



FEP Medical Policy Manual

FEP 7.03.04 Isolated Small Bowel Transplant

Annual Effective Policy Date: January 1, 2024

Original Policy Date: March 2012

Related Policies:

7.03.05 - Small Bowel/Liver and Multivisceral Transplant

Isolated Small Bowel Transplant

Description

Description

A small bowel transplant may be performed as an isolated procedure or in conjunction with other visceral organs, including the liver, duodenum, jejunum, ileum, pancreas, or colon. Isolated small bowel transplant is commonly performed in patients with short bowel syndrome. Small bowel/liver transplants and multivisceral transplants are considered in evidence review 7.03.05.

OBJECTIVE

The objective of this evidence review is to determine whether the use of isolated small bowel transplant or retransplant improves the net health outcome in patients with intestinal failure.

POLICY STATEMENT

A small bowel transplant using cadaveric intestine may be considered **medically necessary** in adult and pediatric individuals with intestinal failure (characterized by loss of absorption and the inability to maintain protein-energy, fluid, electrolyte, or micronutrient balance), who have established long-term dependence on total parenteral nutrition (TPN) and are developing or have developed severe complications due to TPN.

A small bowel transplant using a living donor may be considered **medically necessary** only when a cadaveric intestine is not available for transplantation in an individual who meets the criteria noted above for a cadaveric intestinal transplant.

A small bowel retransplant may be considered **medically necessary** after a failed primary small bowel transplant.

A small bowel transplant using living donors is considered **not medically necessary** in all other situations.

A small bowel transplant is considered **investigational** for adult and pediatric individuals with intestinal failure who can tolerate TPN.

POLICY GUIDELINES

General Criteria

Potential contraindications for solid organ transplant subject to the judgment of the transplant center include the following:

- Known current malignancy, including metastatic cancer
- Recent malignancy with a high risk of recurrence
- Untreated systemic infection making immunosuppression unsafe, including chronic infection
- Other irreversible end-stage diseases not attributed to intestinal failure
- History of cancer with a moderate risk of recurrence
- Systemic disease that could be exacerbated by immunosuppression
- Psychosocial conditions or chemical dependency affecting ability to adhere to therapy.

Small Bowel-Specific Criteria

Intestinal failure results from surgical resection, congenital defect, or disease-associated loss of absorption and is characterized by the inability to maintain protein-energy, fluid, electrolyte, or micronutrient balance. Short bowel syndrome is 1 cause of intestinal failure.

Individuals who are developing or have developed severe complications due to total parenteral nutrition (TPN) include, but are not limited to, the following: multiple and prolonged hospitalizations to treat TPN-related complications (especially repeated episodes of catheter-related sepsis) or the development of progressive liver failure. In the setting of progressive liver failure, small bowel transplant may be considered a technique to avoid end-stage liver failure related to chronic TPN, thus avoiding the necessity of a multivisceral transplant. In those receiving TPN, liver disease with jaundice (total bilirubin >3 mg/dL) is often associated with the development of irreversible, progressive liver disease. The inability to maintain venous access is another reason to consider small bowel transplant in those who are dependent on TPN.

BENEFIT APPLICATION

Experimental or investigational procedures, treatments, drugs, or devices are not covered (See General Exclusion Section of brochure).

FDA REGULATORY STATUS

Solid organ transplants are a surgical procedure and, as such, are not subject to regulation by the U.S. Food and Drug Administration (FDA).

The FDA regulates human cells and tissues intended for implantation, transplantation, or infusion through the Center for Biologics Evaluation and Research, under Code of Federal Regulation Title 21, parts 1270 and 1271. Solid organs used for transplantation are subject to these regulations.

RATIONALE

Summary of Evidence

For individuals who have intestinal failure who receive a small bowel transplant, the evidence includes case series. Relevant outcomes are overall survival (OS), morbid events, and treatment-related mortality and morbidity. Small bowel transplant is infrequently performed, and only relatively small case series, generally single-center, are available. Risks after small bowel transplant are high, particularly related to infection, but may be balanced against the need to avoid the long-term complications of total parenteral nutrition (TPN) dependence. In addition, early small bowel transplant may obviate the need for a later combined liver/small bowel transplant. Transplantation is contraindicated in patients in whom the procedure is expected to be futile due to comorbid disease or in whom posttransplantation care is expected to worsen comorbid conditions significantly. Guidelines and U.S. federal policy no longer view human immunodeficiency virus (HIV) infection as an absolute contraindication for solid organ transplantation. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have failed small bowel transplant without contraindication(s) for retransplant who receive a small bowel retransplant, the evidence includes case series. Relevant outcomes are OS, morbid events, and treatment-related mortality and morbidity. Data from a small number of patients undergoing retransplantation are available. Although limited in quantity, the available data have suggested a reasonably high survival rate after small bowel retransplantation in patients who continue to meet the criteria for transplantation. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

SUPPLEMENTAL INFORMATION

Practice Guidelines and Position Statements

Guidelines or position statements will be considered for inclusion in 'Supplemental Information' if they were issued by, or jointly by, a US professional society, an international society with US representation, or National Institute for Health and Care Excellence (NICE). Priority will be given to guidelines that are informed by a systematic review, include strength of evidence ratings, and include a description of management of conflict of interest.

American Gastroenterological Association

In 2003, the American Gastroenterological Association (AGA) produced a medical position statement on short bowel syndrome and intestinal transplantation.³¹ It recommended dietary, medical, and surgical solutions. Indications for intestinal transplantation mirrored those of the Centers for Medicare & Medicaid Services (CMS). The guidelines acknowledged the limitations of a transplant for these patients. The statement recommended the following Medicare-approved indications, pending availability of additional data:

- "Impending or overt liver failure...
- Thrombosis of major central venous channels...
- Frequent central line-related sepsis...
- Frequent severe dehydration."

The AGA published an expert review on management of short bowel syndrome in 2022.³² Their best practice statements mirror the CMS recommendations, stating that individuals with short bowel syndrome and intestinal failure experiencing TPN complications should be referred early for intestinal transplantation consideration. They state that individuals with short bowel syndrome and intestinal failure with high morbidity or low acceptance of TPN should also be considered for early listing for intestinal transplantation on a case-by-case basis.

American Society of Transplantation

In 2001, the American Society of Transplantation issued a position paper on indications for pediatric intestinal transplantation.³³ The Society listed the following disorders in children as potentially treatable by intestinal transplantation: short bowel syndrome, defective intestinal motility, and impaired enterocyte absorptive capacity. Contraindications for intestinal transplant to treat pediatric patients with intestinal failure are similar to those of other solid organ transplants: profound neurologic disabilities, life-threatening comorbidities, severe immunologic deficiencies, nonresectable malignancies, autoimmune diseases, and insufficient vascular patency.

U.S. Preventive Services Task Force Recommendations

Not applicable.

Medicare National Coverage

The Centers for Medicare & Medicaid have a national coverage determination on intestinal and multivisceral transplantation. The determination covers these types of transplants only when performed for patients who have failed TPN and only when performed in centers that meet approval criteria.

"1. Failed TPN

The TPN delivers nutrients intravenously, avoiding the need for absorption through the small bowel. TPN failure includes the following:

- Impending or overt liver failure due to TPN induced liver injury.
- Thrombosis of the major central venous channels; jugular, subclavian, and femoral veins.
- Frequent line infection and sepsis.
- Frequent episodes of severe dehydration despite intravenous fluid supplement in addition to TPN.

2. Approved Transplant Facilities

The criteria for approval of centers will be based on a volume of 10 intestinal transplants per year with a 1-year actutimes survival of 65 percent using the Kaplan-Meier technique."³⁴

REFERENCES

1. Black CK, Termanini KM, Aguirre O, et al. Solid organ transplantation in the 21 st century. *Ann Transl Med.* Oct 2018; 6(20): 409. PMID 30498736
2. Massironi S, Cavalcoli F, Rausa E, et al. Understanding short bowel syndrome: Current status and future perspectives. *Dig Liver Dis.* Mar 2020; 52(3): 253-261. PMID 31892505
3. U. S. Department of Health and Human Services (DHHS). Organ Procurement and Transplantation Network National Data. 2023; <https://optn.transplant.hrsa.gov/data/>. Accessed June 14, 2023.
4. Sudan D. The current state of intestine transplantation: indications, techniques, outcomes and challenges. *Am J Transplant.* Sep 2014; 14(9): 1976-84. PMID 25307033
5. Ueno T, Wada M, Hoshino K, et al. Impact of intestinal transplantation for intestinal failure in Japan. *Transplant Proc.* 2014; 46(6): 2122-4. PMID 25131121
6. Benedetti E, Holterman M, Asolati M, et al. Living related segmental bowel transplantation: from experimental to standardized procedure. *Ann Surg.* Nov 2006; 244(5): 694-9. PMID 17060761
7. Sudan D. Long-term outcomes and quality of life after intestine transplantation. *Curr Opin Organ Transplant.* Jun 2010; 15(3): 357-60. PMID 20445450
8. Lacaille F, Irtan S, Dupic L, et al. Twenty-eight years of intestinal transplantation in Paris: experience of the oldest European center. *Transpl Int.* Feb 2017; 30(2): 178-186. PMID 27889929
9. Garcia Aroz S, Tzvetanov I, Hetterman EA, et al. Long-term outcomes of living-related small intestinal transplantation in children: A single-center experience. *Pediatr Transplant.* Jun 2017; 21(4). PMID 28295952
10. Dore M, Junco PT, Andres AM, et al. Surgical Rehabilitation Techniques in Children with Poor Prognosis Short Bowel Syndrome. *Eur J Pediatr Surg.* Feb 2016; 26(1): 112-6. PMID 26535775
11. Rutter CS, Amin I, Russell NK, et al. Adult Intestinal and Multivisceral Transplantation: Experience From a Single Center in the United Kingdom. *Transplant Proc.* Mar 2016; 48(2): 468-72. PMID 27109980

12. Lauro A, Zanfi C, Dazzi A, et al. Disease-related intestinal transplant in adults: results from a single center. *Transplant Proc.* 2014; 46(1): 245-8. PMID 24507060
13. Matarese LE, Costa G, Bond G, et al. Therapeutic efficacy of intestinal and multivisceral transplantation: survival and nutrition outcome. *Nutr Clin Pract.* Oct 2007; 22(5): 474-81. PMID 17906271
14. Vianna RM, Mangus RS, Tector AJ. Current status of small bowel and multivisceral transplantation. *Adv Surg.* 2008; 42: 129-50. PMID 18953814
15. Wu GS, Cruz RJ, Cai JC. Acute antibody-mediated rejection after intestinal transplantation. *World J Transplant.* Dec 24 2016; 6(4): 719-728. PMID 28058223
16. Florescu DF, Qiu F, Langnas AN, et al. Bloodstream infections during the first year after pediatric small bowel transplantation. *Pediatr Infect Dis J.* Jul 2012; 31(7): 700-4. PMID 22466325
17. Florescu DF, Langnas AN, Grant W, et al. Incidence, risk factors, and outcomes associated with cytomegalovirus disease in small bowel transplant recipients. *Pediatr Transplant.* May 2012; 16(3): 294-301. PMID 22212495
18. Florescu DF, Islam KM, Grant W, et al. Incidence and outcome of fungal infections in pediatric small bowel transplant recipients. *Transpl Infect Dis.* Dec 2010; 12(6): 497-504. PMID 20626710
19. Calvo Pulido J, Jimnez Romero C, Morales Ruz E, et al. Renal failure associated with intestinal transplantation: our experience in Spain. *Transplant Proc.* 2014; 46(6): 2140-2. PMID 25131125
20. Boyer O, Noto C, De Serre NP, et al. Renal function and histology in children after small bowel transplantation. *Pediatr Transplant.* Feb 2013; 17(1): 65-72. PMID 22882667
21. Fujimoto Y, Uemoto S, Inomata Y, et al. Living-related small bowel transplant: management of rejection and infection. *Transplant Proc.* Feb 1998; 30(1): 149. PMID 9474986
22. Gruessner RW, Sharp HL. Living-related intestinal transplantation: first report of a standardized surgical technique. *Transplantation.* Dec 15 1997; 64(11): 1605-7. PMID 9415566
23. Jaffe BM, Beck R, Flint L, et al. Living-related small bowel transplantation in adults: a report of two patients. *Transplant Proc.* May 1997; 29(3): 1851-2. PMID 9142299
24. Tesi R, Beck R, Lambiase L, et al. Living-related small-bowel transplantation: donor evaluation and outcome. *Transplant Proc.* 1997; 29(1-2): 686-7. PMID 9123480
25. Colfax G. HIV Organ Policy Equity (HOPE) Act Is Now Law. 2013; <https://obamawhitehouse.archives.gov/blog/2013/11/21/hiv-organ-policy-equity-hope-act-now-law>. Accessed June 14, 2023.
26. United Network for Organ Sharing (UNOS). OPTN policies, procedures implemented to support HOPE Act. 2015; <http://www.unos.org/optn-policies-procedures-implemented-to-support-hope-act/>. Accessed June 14, 2023.
27. Organ Procurement and Transplantation Network (OPTN). Organ Procurement and Transplantation Network Policies. 2023; https://optn.transplant.hrsa.gov/media/1200/optn_policies.pdf. Accessed June 14, 2023.
28. Working Party of the British Transplantation Society. *Kidney and Pancreas Transplantation in Patients with HIV. Second Edition (Revised).* British Transplantation Society Guidelines Macclesfield, UK: British Transplantation Society; 2017.
29. Desai CS, Khan KM, Gruessner AC, et al. Intestinal retransplantation: analysis of Organ Procurement and Transplantation Network database. *Transplantation.* Jan 15 2012; 93(1): 120-5. PMID 22113492
30. Abu-Elmagd KM, Costa G, Bond GJ, et al. Five hundred intestinal and multivisceral transplantations at a single center: major advances with new challenges. *Ann Surg.* Oct 2009; 250(4): 567-81. PMID 19730240
31. American Gastroenterological Association. American Gastroenterological Association medical position statement: short bowel syndrome and intestinal transplantation. *Gastroenterology.* Apr 2003; 124(4): 1105-10. PMID 12671903
32. Iyer K, DiBaise JK, Rubio-Tapia A. AGA Clinical Practice Update on Management of Short Bowel Syndrome: Expert Review. *Clin Gastroenterol Hepatol.* Oct 2022; 20(10): 2185-2194.e2. PMID 35700884
33. Kaufman SS, Atkinson JB, Bianchi A, et al. Indications for pediatric intestinal transplantation: a position paper of the American Society of Transplantation. *Pediatr Transplant.* Apr 2001; 5(2): 80-7. PMID 11328544
34. Centers for Medicare and Medicaid Services. National Coverage Determination for Intestinal and Multi-visceral Transplantation (260.5). 2006; <https://www.cms.gov/medicare-coverage-database/details/ncd-details.aspx?NCDId=280>. Accessed June 14, 2023.

POLICY HISTORY - THIS POLICY WAS APPROVED BY THE FEP® PHARMACY AND MEDICAL POLICY COMMITTEE ACCORDING TO THE HISTORY BELOW:

Date	Action	Description
March 2012	New policy	
March 2013	Replace policy	Policy updated with literature review. Added references 7 and 8; other references renumbered. No change in policy statements.
March 2014	Replace policy	Policy updated with literature review. Added reference number 10; other references renumbered. Medically necessary policy statement added following a failed primary transplants.
September 2015	Replace policy	Policy updated with literature review; references 5 and 12 added. Policy statements unchanged.
December 2017	Replace policy	Policy updated with literature review through June 22, 2017; references 7-11, 14, and 28 added. Policy statements unchanged.
December 2018	Replace policy	Policy updated with literature review through June 7, 2018; reference 26-27 added. Policy statements unchanged.
December 2019	Replace policy	Policy updated with literature review through June 10, 2019; no references added. Policy statements unchanged.
December 2020	Replace policy	Policy updated with literature review through June 24, 2020; references added. Policy statements unchanged.
December 2021	Replace policy	Policy updated with literature review through June 14, 2021; no references added. Policy statements unchanged.
December 2022	Replace policy	Policy updated with literature review through June 9, 2022; no references added. Minor editorial refinements to policy statements; intent unchanged.
December 2023	Replace policy	Policy updated with literature review through June 14, 2023; references added. Minor editorial refinements to policy statements; intent unchanged.

The policies contained in the FEP Medical Policy Manual are developed to assist in administering contractual benefits and do not constitute medical advice. They are not intended to replace or substitute for the independent medical judgment of a practitioner or other health care professional in the treatment of an individual member. The Blue Cross and Blue Shield Association does not intend by the FEP Medical Policy Manual, or by any particular medical policy, to recommend, advocate, encourage or discourage any particular medical technologies. Medical decisions relative to medical technologies are to be made strictly by members/patients in consultation with their health care providers. The conclusion that a particular service or supply is medically necessary does not constitute a representation or warranty that the Blue Cross and Blue Shield Service Benefit Plan covers (or pays for) this service or supply for a particular member.