following a renal transplant, regular attendance at the transplant clinic is required. As graft function stabilises and maintenance immunosuppression drug therapy is well-established, these appointments become less frequent.

Usual frequency of outpatient appointments is as follows:

Month 1 -2	twice per week
Month 3-4	weekly
Month 5-6	fortnightly
Month 7-12	monthly
Month 12 onwards	every 3 months (average)

A drop in clinic is available to all transplant patients weekdays. We are happy to receive direct queries from the patient, their Practice Nurse, or the General Practitioner, whichever is the most convenient or appropriate.

For out of hours queries please contact **Mayflower ward on 01752 431485**

GP Correspondence

Letters will be written to the General Practitioner surgeries as follows:

- The transplant secretary will inform your surgery of your patient's successful transplant.

- Following discharge a Transplant Information Pack will be sent to your surgery to provide information regarding the long term follow of a kidney transplant patients and their medication.

- An electronic discharge summary from the Consultant team will be sent at the point of patient's discharge.

- Year 1 - Clinic letters will be sent at least every 3, 6 and 12 months, and whenever a change in management occurs.

- Year 2 onwards – following each clinic review.

Immunosuppressant Therapy

This section details currently used immunosuppressants and their drug interactions. At the South West Transplant Centre (SWTC), triple maintenance immunosuppression is used for most patients using tacrolimus, mycophenolate and prednisolone. Ciclosporin is now generally used as a second line drug when there are problems with tacrolimus.

All patients who have a functioning transplant will require immunosuppressive therapy for life, supply of these medications should be obtained from the hospital. To reduce the risk of medication interactions being missed and to ensure full information on medication is transferred across interfaces all medications that a patient is prescribed should be listed on the GP system. There have been incidents where drug interactions have not been picked up because the medication prescribed by the hospital was not on the GP practice system. This is particularly relevant with renal transplant medicines such as tacrolimus and ciclosporin

Ideally, the drug issued by an outside source should be listed on the patient's repeat prescription list with a note to say "for information only – issued and supplied by (e.g. hospital). We recommend that it is not added to the acute list since in most clinical systems it will "drop off" the list after a certain length of time.

Tacrolimus (Adoport)

For the tacrolimus brand, patients should divide their daily amount of tacrolimus into 2 doses, which should be taken approximately 12 hours apart. Fatty foods reduce the absorption of tacrolimus. Tacrolimus can be taken with a light breakfast, i.e. cereal or toast, but should be 2 to 3 hours after their main meal, so we usually advise taking it in the morning with their other tablets and then last thing at night, at approximately 10pm. The capsule should be swallowed whole with plenty of water. Grapefruit, or grapefruit juice,

must be avoided, as this can increase tacrolimus blood levels (other fruit juices are acceptable).

The formulations of tacrolimus (immediate release, prolonged release and granules) are not interchangeable, switching between the different formulations of oral tacrolimus requires careful therapeutic monitoring and the close supervision of a transplant specialist. Unsupervised formulation / dose changes can lead to under or overdosing of tacrolimus and risks transplant rejection and adverse reactions respectively.

The dose will be established and reviewed by the SWTC and will reflect the patients risk of rejection, weight, phase of immunosuppression, therapeutic drug monitoring and general condition.

On clinic days, patients will be instructed to delay their morning dose until a blood test has been performed. If a patient misses a dose and there is at least six hours before the next dose is due, then the missed dose can be taken. However, if there are less than six hours before the next dose is due, then the 'missed' dose should be omitted and the next dose taken as normal (do not double up). Missing one dose should not be a significant risk to the patient, but in general, it is very important that the patient takes their immunosuppression as advised to prevent acute rejection.

Whilst the Adoport brand is our first line there are patients still taking the Prograf brand. The modified release brands (Advagraf and Envarsus) are also prescribed for some patients and these should be taken once every 24 hours.

Administration:
Neoral is available as 10mg, 25mg, 50mg and 100mg capsules and also as a liquid. The capsules contain alcohol and should be swallowed whole with water or orange juice. The liquid has a strong taste and should be mixed with a glass of water or fruit juice and drunk immediately. The liquid should also be stored between 15-30^{o}C however long periods of greater than a month stored at less than 20 ^{o}C can cause the liquid to solidify into a jelly.

Mycophenolate (CellCept and Myfortic and Ceptava)

The usual dosage for MMF is 2g daily in divided doses and is titrated against side effects. The usual dose for Myfortic is 720mg twice daily tablets must not be cut in half and should be swallowed whole.

The most common adverse effect of mycophenolate is Gastrointestinal intolerance, (nausea, vomiting and diarrhoea). The diarrhoea is most troublesome and is very common, occurring in at least 10% of patients. This can be minimised by taking the dose with food and/or further subdividing the total dose (increasing the frequency of administration, e.g. MMF 1g twice daily changed to 500mg four times daily). Other

adverse effects include leucopenia, thrombocytopenia, anaemia and hypercholesterolaemia. Sometimes it is helpful to switch from one formulation to the other.

There are family planning issues with mycophenolate, with MHRA advising that patients (both male and female) who are sexually active and of a child bearing age should make sure that they have effective contraception, using two methods for women and one method for men. This is because there is an increased risk of spontaneous abortions and malformations; therefore any patient wishing to start or add to their family should be referred to the renal transplant team for a switch of their therapy. Women must continue to use effective contraception for 6 weeks after therapy switch whilst men must continue to use effective contraception for 3 months post therapy switch.

If a patient misses a dose and there is at least six hours before the next dose is due, then the missed dose can be taken. However, if there are less than six hours before the next dose is due, then the 'missed' dose should be omitted and the next dose taken as normal (do not double up). Missing a single dose should not prove significant, but taking immunosuppressive drugs regularly as prescribed plays a very important role in long term outcomes.

Absorption of mycophenolate is decreased when administered with antacids and cholestyramine and administration of both aciclovir and mycophenolate can lead to an increase in plasma levels of both drugs.

Azathioprine (Imuran)

Azathioprine has been largely superseded by the use of mycophenolate. The main side effects of azathioprine resulting from its mode of action include myelosuppression. This may lead to leucopenia, with an increased susceptibility to infection, thrombocytopenia with prolonged bleeding times, haemorrhage, or anaemia. Patients, therefore, require regular full blood count monitoring
Patients are usually discharged on a daily dose of 50 - 100mg (1-1.5mg/kg).
If a patient misses a dose and there is at least twelve hours before the next dose is due, then the missed dose can be taken. However, if there are less than twelve hours before the next dose is due, then the 'missed' dose should be omitted and the next dose taken as normal (do not double up). Missing a single dose should not prove significant.

Allopurinol can markedly increase blood level of azathioprine, resulting in severe bone marrow suppression. It should not be co-prescribed.

Prophylactic drugs used in transplant patients

A number of drugs may be given prophylactically to prevent unwanted side effects of transplantation, or immunosuppression. These treatments are particularly important during the first 6 months following transplantation.

Drug	Dose	Reason
Ranitidine	150mg BD	Peptic ulcer prophylaxis whilst on steroids (for first 3-6 months).
Co-trimoxazole	480mg OD	Prevention of Pneumocystis pneumonia (PSP), usually for 6 months
Isoniazid and Pyridoxine		For patients with a history of or at risk of TB, usually for 12 months.
Valganciclovir		CMV prophylaxis (6 months)
Aspirin	75mg OD	This is given initially to prevent renal vein thrombosis post-op
Atorvastatin	20mg OD	This is initiated in line with the NICE guidelines
Theical D3	One tablet OD	Whilst the patients are on high dose steroids we give them some calcium and vitamin D supplementation

Anti-Microbial Agents

Any infection or pyrexia of unknown origin in a transplant patient may represent a potentially serious problem and should be referred to or discussed with the SWTC immediately for evaluation.

Antibiotics

The following antibiotics can be prescribed when clinically indicated:

Trimethoprim
Penicillin's
Cephalosporin's
Co-trimoxazole **– patients will be on a low dose for the first 6 months**
Quinolones - eg Levofloxacin and ciprofloxacin - safe but remember combination with steroids markedly increases risk of tendon rupture.

NOTE

Erythromycin, clarithromycin and azithromycin should be avoided if possible and only prescribed following consultation with the SWTC as they interact with ciclosporin and tacrolimus.

Shingles

Shingles are caused by reactivation of the Varicella-Zoster virus, which lies dormant post exposure in childhood to "Chicken Pox". It is relatively common after a solid organ transplant; around 25-45% of patients may develop it at some stage.

The use of immunosuppression is associated with the reactivation of the virus. If a transplant patient presents at your practice with the signs and symptoms of shingles, then treatment with an antiviral should be commenced IMMEDIATELY, up to 72 hours after onset of rash will provide the most benefit, however, for immunosuppressed patient's antivirals starting a week after rash onset is still indicated. Valaciclovir 1g orally three times a day for 7 days. If lesions have not crusted by day 5 then continue until 2 days after the lesions have crusted. If eGFR 29-15ml/min then 1g TWICE daily should be prescribed, if eGFR <15ml/min then 1g ONCE daily should be prescribed. If the patient is intolerant to valaciclovir or aciclovir, advice from microbiology should be sought.

If the patient has ophthalmic involvement, rash at two separate sites, or is systemically unwell, please refer them to secondary care straight away. Patients who have never had chicken pox as a child are at greater risk of developing a severe presentation of shingles.

Patients with shingles should avoid contact with pregnant women who have never had chicken pox or young babies and if the patient has been in contact with people fitting this description then they should be contacted and medically assessed.

The vaccine that is now available for patients 70-79 years old is a live attenuated vaccine and therefore should not be administered to patients who have had a renal transplant and are taking immunosuppression.

Important Drug Interactions with Tacrolimus & Ciclosporin

Drugs that **REDUCE** blood levels of tacrolimus and ciclosporin. (**increased dose required)**	Drugs that **INCREASE** blood levels of tacrolimus and ciclosporin. **(reduced dose required)**	
Rifampicin	Nicardipine	Diltiazem
Phenytoin	Verapamil	Clotrimazole
Carbamazepine	Ketoconazole	Fluconazole
Barbiturates	Itraconazole	Cimetidine

Phenobarbitone	Erythromycin Clarithromycin Gestodene Naringenin (grapefruit juice) Protease inhibitors Ciprofloxacin (data uncertain)

Please Avoid These Drugs

Any other drugs that can alter the rate of liver metabolism may interact with tacrolimus and ciclosporin.

1) NSAIDs increase the nephrotoxicity of tacrolimus and ciclosporin and also increase the risk of GI bleeding. In general they should not be given to transplant patients.

2) Potassium-sparing diuretics and ACE inhibitors may exacerbate hyperkalaemia due to tacrolimus or ciclosporin.

Always refer to the BNF or discuss with the Transplant Unit if in doubt.

Contact us

We are never closed. The SWTC is open 24 hours, 365 days a year. A duty doctor or a renal nurse is always available to give advice or take referrals. In the event of your query not being fully answered, there is always a consultant nephrologist 'on call' to provide additional advice and information.

The unit provides a 'Shared Care' service, which is delivered by a designated team of physicians and surgeons. The team is responsible for assessments, transplant operations, immediate and long-term management, and all aspects of renal transplant care.

The clinicians working within the unit are:

Hospital Switchboard	**0845 155 8155 or 01752-202082**	
Dr I Saif Consultant Nephrologist & (Director of Transplantation)	Office Bleep/Pager Secretary	**01752 439753** **07659 589472** **01752 439052**
Mr J Barwell Consultant Vascular & Renal Transplant Surgeon & (Surgical Lead for	Office Bleep/Pager Secretary	**01752 431177** **07659 589769** **01752 431809**

Transplantation)		
Dr W Tse Consultant Nephrologist	Office Bleep/Pager Secretary	**0845 155 8155 Ext. 54480** **07659 589533** **01752 431308**
Dr P Rowe Consultant Nephrologist	Office Bleep/Pager Secretary	**01752 432192** **07659589472** **01752 439753**
Dr H Cramp Consultant Nephrologist	Office Bleep/Pager Secretary	**01752 432349** **07659 589810** **01752 439052**
Dr A Connor Renal Nephrologist	Office Bleep/pager Secretary	**01752 431280** **07659 585568** **01752 439052**
Dr A Hunt Consultant Physician & Nephrologist	Office Bleep/Pager Secretary	**01752 431239** **07659 589978** **01752 439289**
Dr D Stewart Consultant Physician & Nephrologist	Office Bleep/Pager Secretary	**01752 432068** **07659 589197** **01752 439753**
Mr J Akoh Consultant Transplant Surgeon	Office Bleep/Pager Secretary	**01752 439797** **07659 589621** **01752 792785**
Mr S Aroori HPB & Renal Consultant Surgeon	Office Bleep/pager Secretary	**01752 439905** **07659 585483** **01752 432071**
Mr D Stell Consultant Upper GI Surgeon	Office Bleep/Pager Secretary	**01752 763785** **07659 589762** **01752 432071**
Medicines Information Derriford Pharmacy	Office Email	**01752 439976** **plh-tr.medicines-information@nhs.net**
Linda Boorer Transplant Nurse Consultant	Office	**01752 437145**
Sara Stacey Live Donor Co-ordinator	Office	**01752 439955**
Leanne Savage Live Donor Co-ordinator	Office	**01752 439955**
Jeanette Tozer Transplant Nurse Specialist	Office	**01752 437146**
Phil Isaac Transplant Nurse Specialist	Office	**01752 437146**
Martine King Transplant Nurse Specialist	Office	**01752 433120**
Abigail McKay Transplant Assistant Practitioner	Office	**01752 437145**

Jill Swales Renal & Surgical Matron	Office Bleep	**01752 792984** **07659589759**