Small Bowel Transplant*

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DESCRIPTION

For an intestinal allograft in combination with liver allograft, and multivisceral transplant which typically includes the small bowel/liver in combination with one or more other abdominal visceral organs such as the stomach and pancreas see medical policy 07.03.05 Small Bowel/Liver and Multivisceral Transplant*.

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 supports 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).

A small bowel (intestinal) transplant may be performed as an isolated procedure. An isolated small bowel (intestinal) transplant has evolved into an established therapeutic modality in the management of the individual with irreversible intestinal failure. It is performed mainly in individuals with short bowel syndrome (SBS) and those who develop severe complications due to total parenteral nutrition (TPN). It may also be considered a technique to avoid end-stage liver failure related to chronic TPN, thus avoiding the necessity of a small bowel/liver or multivisceral transplant. The goal of transplantation is to eliminate the need for TPN and to reverse or prevent TPN associated liver disease.

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. Some conditions are more closely associated with pediatric intestinal failure while others are more common with intestinal failure in adults.

The following are pediatric conditions which may cause intestinal failure:

- Short bowel syndrome following extensive bowel surgeries (midgut volvulus)
- Congenital malformations (e.g., intestinal atresia, gastroschisis, aganglionosis)
- Absorptive impairment (e.g., microvillus involution disease, chronic intestinal pseudo-obstruction)
- Infections of gastrointestinal tract (e.g., necrotizing enterocolitis)

The following are adult conditions which may cause intestinal failure:

- Crohn's disease
- Tumors of the mesenteric root and retroperitoneum (e.g., desmoid tumor)
- Short bowel syndrome following extensive surgeries secondary to mesenteric ischemia (following thrombosis, embolism, volvulus, or trauma)
- Chronic intestinal pseudo-obstruction
- Small bowel tumors such as Gardner's Syndrome (familial colorectal polyposis)

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 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.

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 2021, 96 intestinal transplants were performed in the U.S. 3, Overall, both the number of new patients added to the intestinal transplant waiting list (n=142) and the number of intestinal transplants performed increased slightly from their lowest levels in 2019.

Small Bowel Transplantation
Intestinal transplants represent a small minority of all solid organ transplants.

Clinical Context and Purpose
The purpose of a small bowel transplant in patients who have intestinal failure is to provide a treatment option that is an alternative to or an improvement on existing therapies. Parenteral nutrition has been a mainstay of therapy for patients with intestinal failure for decades. Medical advances have resulted in improved survival in parenteral nutrition-dependent patients, primarily through an increased likelihood of weaning (i.e., achieving enteral autonomy) and reduced rates and progression of intestinal failure-associated liver disease and other life-threatening complications of prolonged parenteral nutrition administration.

The question addressed in this evidence review is: Does a small bowel transplant improve the net health outcome in individuals with intestinal failure?

The following PICO was used to select literature to inform this review.

Populations
The relevant population of interest are individuals with intestinal failure.

Interventions
The therapy being considered is a small bowel transplant. Small bowel transplantation is provided in a hospital setting by specialized staff who are equipped to perform the surgical procedure and manage postsurgical intensive care.

Comparators
The following practices are currently being used to make decisions about intestinal failure: medical management and parenteral nutrition.

Outcomes
The general outcomes of interest are overall survival (OS) and treatment related adverse events (e.g., immunosuppression, graft failure, surgical complications, infections). Short-term follow-up ranges from immediately post-surgery to 30 days post transplantation; lifelong follow-up (out to 10 years or more given current survival data) is necessary due to ongoing immunosuppression drugs and risk of graft failure.

Study Selection Criteria
Methodologically credible studies were selected using the following principles:

- To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs.
- In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies.
- To assess long-term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought.

Review of Evidence

Case Series
The majority of the published literature consists of case series, mainly reported by single centers in the United States, Japan and Europe. The tables below summarize the characteristics and results of these case series, respectively. Many case series have included small bowel/liver transplantation and multivisceral transplantation which are the focus of the evidence review in medical policy 07.03.05.

The main reasons for transplantation was short bowel syndrome. Other reasons include congenital enteropathies and motility disorders. The most common outcomes reported were survival rates and weaning off TPN. Several studies have presented survival rates by type of transplantation, while others have combined all types of transplants when reporting survival rates. When survival rates were reported by type of transplant, isolated small bowel transplantation had higher survival rates than multivisceral transplants.

Several investigators have reported higher survival rates in transplantations conducted more recently than those conducted earlier. Reasons for improved survival rates in more recent years have been attributed to the development of more effective immunosuppressive drugs and the learning curve for the complex procedure.

udan (2010) published a review of the literature on long-term outcomes after intestinal transplantation.[7,] Sudan noted that intestinal transplantation had become standard therapy for patients with life-threatening complications from parenteral nutrition therapy. Data from current single center series have indicated 1-year patient survival rates between 78% and 85% and 5-year or more survival rates between 56% and 61%. Concerning pediatric intestinal transplant patients, most achieve normal growth velocity at 2 years posttransplant. However, oral aversion is common; tube feedings are necessary for 45% of children. Sudan also reported on parental surveys of quality of life for pediatric transplant patients in which intestinal transplant patients appear to have modestly improved quality of life compared with those remaining on TPN and slightly worse than matched school-age controls without intestinal disease.

Authors of these series, as well as related reviews, have observed that while outcomes have improved over time, recurrent and chronic rejection and complications of immunosuppression continue to be obstacles to long-term survival. A separate discussion of adverse events follows the evidence tables.

Summary of Key Case Series Characteristics for Transplantations

Study	Location	N	Median Age (Range), y	Interventions		Follow-Up (Range), mo
				Treatment	n	
Lacaille et al (2017)	France	110	5.3 (0.4 to 19)	• Isolated IT Combined liver IT Multivisceral graft	60 45 5	Of 55 alive: • 17 at <5 y • 17 at 5 to 10 y • 21 at ≥10 y
Garcia Aroz et al (2017)	U.S.	10	1.5 (0.7 to 13)	• Isolated IT Combined liver IT	7 3	6/7 alive at follow-up ≥10 y
Dore et al (2016	U.S.	30	0.2 (0.1 to 18)	• Isolated IT Combined liver IT Multivisceral graft	6 6 18	28 (4 to 175)
Rutter et al (2016)	U.K.	60	1.8 (0 to 8)	• Isolated IT Multivisceral graft Modified multivisceral	16 35 9	21.3 (0 to 95)
Lauro et al (2014)	Italy	46	34 (NR)	• Isolated IT Combined liver IT Multivisceral graft	34 6 6	51.3
Ueno et al (2014)	Japan	24	0 to 2 y: 6[c] • 3 to 6 y: 6 • 7 to 18 y: 8 • ≥19 y: 4	• Isolated IT Combined liver IT	23 1	NR
Benedetti et al (2006)	U.S.	11	27 (1.5 to 50)	• Isolated IT	11	NR

IT: intestinal transplantation; NR: not reported.
[a] All living donors.
[b] Twelve living donors and 12 cadaveric donors.
[c] Reported as age range and n.

Summary of Key Case Series Results for Transplantations

Study	Interventions		Survival		Off TPN	
	Treatment	n	Years	%	Measure	%
Lacaille et al (2017)	• Isolated IT Combined liver Multivisceral graft	60 45 5	OS at 10 Patient survival for liver-containing grafts at 10 and 18 Patient survival for isolated IT at 10 and 18	52; 48; 45 59; 56	All combined at last FU	73
Garcia Aroz et al (2017)[a]	• Isolated IT • Combined liver IT	7 3	All combined:	70	All combined at last FU	100
Dore et al (2016)	• Isolated IT Combined liver IT Multivisceral graft	6 6 18	9 10 2.5	83 33 67	All combined: □□in 31 days □□at last FU	 71 62
Rutter et al (2016)	• Isolated IT Multivisceral graft Modified multivisceral	16 35 9	1 5	92; 71; 85 83; 33; 65		NR
Lauro et al (2014)	• Isolated IT Combined liver IT Multivisceral graft	34 6 6	All combined: 1 3 5 10	 77 58 53 37		NR
Ueno et al (2014)	• Isolated IT • Combined liver IT	23 1	All combined: 1 5	 86 68		80
Benedetti et al (2006)[a]	• Isolated IT	11	1 3	82 82		100

FU: follow-up; IT: intestinal transplantation; NR: not reported; OS: overall survival; TPN: total parenteral nutrition.
[a] All living donors.
[b] Twelve living donors and 12 cadaveric donors.

Adverse Events

Systematic Reviews

One issue discussed in intestinal transplantation literature is an earlier referral to avoid combined liver and intestine transplantation. It has been suggested that removing the restriction on intestinal transplantation to patients who have severe complications from TPN and recommending earlier transplantation may improve survival. However, in a review of the status of intestinal transplantation, Vianna et al (2008) identified no randomized trials that compared intestinal transplantation with long-term TPN; therefore, optimal timing for earlier transplantation has not been established.

Case Series
Wu et al. (2016) investigated the incidence and risk factors of acute antibody-mediated rejection (ABMR) among patients undergoing intestinal transplantation (N=175).15, The mean age of enrolled patients was 25 years. Acute ABMR was diagnosed by clinical evidence; histologic evidence of tissue damage; focal or diffuse linear C4d deposition; and circulating anti-human leukocyte antigen antibodies. Of the 175 intestinal transplants, 58% were liver-free small intestine grafts, 36% included a liver graft, and 6.3% were retransplantations. Eighteen cases of acute ABMR were identified, 14 (14%) among the patients undergoing first liver-free transplantation, 2 (3%) among patients undergoing liver/small bowel transplantation, and 2 (18%) among the patients undergoing retransplantation. Graft failure occurred in 67% of patients with acute ABMR. The presence of a donor-specific antibody and a liver-free graft were associated with the development of acute ABMR.

Florescu et al. (2012) have published several retrospective reviews of complications in a cohort of 98 pediatric patients. Twenty-one (21.4%) of these children had an isolated small bowel transplant; the remainder had combined transplants. Their 2012 study reported that 68 (69%) of the 98 patients developed at least 1 episode of bloodstream infection. Among patients with an isolated small bowel transplant, the median time to infection for those who developed one was 4.5 months (95% confidence interval [CI], 2.4 to 6.7 months). Also in 2012, these researchers reported that 7 (7%) of 98 patients developed cytomegalovirus disease; only 1 had an isolated small bowel transplant. Florescu et al. (2010) previously reported that, in 25 (25.5%) of 98 cases reviewed who developed at least 1 episode of fungal infection, Candida infection was most common. Mortality rates did not differ significantly between patients who did (32.3%) and did not develop a fungal infection (29.8%; p=.46).

Other series have reported on renal failure after intestinal transplantation. For example, Calvo Pulido et al. (2014) reported on 21 adults who underwent intestinal transplantation; 17 were isolated small bowel transplants. Thirteen (62%) patients experienced renal failure; the etiology included high ileostomy output, immunosuppression, and medical treatment. Boyer et al (2013) reported that 7 of 12 children who had an isolated small bowel transplant developed renal function complications at some point after surgery. Before treatment, all patients had normal renal functioning.

Living Donor Transplants
Cadaveric intestines are most commonly used but recently there has been interest in using a portion of intestine harvested from a living related donor. Potential advantages of living donor include the ability to plan transplantation electively and better antigen matching, leading to improved management of rejection. Case reports from the 1990s have reported on 1 or 2 patients with different lengths of the ileum or jejunum. While there appear to be few complications to the donors, of the 6 cases reported, 5 recipients remain on TPN for at least part of their caloric intake. One patient was weaned off TPN.

The tables above provide details on case series that used living donors (Garcia Aroz et al. [2017], Ueno et al. [2014], and Benedetti et al. [2006]). In general, survival rates of recipients with living donors are comparable to rates for recipients of cadaveric donations. Living related donors were reported to have an uneventful recovery. Weight loss and diarrhea were reported among donors, but recovery was without complications. Most of the published literature consists of case series. In general survival rates of recipients with living donors are comparable to rates for recipients of cadaveric donations. Living related donors were reported to have an uneventful recovery. Weight loss and diarrhea were reported among donors, but recovery was without complications.

Section Summary: Small Bowel Transplantation
Small bowel transplant is infrequently performed compared to other forms of organ transplantation. Most of the published literature is case series mainly reported by single centers. 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 bowl transplant may prevent the need for a later combined liver/small bowel transplant.

Small Bowel Retransplantation

Clinical Context and Purpose
The purpose of small bowel retransplants in patients who have failed small bowel transplant and do not have contraindication(s) for retransplant is to provide a treatment option that is an alternative to or an improvement on existing therapies.

The question addressed in this evidence review is: Does small bowel retransplant improve the net health outcome in individuals whose small bowel transplant has failed?

The following PICO was used to select literature to inform this review.

Populations
The relevant population of interest are individuals who have failed small bowel transplant and do not have contraindication(s) for retransplant.

Interventions
The therapy being considered is a small bowel retransplant.

Comparators
The following practices are currently being used to make decisions about the intestinal failure of an initial small bowel transplant: medical management and parenteral nutrition.

Outcomes
The general outcomes of interest are overall survival (OS) and treatment related adverse events (e.g., immunosuppression, graft failure, surgical complications, infections). Short-term follow-up ranges from immediately post-surgery to 30 days post-transplantation;

lifelong follow-up (out to 10 years or more given current survival data) is necessary due to ongoing immunosuppression drugs and risk of graft failure.

Study Selection Criteria
Methodologically credible studies were selected using the following principles:

- To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs.
- In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies.
- To assess long-term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought**.**

Case Series
A few case series from single institutions and a single analysis of data from the United Network for Organ Sharing database have provided evidence on the use of retransplantation in patients who have failed primary small bowel transplant. The most common causes of graft loss in small bowel transplant are infection, rejection (acute and chronic) and technical or clinical complications. Careful patient selection, post-transplant immunosuppression and patient management are essential for successful long-term outcomes.

Desai et al. (2012) have published the most comprehensive reporting of outcomes after repeat small bowel transplant in the U.S. The authors evaluated data for patients in the UNOS database who underwent small bowel transplants in the U.S. between 1987 and 2009.

Summary of Key Case Series Characteristics for Retransplantations

Study	Location	N	Median Age (Range), y	Interventions		Follow-Up (Range), mo
				Treatment	n	
Lacaille et al (2017)	France	10	13 (5 to 16)	• Isolated IT • Combined liver IT	3 7	4
Desai et al (2012)	U.S.	72 adults; 77 children	NR	Adults: • Isolated IT • Combined liver IT Children: • Isolated IT • Combined liver IT	 4 1 3 1 2 8	NR

Study	Location	N	Median Age (Range), y	Interventions		Follow-Up (Range), mo
					49	
Abu-Elmagd et al (2009)	U.S.	47	NR	• Isolated IT • Combined liver IT • Multivisceral graft	31 179	NR

IT: intestinal transplantation; NR: not reported.

Summary of Key Case Series Results for Retransplantations

Study	Interventions		Survival		Off TPN
	Treatment	n	Years	%	
Lacaille et al. (2017)	• Isolated IT • Combined liver IT	37	All combined at last follow-up:	30	NR
Desai et al. (2012)	Adults: • Isolated IT • Combined liver IT Children: • Isolated IT • Combined liver IT	 41 31 28 49	Adults: 1/3/5 (isolated IT); 1/3/5 (Combined liver IT) Children: 1/3/5 (isolated IT); 1/3/5 (Combined liver IT)	 80/47/29; 63/56/47 81/74/57; 42/42/42	NR
Abu-Elmagd et al (2009)	• Isolated IT • Combined liver IT • Multivisceral graft	317 9	All combined: 1 5	 69 47	NR

IT: intestinal transplantation; NR: not reported; TPN: total parenteral nutrition.

Section Summary: Small Bowel Retransplantation

Although the literature is limited in quantity, the available data have suggested reasonably high survival rates after small bowel retransplantation in patients who continue to meet all eligibility criteria for transplantation.

Summary of Evidence
For individuals who have intestinal failure who receive a small bowel transplant, the evidence includes case series. 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 unsuccessful due to comorbid disease or in whom post-transplantation care is expected to worsen comorbid conditions significantly. 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. 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.

Practice Guidelines and Position Statements

American Gastroenterological Association (AGA)
(2003) The AGA produced a medical position statement on short bowel syndrome and intestinal transplantation. It recommends dietary, medical, and surgical solutions. Indications for intestinal transplant mirror those of Medicare in patients who fail TPN therapy for one of the following reasons:

- Impending or overt liver failure (increased serum bilirubin and/or liver enzyme levels, splenomegaly, thrombocytopenia, gastroesophageal varices, coagulopathy, stomal bleeding, hepatic fibrosis or cirrhosis)
- Thrombosis of central venous channels (2 thromboses in subclavian, jugular, or femoral veins)
- Frequent central line related sepsis (2 episodes of systemic sepsis secondary to line infection per year, 1 episode of line related fungemia, septic shock, or acute respiratory distress syndrome).
- Frequent severe dehydration.

Until better data become available, these parameters are likely to be widely recognized as the indications for intestinal transplantation.

American Society of Transplantation (AST)
(2001) The AST issued a position paper on indications for pediatric intestinal transplantation. The position paper included the following:

"Parenteral nutrition represents standard therapy for children with short bowel syndrome and other causes of intestinal failure. Most infants with short bowel syndrome eventually wean from parenteral nutrition, and most of those who do not wean tolerate parenteral nutrition for protracted periods. However, a subset of children with intestinal failure remaining dependent on parenteral nutrition will develop life-threatening complications arising from therapy. Intestinal transplantation can now be recommended for this select group. Life-threatening complications warranting consideration of intestinal transplantation include parenteral nutrition-associated liver disease, recurrent sepsis, and threatened loss of central venous access. Children with liver dysfunction should be considered for isolated intestinal transplantation before irreversible, advanced bridging fibrosis or cirrhosis supervenes, for which a combined liver and intestinal transplant is necessary. Irreversible liver disease is suggested by hyperbilirubinemia persisting beyond 3-4 months of age combined with features of portal hypertension such as splenomegaly, thrombocytopenia, or prominent superficial abdominal veins; esophageal varices, ascites, and impaired synthetic function are not always present."

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.

PRIOR APPROVAL

Prior approval is required.

POLICY

See Related Medical Policy

- 07.03.05 Small Bowel/Liver and Multivisceral Transplant*

Initial Cadaveric Small Bowel Transplant
A small bowel transplant using a cadaveric intestine may be considered **medically necessary** in adult and pediatric individuals when **all of the following** criteria is met:

- Intestinal failure characterized by loss of absorption *and* the inability to maintain protein-energy, fluid, electrolyte, or micronutrient balance; **and**
- Has established long-term dependency on total parenteral nutrition (TPN); **and**
- The patient is developing or has developed severe complications due to total parenteral nutrition (TPN) to include **one or more of the following**:
    - Development of progressive liver failure due to total parenteral nutrition (TPN) induced liver injury which is felt to be reversible (clinical indications of liver failure include: increased serum bilirubin or liver

enzyme levels, splenomegaly, thrombocytopenia, gastroesophageal varices, coagulopathy, stomal bleeding, hepatic fibrosis or cirrhosis); **or**
    - Frequent episodes of dehydration despite total parenteral nutrition (TPN) and intravenous fluid supplement; **or**
    - Thrombosis of two or more major central venous channels (subclavian, jugular, or femoral veins); **or**
    - Frequent central line related sepsis as evidenced by **one of the following**:
        - Two or more episodes of line-induced systemic sepsis per year; **or**
        - One episode of line-related fungemia, septic shock, or acute respiratory distress syndrome

Not Medically Necessary: Cadaveric Small Bowel Transplant
Small bowel transplantation in adult or pediatric patients would be considered **not medically necessary** in the following indications:

- Who are able to tolerate total parenteral nutrition (TPN)
- Who do not meet the above criteria

Initial Living Donor Small Bowel Transplant
Small bowel transplantation using a *living donor intestine* may be considered **medically necessary** when a cadaveric intestine is *not* available for transplantation in a patient who meets the above criteria for a cadaveric small bowel transplant.

Not Medically Necessary: Living Donor Small Bowel Transplant
Small bowel transplantation in adult and pediatric patients using a *living donor* is considered **not medically necessary** in all other situations.

Retransplant: Cadaveric or Living Donor Small Bowel Transplant
Retransplantation in adult and pediatric patients with failed prior small bowel transplant due to **one of the following** may be considered **medically necessary** if the patient meets the appropriate initial small bowel transplantation criteria above:

- Acute rejection requiring enterectomy (surgical removal of a portion of the intestine); **or**
- Chronic rejection; **or**
- Non-function of grafted organ; **or**
- Return of disease

Policy Guidelines

Potential Contraindications
The following are potential contraindications to a solid organ transplant and are *subject to the judgement of the transplant center*:

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

PROCEDURE CODES AND BILLING GUIDELINES

To report provider services, use appropriate CPT* codes, Alpha Numeric (HCPCS level 2) codes, Revenue codes, and/or ICD diagnosis codes.

- 44135 Intestinal allotransplantation; from cadaver donor
- 44136 Intestinal allotransplantation from living donor

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POLICY HISTORY

Date	Reason	Action
November 2022	Annual Review	Policy Renewed
November 2021	Annual Review	Policy Revised
November 2020	Annual Review	Policy Renewed
November 2019	Annual Review	Policy Renewed
November 2018	Annual Review	Policy Revised
November 2017	Annual Review	Policy Revised
November 2016	Annual Review	Policy Revised

November 2015	Annual Review	Policy Revised
December 2014	Annual Review	Policy Revised
February 2014	Annual Review	Policy Revised
March 2013	Annual Review	Policy Renewed
March 2012	Annual Review	Policy Renewed
April 2011	Annual Review	Policy Revised

New information or technology that would be relevant for Wellmark to consider when this policy is next reviewed may be submitted to:

Wellmark Blue Cross and Blue Shield
Medical Policy Analyst
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