

## MEDICAL POLICY

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|----------------------|---|
| <b>POLICY TITLE</b>  | <b>ISOLATED SMALL BOWEL TRANSPLANT AND SMALL BOWEL/LIVER AND MULTIVISCERAL TRANSPLANT</b> |
| <b>POLICY NUMBER</b> | <b>MP 9.013</b>   |

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| <b>CLINICAL BENEFIT</b> | <input type="checkbox"/> MINIMIZE SAFETY RISK OR CONCERN.<br><input type="checkbox"/> MINIMIZE HARMFUL OR INEFFECTIVE INTERVENTIONS.<br><input type="checkbox"/> ASSURE APPROPRIATE LEVEL OF CARE.<br><input type="checkbox"/> ASSURE APPROPRIATE DURATION OF SERVICE FOR INTERVENTIONS.<br><input checked="" type="checkbox"/> ASSURE THAT RECOMMENDED MEDICAL PREREQUISITES HAVE BEEN MET.<br><input type="checkbox"/> ASSURE APPROPRIATE SITE OF TREATMENT OR SERVICE. |
| <b>Effective Date:</b>  | <b>2/1/2026</b>   |

### POLICY

#### ISOLATED SMALL BOWEL TRANSPLANT

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 dependency 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 **investigational** in all other situations. There is insufficient evidence to support a conclusion concerning the health outcomes or benefits associated with this procedure

A small bowel transplant is considered **investigational** for adults and pediatric individuals with intestinal failure who can tolerate TPN. There is insufficient evidence to support a conclusion concerning the health outcomes or benefits associated with this procedure.

#### SMALL BOWEL/LIVER AND MULTIVISCERAL TRANSPLANT

Transplants, such as a multivisceral transplant and a small bowel and liver transplant may be considered **medically necessary** for pediatric and adult individuals with intestinal failure (characterized by loss of absorption and the inability to maintain protein-energy, fluid, electrolyte, or micronutrient balance) who have been managed with long-term TPN and who have developed evidence of impending end-stage liver failure.

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Retransplants, such as a multivisceral retransplant and a small bowel and liver retransplant, may be considered **medically necessary** after a failed primary small bowel/liver transplant or multivisceral transplant.

A small bowel and liver transplant or multivisceral transplant is considered **investigational** in all other situations. There is insufficient evidence to support a conclusion concerning the health outcomes or benefits associated with this procedure.

### POLICY GUIDELINES

#### General Criteria

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

- Known current malignancy, including metastatic cancer
- Recent malignancy with high risk of recurrence
- Untreated systemic infection making immunosuppression unsafe, including chronic infection
- Other irreversible end-stage disease 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

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 one cause of intestinal failure.

#### SMALL BOWEL SPECIFIC CRITERIA

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.

#### SMALL BOWEL/LIVER AND MULTIVISCERAL TRANSPLANT

Candidates should meet the following criteria:

- Adequate cardiopulmonary status
- Documentation of patient compliance with medical management.

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### SMALL BOWEL/LIVER SPECIFIC CRITERIA

Evidence of intolerance of TPN includes, but is not limited to, multiple and prolonged hospitalizations to treat TPN-related complications, or the development of progressive but reversible 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.

### PRODUCT VARIATIONS

This policy is only applicable to certain programs and products administered by Capital Blue Cross and subject to benefit variations. Please see additional information below.

**FEP PPO** - Refer to FEP Medical Policy Manual. The FEP Medical Policy manual can be found at:

<https://www.fepblue.org/benefit-plans/medical-policies-and-utilization-management-guidelines/medical-policies> .

### DESCRIPTION/BACKGROUND

#### Solid Organ Transplantation

Solid organ transplantation offers a treatment option for patients with different types of end-stage organ failure that can be lifesaving or provide significant improvements to a patient's quality of life. Many advances have been made in the last several decades to reduce perioperative complications. Available data support improvement in long-term survival as well as improved quality of life, particularly for liver, kidney, pancreas, heart, and lung transplants.

Allograft rejection remains a key early and late complication risk for any organ transplantation. Transplant recipients require life-long immunosuppression to prevent rejection. Patients are prioritized for transplant by mortality risk and severity of illness criteria developed by the Organ Procurement and Transplantation Network (OPTN) and United Network of Organ Sharing (UNOS).

#### ISOLATED SMALL BOWEL TRANSPLANT

##### Short Bowel Syndrome

Short bowel syndrome is a condition in which the absorbing surface of the small intestine is inadequate due to extensive disease or surgical removal of a large portion of the small intestine. The spectrum of clinical disease is widely variable from only single micronutrient malabsorption to complete intestinal failure, defined as the reduction of gut function below the minimum necessary for the absorption of macronutrients and/or water and electrolytes. In adults, etiologies of short bowel syndrome include ischemia, trauma, volvulus, and tumors. In children, gastroschisis, volvulus, necrotizing enterocolitis, and congenital atresia are predominant causes. Although the actual prevalence of short bowel syndrome is not clear primarily due to under-reporting and a lack of reliable patient databases, its prevalence is estimated to be 30 cases per million in the U.S.

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### Treatment

The small intestine, particularly the ileum, can adapt to some functions of the diseased or removed portion over a period of 1 to 2 years. Prognosis for recovery depends on the degree and location of small intestine damage. Therapy focuses on achieving adequate macro- and micronutrient uptake in the remaining small bowel. Pharmacologic agents have been studied to increase villous proliferation and slow transit times, and surgical techniques have been advocated to optimize remaining small bowel.

However, some patients with short bowel syndrome are unable to obtain adequate nutrition from enteral feeding and become chronically dependent on total parenteral nutrition (TPN). For patients with short bowel syndrome, the rate of parenteral nutrition dependency at 1, 2, and 5 years has been reported to be 74%, 64%, and 48%, respectively. Patients with complications from TPN may be considered candidates for a small bowel transplant. Complications include catheter-related mechanical problems, infections, hepatobiliary disease, and metabolic bone disease. While cadaveric intestinal transplant is the most commonly performed transplant, there has been a recent interest in using living donors.

Intestinal transplants (including multivisceral and bowel/liver) represent a small minority of all solid organ transplants. In 2023, 95 intestinal transplants were performed in the U.S. The number of new patients added to the intestinal transplant waiting list as of 6/27/2024 was 192..

### SMALL BOWEL/LIVER AND MULTIVISCERAL TRANSPLANT

In 2023, 46,629 transplants were performed in the United States procured from 39,679 deceased donors and 6950 living donors.<sup>2</sup> Intestinal transplants occur less frequently than other organ transplants, with 10 or fewer patients receiving liver-intestine transplant each year from 2008 to 2019. Small bowel and liver or multivisceral transplant is usually considered in adults and children who develop serious complications related to parenteral nutrition, including inaccessibility (e.g., due to thrombosis) of access sites, catheter-related sepsis, and cholestatic liver disease.

### Short Bowel Syndrome

Short bowel syndrome is defined as an inadequate absorbing surface of the small intestine due to extensive disease or surgical removal of a large portion of small intestine. In some instances, short bowel syndrome is associated with liver failure, often due to the long-term complications of TPN.

### Treatment

A small bowel/liver transplant or a multivisceral transplant includes the small bowel and liver with 1 or more of the following organs: stomach, duodenum, jejunum, ileum, pancreas, and/or colon. The type of transplantation depends on the underlying etiology of intestinal failure, quality of native organs, presence or severity of liver disease, and history of prior abdominal surgeries. A multivisceral transplant is indicated when anatomic or other medical problems preclude a small bowel/liver transplant. Complications following small bowel/liver and multivisceral

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transplants include acute or chronic rejection, donor-specific antibodies, infection, lymphoproliferative disorder, graft-versus-host disease, and renal dysfunction.

### REGULATORY STATUS

Small bowel transplantation and small bowel/liver and multivisceral transplantation are surgical procedures and, as such, are not subject to regulation by the U.S. Food and Drug Administration.

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

##### **Small Bowel Transplant**

For individuals who have intestinal failure who receive a small bowel transplant, the evidence includes case series. Relevant outcomes are overall survival, 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 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 post transplantation care is expected to worsen comorbid conditions significantly. Guidelines and U.S. federal policy no longer view HIV infection as an absolute contraindication for solid organ transplantation. The evidence is sufficient to determine that the technology results in a meaningful 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 overall survival, 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 criteria for transplantation. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

##### **Small Bowel/Liver and Multivisceral Transplant**

For individuals who have intestinal failure and evidence of impending end-stage liver failure who receive a small bowel and liver transplant alone or multivisceral transplant, the evidence includes a registry study and a limited number of case series. Relevant outcomes are overall survival, morbid events, and treatment-related mortality and morbidity. These transplant

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procedures are infrequently performed and few reported case series exist. However, results from the available case series have revealed fairly high postprocedural survival rates. Given these results and the exceedingly poor survival rates of patients who exhaust all other treatments, transplantation may prove not only to be the last option, but also a beneficial one. Transplantation is contraindicated for patients in whom the procedure is expected to be futile due to comorbid disease, or in whom post transplantation care is expected to significantly worsen comorbid conditions. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have a failed small bowel and liver or multivisceral transplant without contraindications for retransplant who receive a small bowel and liver retransplant alone or multivisceral retransplant, the evidence includes case series. Relevant outcomes are overall survival, morbid events, and treatment-related mortality and morbidity. Although limited in quantity, the available post retransplantation data have suggested reasonably high survival rates. Given exceedingly poor survival rates without retransplantation of patients who have exhausted other treatments, evidence of postoperative survival from uncontrolled studies is sufficient to demonstrate that retransplantation provides a survival benefit in appropriately selected patients. Retransplantation is contraindicated for patients in whom the procedure is expected to be futile due to comorbid disease or in whom post transplantation care is expected to significantly worsen comorbid conditions. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcomes.

### DEFINITIONS

**BLUE DISTINCTION CENTERS FOR TRANSPLANT (BDCT)** is a cooperative effort of the Blue Cross and Blue Shield Plans, the Blue Cross and Blue Shield Association and participating medical institutions to provide patients who need transplants with access to leading centers through a coordinated, streamlined program of transplant management.

**CADAVER** refers to a dead body or corpse.

**INTESTINAL FAILURE** is a loss of absorptive capacity of the small bowel secondary to severe primary gastrointestinal disease or surgically induced short bowel syndrome.

**MALABSORPTION** is disordered or inadequate absorption of nutrients from the intestinal tract, especially the small intestine. The syndrome may be associated with, or due to, a number of diseases including those affecting the intestinal mucosa, such as infections, tropical sprue, celiac disease, pancreatic insufficiency, or lactase deficiency. It may also be due to surgery such as gastric resection and ileal bypass or to antibiotic therapy such as neomycin.

**MULTIVISCERAL TRANSPLANT** refers to the transplantation of small bowel and liver in conjunction with other gastrointestinal organs.

**TPN** is the intravenous provision of dextrose, amino acids, emulsified fats, trace elements, vitamins, and minerals to patients who are unable to assimilate adequate nutrition by mouth.

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### DISCLAIMER

*Capital Blue Cross' medical policies are used to determine coverage for specific medical technologies, procedures, equipment, and services. These medical policies do not constitute medical advice and are subject to change as required by law or applicable clinical evidence from independent treatment guidelines. Treating providers are solely responsible for medical advice and treatment of members. These policies are not a guarantee of coverage or payment. Payment of claims is subject to a determination regarding the member's benefit program and eligibility on the date of service, and a determination that the services are medically necessary and appropriate. Final processing of a claim is based upon the terms of contract that applies to the members' benefit program, including benefit limitations and exclusions. If a provider or a member has a question concerning this medical policy, please contact Capital Blue Cross' Provider Services or Member Services.*

### CODING INFORMATION

**\*Note:** This list of codes may not be all-inclusive, and codes are subject to change at any time. The identification of a code in this section does not denote coverage as coverage is determined by the terms of member benefit information. In addition, not all covered services are eligible for separate reimbursement.

#### Covered when medically necessary:

| Procedure codes |       |       |       |       |       |       |       |       |  |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| 44132           | 44133 | 44135 | 44136 | 44137 | 44715 | 44720 | 44721 | 44799 |  |
| 47133           | 47135 | 47140 | 47141 | 47142 | 47143 | 47144 | 47145 | 47146 |  |
| 47147           | 47399 | S2053 | S2054 | S2055 | S2152 |       |       |       |  |

| ICD-10-CM Diagnosis Codes | Description                                     |
|---------------------------|---|
| K72.00                    | Acute and subacute hepatic failure without coma |
| K72.01                    | Acute and subacute hepatic failure with coma    |
| K72.10                    | Chronic hepatic failure without coma            |
| K72.11                    | Chronic hepatic failure with coma               |
| K90.83                    | Intestinal Failure                              |
| T86.851                   | Intestine transplant failure                    |

### REFERENCES

#### Isolated Small Bowel Transplant

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1. Black CK, Termanini KM, Aguirre O, et al. Solid organ transplantation in the 21st 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.* 2024
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.* Jul-Aug 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, Hettermann 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.* Jan-Feb 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

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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, Jimenez Romero C, Morales Ruiz E, et al. Renal failure associated with intestinal transplantation: our experience in Spain. *Transplant Proc.* Jul-Aug 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.* Feb-Mar 1997; 29(1-2): 686-7. PMID 9123480
25. Colfax G. HIV Organ Policy Equity (HOPE) Act Is Now Law. 2013
26. United Network for Organ Sharing (UNOS). OPTN policies, procedures implemented to support HOPE Act. 2015
27. Organ Procurement and Transplantation Network (OPTN). Organ Procurement and Transplantation Network Policies. 2024
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 transplants 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

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1. Black CK, Termanini KM, Aguirre O, et al. Solid organ transplantation in the 21st century. *Ann Transl Med.* Oct 2018; 6(20): 409. PMID 30498736
2. Organ Procurement and Transplantation Network (OPTN). *National Data.*
3. Sulkowski JP, Minneci PC. Management of short bowel syndrome. *Pathophysiology.* Feb 2014; 21(1): 111-8. PMID 24341969
4. Bharadwaj S, Tandon P, Gohel TD, et al. Current status of intestinal and multivisceral transplantation. *Gastroenterol Rep (Oxf).* Feb 2017; 5(1): 20-28. PMID 28130374
5. Loo L, Vrakas G, Reddy S, et al. Intestinal transplantation: a review. *Curr Opin Gastroenterol.* May 2017; 33(3): 203-211. PMID 28282321
6. Mangus RS, Tector AJ, Kubal CA, et al. Multivisceral transplantation: expanding indications and improving outcomes. *J Gastrointest Surg.* Jan 2013; 17(1): 179-86; discussion p. 186-7. PMID 23070622
7. Abu-Elmagd KM, Costa G, Bond GJ, et al. Five hundred intestinal and multivisceral transplants at a single center: major advances with new challenges. *Ann Surg.* Oct 2009; 250(4): 567-81. PMID 19730240
8. 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
9. Raghu VK, Beaumont JL, Everly MJ, et al. Pediatric intestinal transplantation: Analysis of the intestinal transplant registry. *Pediatr Transplant.* Dec 2019; 23(8): e13580. PMID 31531934
10. 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
11. Garcia Aroz S, Tzvetanov I, Hettermann 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
12. 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
13. 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
14. Lauro A, Zanfi C, Dazzi A, et al. Disease-related intestinal transplant in adults: results from a single center. *Transplant Proc.* Jan-Feb 2014; 46(1): 245-8. PMID 24507060
15. Varkey J, Simren M, Bosaeus I, et al. Survival of patients evaluated for intestinal and multivisceral transplantation - the Scandinavian experience. *Scand J Gastroenterol.* Jun 2013; 48(6): 702-11. PMID 23544434
16. Spence AB, Natarajan M, Fogleman S, et al. Intra-abdominal infections among adult intestinal and multivisceral transplant recipients in the 2-year post-operative period. *Transpl Infect Dis.* Feb 2020; 22(1): e13219. PMID 31778012

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17. Nagai S, Mangus RS, Anderson E, et al. *Cytomegalovirus Infection After Intestinal/Multivisceral Transplantation: A Single-Center Experience With 210 Cases.* *Transplantation.* Feb 2016; 100(2): 451-60. PMID 26247555
18. Timpone JG, Yimen M, Cox S, et al. *Resistant cytomegalovirus in intestinal and multivisceral transplant recipients.* *Transpl Infect Dis.* Apr 2016; 18(2): 202-9. PMID 26853894
19. 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
20. Cromvik J, Varkey J, Herlenius G, et al. *Graft-versus-host Disease After Intestinal or Multivisceral Transplantation: A Scandinavian Single-center Experience.* *Transplant Proc.* Jan-Feb 2016; 48(1): 185-90. PMID 26915866
21. 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
22. Wu G, Selvaggi G, Nishida S, et al. *Graft-versus-host disease after intestinal and multivisceral transplantation.* *Transplantation.* Jan 27, 2011; 91(2): 219-24. PMID 21076376
23. Organ Procurement and Transplantation Network (OPTN). *Organ Procurement and Transplantation Network Policies.* 2023
24. 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
25. Ekser B, Kubal CA, Fridell JA, et al. *Comparable outcomes in intestinal retransplantation: Single-center cohort study.* *Clin Transplant.* Jul 2018; 32(7): e13290. PMID 29782661
26. Mazariegos GV, Soltys K, Bond G, et al. *Pediatric intestinal retransplantation: techniques, management, and outcomes.* *Transplantation.* Dec 27, 2008; 86(12): 1777-82. PMID 19104421
27. American Gastroenterological Association. *American Gastroenterological Association medical position statement: short bowel syndrome and intestinal transplantation.* *Gastroenterology.* Apr 2003; 124(4): 1105-10. PMID 12671903
28. 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
29. 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
30. Center for Medicare & Medicaid Services. *National Coverage Determination (NCD) for Intestinal and Multi-Visceral Transplantation (260.5).* 2006

## POLICY HISTORY

|                 |   |
|-----------------|---|
| <b>MP 9.013</b> | <b>05/21/2020 Consensus Review.</b> No change to policy statements. Reformatted policy. Language revised under Product Variations, Benefit Variations and Disclaimer section. HIV guidelines and references updated. Coding reviewed. |
|-----------------|---|

## MEDICAL POLICY

|               |  |
|---------------|--|
| POLICY TITLE  | ISOLATED SMALL BOWEL TRANSPLANT AND SMALL BOWEL/LIVER AND MULTIVISCERAL TRANSPLANT |
| POLICY NUMBER | MP 9.013   |

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|--|--|
|  | <b>05/18/2021 Consensus Review.</b> Policy statement unchanged. Background and References updated.   |
|  | <b>10/20/2022 Consensus Review.</b> Policy statement unchanged. References and background updated.   |
|  | <b>09/15/2023 Consensus Review.</b> Policy statement unchanged. References reviewed and updated. Coding reviewed.  |
|  | <b>09/10/2024 Consensus Review.</b> Policy statements unchanged. References reviewed and updated. Coding reviewed with no coding changes.  |
|  | <b>09/19/2025 Consensus Review.</b> Editorial refinements to policy statements; no change to intent. Updated policy guidelines, background, rationale, ICD-10 table and references. Added 44799 to coding table. |

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