ROYAL INFIRMARY OF EDINBURGH

SIMULTANEOUS ISLET/ KIDNEY TRANSPLANTATION PROTOCOL (IN-PATIENT)

Version 2.0 Aug 2026

Beta Cell Replacement Team

1. **Pre-operative recipient work-up:**

   As per renal protocol (all patients Type 1 Diabetes):

   https://edren.org/ren/handbook/transplant-handbook/pre-op-recipient-work-up/

   - Investigations
   - Communications
   - Rhesus negative female recipients
   - Type 1 Diabetic Patients
   - Consent
   - Full history and examination

2. **Pre-operative management:**

   As per renal protocol:

   https://edren.org/ren/handbook/transplant-handbook/pre-operative-management/

   - Fasting
   - Fluid balance
   - Pre-operative dialysis
   - Pre-operative management of serum potassium
   - Medication

3. **Immunosuppression protocol:**

SIK recipients will either receive a Basiliximab or Alemtuzumab based immunosuppression regimen. The default regimen for patients is Basiliximab but Alemtuzumab may be preferred if the patient is deemed robust enough. The planned immunosuppression regime will be discussed at the MDT listing meeting and recorded on Trak. A paper note of the intended immunosuppression regime will be placed at the front of the patient's notes. The final decision will be made by the on-call and duty consultants, depending on compatibility.

ALEMTUZUMAB REGIMEN

a. Paracetamol 1g PO, 30 mins before Alemtuzumab (Campath-1H)
b. Chlorpheniramine 10mg IV, 30 mins before Alemtuzumab (Campath-1H)
c. Methylprednisolone 500mg IV, 30 mins before Alemtuzumab (Campath-1H)
d. Alemtuzumab (MabCampath)* 30mg SC (stored in Transplant fridge, 30mg/1ml vial in solution) and give SC into thighs, arms or buttocks over 1-2 minutes, **Alemtuzumab to be given in anaesthetic room once kidney has been reviewed by surgeon and deemed suitable for transplant.**
e. Post–op Mycophenolate Mofetil 500mg BD (10.00 and 22.00) – unless other specific regimen appropriate. To discuss with Transplant Team.
f. Adoport (Tacrolimus) 0.05mg/kg bd at 10.00 and 22.00. Target levels as per kidney alone transplant. (https://edren.org/ren/handbook/transplant-handbook/immunosuppression-protocol/tacrolimus-levels/)

g. No maintenance steroids.
h. **Etanercept will be given at the time of islet cell transplant and then day 3,7, and 10 post-islet transplant (see below).**

BASILIXIMAB REGIMEN

a. Methylprednisolone 500mg IV, 30 mins before Basiliximab (Simulect)
b. Basiliximab (Simulect) 20mg IV made into 50mL normal saline and infuse over 30mins (Basiliximab 20mg powder stored in Transplant fridge). Basiliximab **to be given in anaesthetic room once kidney has been reviewed by surgeon and deemed suitable for transplant.** A second dose (Basilixiimab 20mg IV) is given on day 4 post-transplant.
c. Post-op Mycophenolate Mofetil 1g BD (or 500mg BD if age >60 years) (10.00 and 22.00) . To discuss with Transplant Team.
d. Adoport (Tacrolimus) 0.05mg/kg bd at 10.00 and 22.00. Target levels as per kidney alone transplant. (https://edren.org/ren/handbook/transplant-handbook/immunosuppression-protocol/tacrolimus-levels/)
e. If no donor specific antibodies (DSA) then we will employ a steroid withdrawal approach (HARMONY): IV Methylprednisolone 500mg on day 0, then oral Prednisolone 100mg-day 1, 75mg-day 2, 50mg-day 3, then 25mg per day until day 7. Then off steroids. (https://edren.org/ren/handbook/transplant-handbook/immunosuppression-protocol/steroid-withdrawal-or-avoidance/)
f. If DSA present then consider Alemtuzumab regimen or tailored regimen in discussion with transplant team.
g. **Etanercept will be given at the time of islet cell transplant and then day 3, 7, and 10 post-islet transplant (see below).**

4. **Anti-viral prophylaxis**

All transplant recipients except CMV IgG negative recipients of CMV IgG negative donors (D-/R-) receive CMV prophylaxis with valganciclovir for 6 months. If T-Cell depleting induction [ATG/Alemtuzumab (Campath)] is used, CMV D-/R- cases will also receive 6 months valganciclovir.

The initial valganciclovir dose is dependent on renal function as shown in the table below:

Creatinine clearance (ml/min)	Prophylactic dose of valganciclovir
>40	450mg od
25 to 39	450mg every 2 days
10 to 24	450mg twice weekly

Note that our maximum dose of valganciclovir is 450mg od (even if creatinine clearance >60 ml/min).
Valganciclovir is available as 450mg tablets. The tablets should be taken with food and not broken or crushed.
FBC and LFTs must be monitored during therapy.

Pneumocystis prophylaxis: standard approach - Pneumocystis prophylaxis – edren.org.

DVT prophylaxis: Heparin 5000 units SC at anaesthetic induction and 5000 units SC bd thereafter until mobile post operatively (adhering to hospital protocol).

5. **Post-op and fluids:**

   As per renal protocol:

   https://edren.org/ren/handbook/transplant-handbook/post-op-and-fluids/

6. **Post-operative analgesia**

   Analgesia is usually by PCA morphine/Fentanyl. It is expected that patients will be managed via the renal ERAS protocol with step-down to oral analgesia on day 1:

   https://edren.org/ren/handbook/transplant-handbook/eras/

7. **In patient management:**

   As per renal protocol:

   https://edren.org/ren/handbook/transplant-handbook/in-patient-management/

8. **Preparation for Islet cell Transplant (24-48 hours post renal transplant)**

   1. Please inform Diabetes Registrar (on call up to 8pm; Mon-Fri request diabetes referral through Trak) and Nurse. Transplant Coordinator will inform Prof Forbes and Debbie Anderson
   2. Diabetes registrar to review patient and insulin sliding scale.
   3. Blood glucose monitoring probe (Libre glucose sensor) from Diabetes Specialist Nurse who will attach to patient if they don't already have one.
   4. Check clotting and FBC the day before islet cell transplant.
   5. Order islet transplant on TRAK- medical staff
   6. Repeat antibody sample for tissue typing lab day of islet transplant

9. **ISLET Transplant (24-48 hours post renal transplant):**

Nil by mouth for 2 hours pre procedure. Ensure an 18G IV cannula in large arm vein is in place. The following should be prescribed:

   1. Piperacillin/Tazobactam 4.5 gm IV 8hrly for 24 hours (only 2 doses if patient is anuric or has delayed renal graft function). Start 1-2 hours pre-transplant. If allergic to penicillin give Vancomycin 1g IV in 250ml sodium chloride 0.9% over 2 hours (one dose only, adjust dose if renal impairment) and Ciprofloxacin 400mg IV over one hour (12hrly for 24 hours (2 doses)).
   2. Etanercept 50mg (Enbrel; stored in transplant fridge as 25mg powder and solvent for solution for infusion) 50mg of Etanercept in 100ml of 0.9% Sodium Chloride given over 30 minutes for the first IV infusion given on ward 2 hours prior to going down to radiology for islet cell transplant. Further doses given s/c as described below.
   3. Chlorpheniramine 10mg IV, 30 mins before expected islet cell transplant

4. Hydrocortisone 100mg IV, 30 mins before expected islet cell transplant. This is in addition to any Prednisolone they may receive this day.

- Tacrolimus and Mycophenolate maintenance to continue as prescribed after renal transplant.
- Etanercept 25mg SC to be prescribed day 3, 7 and 10 post Islet transplant. Days 7 and 10 Etanercept dose can be given subcutaneously by patient as outpatient. For first SC dose (Day 3), patient should be taught to self- administer Etanercept using the pre-filled pens.

- **All patients to go down to Radiology with 5% glucose infusion. Additional 500ml bag of 20% glucose must be taken to radiology for treatment of hypoglycaemia. Administer 50ml 20% dextrose stat – repeat every 15 mins until BM >4mmol/L.**

10. Radiology

- Radiologist to prepare, prescribe and administer sedation.
- Surgeon to prepare and add heparin to islet bags prior to infusion (usually 35 units per kg body weight, (intraportal), into bag containing islets (not the rinse solutions)
- Surgeon check donor blood group arriving with islet cells compatible with recipient blood group

11. Post-islet cell transplant:

Observations: Temperature, heart rate, blood pressure, oxygen saturations, respirations every 15 minutes x 1 hours; then every 30 minutes x 2 hours; then every 1 hour x4 hours.

Call transplant team: (> greater than, < less than)

- Temp > 38º C.
- HR > 100 bpm or < 60 bpm.
- Systolic BP > 160 or < 100 mmHg.
- Diastolic BP > 100 or < 60 mmHg.

Activity: Bed rest for 4 hours lying on right side, then activity as tolerated.

STAT Bloods: Full clotting screen. FBC including, WBC and differential.

Doppler US: Ensure Doppler USS of liver has been arranged for within 24 hours post-procedure (fasting not necessary).

Diet: Nil By Mouth for 4 hours post-transplant, then clear fluids. If patient tolerating clear fluids they can choose from Islet Transplant Carbohydrate Restricted Menu which should have already been arranged by, Diabetes Dietitian (ext 21460). If there are any catering queries contact the catering supervisor (ext 24242) and liaise with Diabetes Dietitian (ext 21460).

Note: While Nil by Mouth patient must continue on intravenous insulin treatment with intravenous fluids as indicated overleaf.

Fluid Management post islet transplant:

Patient to be reviewed by renal registrar post procedure to manage fluid requirements.

12. Insulin Management:

Please contact on-call Diabetes registrar (Bleep #6800 via RIE switchboard) (Mon – Friday 0900-2000; Sat/Sun 0900 - 1700) or Diabetes team with any concerns.

- Throughout the kidney and islet transplant give 80% of their basal insulin dose as Lantus split into 2 doses (am, pm) alongside the Variable Rate Insulin Infusion.
- Target glucose 4 – 7 mmol/l.
- Intention: avoid stimulation of beta cells.
- Note: the islet solution contains free insulin from disrupted islets.
- CHECK Capillary glucose on patient's return to ward, then hourly for the first 48 hours. If patient fitted with continuous glucose monitor, capillary glucose readings MUST still be taken for verification of blood glucose concentrations.
- After 48 hours, check capillary glucose pre meals, two hours post meals and at bed time.

Insulin Infusion Instructions for First 4 Hours or until eating

(GOAL: Glucose between 4 – 7 mmol/L).

- 50 units Human Actrapid made up to 50 mls 0.9% sodium chloride (= 1 unit/ml) – see adult variable rate intravenous insulin prescribing chart on islet transplant alone protocol.
- Continue 0.45% sodium chloride / 5% glucose 500ml infusion as previously until drinking
- Continue 5% glucose 500ml infusion with 20 mmol of KCl at 50ml/hr or 100 ml/hr (Discuss with diabetologist, appropriate glucose concentration and rate) for first 8 hours, or until eating, whichever is sooner
- Check blood glucose hourly but every 15 minutes if glucose <4mmol/L* until glucose >4mmol/L

*If glucose <4mmol/L, switch insulin off, administer 100ml 10% dextrose stat – repeat every 15 mins until blood glucose >4mmol/L. If patient is NOT Nil By Mouth give 5 dextrose tablets or 100ml lucozade.

Note: If the blood glucose ≥ 14mmol/l, the glucose infusion should be deferred until the intravenous insulin has lowered the blood glucose to <14 mmol/l. Ketones should also be checked and if they are over 1.0mmols, please contact Diabetes Team.

Note: The insulin and glucose infusions are given through the same IV cannula, with a non-returning valve.

Subcutaneous Insulin Instructions ONCE EATING (GOAL: Glucose between 4 – 7 mmol/L):

Continue hourly blood glucose monitoring and intravenous insulin scale until reviewed by Diabetes Team.

Once eating, discontinue intravenous glucose

Re-commence basal insulin, or if patient on a pump, CSII may be restarted.

Administer subcutaneous insulin based on pre-meal capillary glucose readings and carbohydrate load (approx.30-35G carbohydrate or snack of 15G or 0G carbohydrate).

Note: patients will have a particular ratio of amount of insulin required per 10G carbohydrate (please discuss with Diabetes Dietitian /Diabetes Specialist Nurse).

Note: The amount of insulin required for a carbohydrate restricted meal is individualised to the patient, reflecting amount needed to cover amount of carbohydrate as well as the amount needed to correct the glucose reading to a target value of 6 mmol/L

If patient was on metformin do not start until at least 48 hours post-procedure. Ensure eGFR > 40 mmol/l, serum creatinine<150umol/l.

13. BLOOD PRODUCTS

Irradiated blood products are **not** required if blood products are needed, including post-alemtuzumab.

14. DISCHARGE

On discharge the patient will be provided with a sheet containing:

1. Subcutaneous insulin regimen
2. Medication booklet including immunosuppression schedule.
3. Follow up appointments for the Monday Beta cell replacement clinic (to liaise with Beta Cell Transplant coordinators).
4. Renal transplant follow-up, as per local renal transplant follow-up protocol.
5. General Health Care Advice in relation to transplant and immunosuppression.