

Changes in this version

- Change of 'Multivisceral' to 'Multi-visceral' throughout the document
 - Change from 'National' to 'Intestinal' Transplant List
 - Change of final approval of the policy from TPRC to OTDT CARE
- Addition of wording at section 3.1 to state 'patient cases to be discussed at' the NASIT forum before being listed for transplantation.
 - Standardised list of intestinal failure diseases added to the policy as an Appendix
- Mention of hepatoblastoma patients as cases that need to go through the Appeals Panel for registration
- Data correction for patients registered for a multi-visceral transplant but transplanted with an isolated liver

Policy

This policy has been created by the [Multi-visceral & Composite Tissue Advisory Group](#) (formerly [Bowel Advisory Group](#)) on behalf of NHSBT.

This policy previously received approval from the [Transplant Policy Review Committee \(TPRC\)](#). This committee was disbanded in 2020 and the current governance for approval of policies is now from [Organ and Tissue Donation and Transplantation Clinical Audit Risk and Effectiveness Group \(OTDT CARE\)](#), which will be responsible for annual review of the guidance herein.

Last updated: April 2021

Approved by OTDT CARE: April 2021

The aim of this document is to provide a policy for the selection of adult and paediatric patients on to the UK [Intestinal](#) Transplant List and, where necessary, criteria for their de-selection. These criteria apply to all proposed recipients of organs from deceased donors.

In the interests of equity and justice all centres should work to the same selection criteria.

Non-compliance to these guidelines will be handled directly by NHSBT, in accordance with the *Non-Compliance with Selection and Allocation Policies*

<http://www.odt.nhs.uk/transplantation/tools-policies-and-guidance/policies-and-guidance/>

It is acknowledged that these guidelines will require regular review and refreshment. Where they do not cover specific individual cases, mechanisms are in place for selection of exceptional cases.

1. Conditions that are considered for transplantation

There is a high mortality on intestinal transplant lists both in adults and in children², mostly due to end-stage intestinal failure-associated liver disease. The timing of referral for intestinal transplantation must be decided on a case-by-case basis. It is, however, recommended that adults and children with irreversible intestinal failure who develop complications should be discussed with an intestinal transplant centre *before* life-threatening complications develop.^{3,4} Pre-operative comorbidity has a profound influence on post-operative survival.⁵ The generally accepted guidelines for transplantation have been previously published⁶ and are now to be updated.

1.1. Irreversible intestinal failure, plus

1.1.1. Life-threatening complications of parenteral nutrition

- a) Progressive intestinal failure-associated liver disease (IFALD) or non-IFALD despite all remedial actions
 - Objective evidence of liver disease judged by biochemistry and biopsy
 - Combined intestinal and liver transplant (rather than isolated intestinal transplantation) is best considered in the presence of advanced liver disease (portal hypertension or advanced fibrosis)
- b) Severe sepsis
 - More than one life-threatening episode of catheter-related sepsis for which no remediable cause can be identified by a recognised intestinal failure centre
 - Endocarditis or other metastatic infection
- c) Limited central venous access
 - Venous access limited to three major conventional sites in adults (above and below the diaphragm) and two major conventional sites above the diaphragm in children
 - Conventional central venous sites are defined as internal jugular, subclavian and femoral veins

1.1.2. Very poor quality of life thought likely to be correctable by transplantation

1.2. Patients with indications for extensive surgery involving partial or complete evisceration

1.2.1. Surgery to remove a large proportion of the abdominal viscera which is considered untenable without associated **multi-visceral** transplantation/isolated small bowel transplantation (e.g. extensive desmoid disease, extensive severe mesenteric arterial disease requiring intervention)

1.2.2. Localised malignancy considered amenable to curative resection which would necessitate extensive evisceration (e.g. localised neuroendocrine tumours). Particular caution should be exercised in this group and patients should be discussed in a multi-disciplinary multicentre forum (e.g. National Adult Small Intestinal Transplant forum, NASIT).

1.3. Patients requiring transplantation of other organs where exclusion of simultaneous intestinal transplantation would adversely affect patient survival

1. Where the transplantation procedure is expected to preclude the possibility of future intestinal transplantation (e.g. loss of venous access or further human leukocyte antigen sensitisation)
2. Where the need for subsequent intestinal transplantation is considered likely and the risk of death is increased by excluding the intestine from the graft
Examples include predictable problems related to administering immunosuppression (e.g. line sepsis), or continuing severe intestinal disease such as diabetic visceral neuropathy, or ultra-short bowel syndrome, which may cause fluid, electrolyte and acid base balance problems that would damage an existing or planned renal graft

1.4. Inclusion of a renal graft at the time of intestinal or multi-visceral transplantation

Deterioration in renal function is expected following intestinal transplantation and studies suggest a fall to 43% of pre-operative glomerular filtration rate (GFR) can be expected 2 years after transplantation, and this is greater in those with cumulative tacrolimus levels >4500 ng/day/mL, at 34% of pre-transplant GFR.⁷ Therefore, patients with moderately impaired renal function can be expected to develop significant dysfunction over the first 2 years. This can seriously affect their survival as many have very poor venous access which will not support renal replacement therapy. Adults are particularly prone to renal deterioration whereas children are less affected.⁸ It is recommended that adults with corrected GFR of <45 ml/min/m² are evaluated for the possibility of simultaneous renal transplantation. This should also be considered for children with impaired renal function although as the expected deterioration is less, the nGFR threshold for transplantation may be lower.

2. Assessment of patients

It is essential to be certain that the patients/parents have been fully informed and understand their options. This includes making sure that the patients/parents have the mental disposition and capacity to fully appreciate the options and consequences of their decision. Patients/parents should always be assessed by a psychiatrist/psychologist for mental competence and should be made aware of the general global survival figures, as well as the local centre's survival figures, rather than the results of selected well-performing centres which may be over optimistic.

3. Selection criteria

3.1. Clinical criteria for selection

Adults: The decision to list a patient for isolated intestinal or **multi-visceral** transplantation is complex and always involves assessing the relative risks of available treatment options, or continuing current treatment. Patients usually present a unique combination of unusual problems. In addition to the major indications for small intestinal transplantation itemised above, there are numerous additional factors which must be taken into account. The risk factors for surgery must be weighed against those for conservative management for each patient. Furthermore, as the transplantation procedure is modified to improve results, so the decision process will need to adapt to the new circumstances. In order to provide patients with the most appropriate advice, a national forum has been established for adults (NASIT).⁶ Potential adult candidates for transplantation are presented at the NASIT forum to a group of clinicians involved in all aspects of the process. In the UK it is a requirement from the Department of Health National Commissioning Group for **patient cases to be discussed at the NASIT forum** before being listed for transplantation.

Paediatrics: Referral to paediatric intestinal transplantation centres are made by Paediatric Gastroenterologists from regional centres all over the UK. The patient undergoes assessment at the designated paediatric centre and the decision regarding listing is made by each individual centre. No common forum (as exists for adults in NASIT) currently exists to discuss potential candidates for transplantation.

3.2. 'Super-urgent' transplantation

The need for super-urgent allocation of a multi-visceral graft containing the liver, bowel and pancreas was identified in 2012. Following this, the Bowel (now **Multi-visceral** & Composite Tissue) and Liver Advisory Groups agreed to list and prioritise patients with acute liver failure and intestinal failure or extensive porto-mesenteric venous thrombosis. These super-urgent patients have the same priority and status as current patients listed to receive emergency liver transplants for acute liver failure or acute liver graft failure, and ahead of all non super-urgent patients listed to require any type of intestine or liver containing graft. Please refer to the selection policy for liver transplantation for full details of super-urgent registration.

3.3. Contraindications

3.3.1. Absolute contraindications

- Metastatic malignant disease
- Systemic disease with a poor prognosis
- Severe neurological diseases with progressive impairment

3.3.2. Relative contraindications

- Active generalised sepsis or severe systemic infection
- Requirement for ventilator support
- Neurological diseases with permanent sequelae
- Insufficient venous access
- Systemic disease with a life expectancy <5 years
- Neoplastic disease with an uncertain prognosis
- Psychosis unlikely to respond to full treatment and result in non-adherence (for adults)
- Patients unlikely to adequately comply with post-small intestinal transplant treatment, including inadequate social support, particularly poor social circumstances, or personality disorder with 'at risk' behaviour
- Age above 60 years

3.4. Selection for re-transplant

Intestinal re-transplantation has been historically associated with a high mortality. Survival rates of 20% have been quoted in the literature. A recent report from Pittsburgh highlights improved survival (71.4%) following re-transplantation⁹. The main reasons for improved survival are thought to be related to improved patient selection and management of infectious complications in the early post-transplant period. The main indications for re-transplantation are:

Vascular thrombosis
Chronic rejection of the bowel/liver
Acute exfoliative rejection
CMV enteritis requiring graft explantation

3.5. Mandatory data for registration

Patients being registered for an elective intestinal transplant will not be registered until the following items are provided:

Recipient Details: transplant centre, recipient surname, recipient forename, NHS group status, date of birth, blood group, ethnic origin, country of residence, postcode.

Registration Details: registration status (active/suspended), organs required, paediatric donor organ required, previous transplants, primary indication for transplant – [please see Appendix](#), recipient weight, recipient height, HLA data (and any unacceptable specificities).

Investigation results pre-transplant: serum creatinine, International Normalised Ratio (INR), serum bilirubin, serum sodium.

Clinical status: patient location (outpatient/ward/ICU/HDU), restricted venous access.

4. Monitoring

Children and adults can wait for a suitable transplant for variable periods of time and they should be carefully monitored to assess progress/deterioration in the clinical condition. Close contact must be maintained between the referring centre and intestinal transplant centre on a regular basis. Intestinal rehabilitation efforts should continue whilst on the transplant list (if possible) and hence children/adults may have to be suspended if improvement in clinical condition is achieved. If there is an improvement/progression in liver disease, the type of transplant recommended may have to be altered following assessment by an experienced multidisciplinary team. Children and adults may develop further complications (venous thrombosis, life threatening line infections, progression of liver disease), which may make them unsuitable candidates for transplantation. Monitoring of patients should be individualized to each centre and each patient.

5. Appeals process

The above criteria have been agreed by the **Multi-visceral** & Composite Tissue Advisory Group (formerly Bowel Advisory Group) in order for a patient to be placed on the UK National Transplant List. It is recognised that these criteria may exclude a small group of patients who would otherwise be appropriate candidates; the purpose of the National Appeals Panel is to determine whether such excluded patients should be placed on the UK National Transplant List.

If a centre wishes to register an adult/paediatric patient for an intestinal transplant who does not satisfy the selection criteria (e.g. **hepatoblastoma cases**), a request should be made in writing to members of the National Appeals Panel.

5.1. Composition of the National Appeals Panel

The panel will consist of an independent non-voting chair and one representative from each of the four UK intestinal transplant centres. The centre proposing a case may not vote but the appeal will be allowed if two or more centres are in favour. Members of the panel will respond with a decision usually within five working days of the request. The Chair of the Appeals Panel is the Chair of the **Multi-visceral** & Composite Tissue (formerly Bowel) Advisory Group. Each centre should nominate one representative and one substitute.

6. Patients registered for a multi-visceral transplant but transplanted for an isolated liver only

Patients who are registered using the intestinal registration form but receive a liver only transplant are not able to be correctly followed up post-transplant without amending the registry to migrate their data to the liver scheme. This is actioned by the NHSBT Statistics team. Because of the steps involved, it is important that this is actioned as soon as possible after transplant, as failing to correct the data could create complications with re-registration of the patient and generate a backlog of follow-up for the transplant centre.

When a transplant like this occurs, the transplant centre will inform the Statistics team as soon as possible after the transplant, by emailing statistical.enquiries@nhsbt.nhs.uk.

The transplant centre will inform OTDT Hub Operations, at the transplant notification stage, that the patient was originally registered using the intestinal transplant registration form but transplanted for an isolated liver. Therefore, OTDT Hub Operations will not be able to find this patient on the liver waiting list.

7. Policy audit and updates

The details of any policy concerning selection and allocation will inevitably change with time. Any new versions of protocols will be updated and published only twice per year in July and January following ratification at the [Multi-visceral](#) & Composite Tissue (formerly Bowel) Advisory Group meeting. All changes to the guidance must first be agreed with the [Multi-visceral](#) & Composite Tissue (formerly Bowel) Advisory Group. Regular reports will need to be produced to assess the success or failure of any new selection, allocation and distribution policy.

7.1. Policy outcomes

The purpose of the intestinal transplant policies and guidelines is to ensure equitable access to organ transplantation in all transplant centres in the UK and the best possible outcomes when judged from the point of registration. All policies will be judged against those standards.

References

1. Intestinal Transplant Registry. www.lhsc.on.ca/itr. 2009.
2. Fryer J, Pellar S, Ormond D et al. Mortality in candidates waiting for combined liver-intestine transplants exceeds that for other candidates waiting for liver transplants. *Liver Transpl* 2003;9:748–53.
3. Fecteau A, Atkinson P, Grant D. Early referral is essential for successful pediatric small bowel transplantation: The Canadian experience. *J Pediatr Surg* 2001;36:681–84.
4. Gupte GL, Beath SV, Protheroe S et al. Improved outcome of referrals for intestinal transplantation in the UK. *Arch Dis Child* 2007;92:147–52.
5. Middleton SJ, Nishida S, Tzakis A et al. Cambridge-Miami score for intestinal transplantation preoperative risk assessment: initial development and validation. *Transplant Proc*. 2010;42:19–21.
6. Middleton SJ, Pollard S, Friend PJ, et al. Adult small intestinal transplantation in England and Wales. *Br J Surg* 2003;90:723–7.
7. Ueno T, Kato T, Gaynor J et al. Renal dysfunction following adult intestinal transplant under tacrolimus-based immunosuppression. *Transplant Proc*. 2006;38:1762–4.
8. Ueno T, Kato T, Gaynor J et al. Renal function after pediatric intestinal transplant. *Transplant Proc*. 2006;38:1759–61.
9. Mazariegos GV, Soltys K, Bond G, Girnita A, Machaidze Z, Jaffe R, Green M, Martin D, Zeevi A, Squires R, Perez G, Abu-Elmagd K, Sindhi R. Pediatric intestinal retransplantation: techniques, management, and outcomes. *Transplantation*. 2008 Dec 27;86(12):1777-82.

Appendix

If using code 24 (Cholestatic liver disease, please specify) or 98 (Other, please specify) to code the recipient's intestinal failure disease(s) or reason for re-transplantation in the Intestinal Failure Transplant Recipient Registration system, please consider using the wording from the following list of diseases to provide further details about the disease or reason for re-transplantation;

- Radiation Enteritis
- Chronic Idiopathic Intestinal Pseudo-obstruction
- Other motility disorder (no histological diagnosis)
- Pseudomyxoma Peritonei
- Other benign tumour requiring extensive evisceration
- Cirrhosis with extensive portomesenteric venous thrombosis
- Cirrhosis plus other technical reason for needing multi-visceral graft
- Acute Abdominal Catastrophe (more than just SBS)
- Non cirrhotic portal hypertension
- Requirement for Intestinal transplant to support transplantation of other solid organ, not liver (specify other organ – kidney, pancreas, other)
- Loss of central vascular access
- Recurrent Catheter-Related Bloodstream infections
- Catheter-Related Bloodstream Infection with distant abscess/seeding/endocarditis
- Intestinal Failure Associated Liver Disease – preventative
- Intestinal Failure Associated Liver Disease – cirrhosis
- Quality of Life

NHS Blood and Transplant is working to add these additional diseases to the options in the Registration system. Using the above wording while the system is upgraded will help to standardise the text that is provided by centres.