## 7.03.05 Small Bowel/Liver and Multivisceral Transplant

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<th>Effective Date</th>
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<td>7.03 Transplant</td>
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### Description

Small bowel/liver transplantation is transplantation of an intestinal allograft in combination with a liver allograft, either alone or in combination with 1 or more of the following organs: stomach, duodenum, jejunum, ileum, pancreas, or colon.

### Related Policies

- Isolated Small Bowel Transplant

### Policy

A small bowel/liver transplant or multivisceral transplant may be considered **medically necessary** for pediatric and adult patients when all of the following criteria are met:

- Intestinal failure (characterized by loss of absorption and the inability to maintain protein-energy, fluid, electrolyte, or micronutrient balance)
- Have been managed with long-term total parenteral nutrition
- Have developed evidence of impending end stage liver failure

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

A small bowel/liver transplant or multivisceral transplant is considered **investigational** in all other situations.

### Policy Guidelines

#### General

Potential contraindications to solid organ transplant (subject to the judgment of the transplant center):

- Known current malignancy, including metastatic cancer
- Recent malignancy with high risk of recurrence
- History of cancer with a moderate risk of recurrence
- Systemic disease that could be exacerbated by immunosuppression
- Untreated systemic infection making immunosuppression unsafe, including chronic infection
- Other irreversible end stage disease not attributed to intestinal failure
• 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 (adapted from reference 1). (1) Short bowel syndrome is 1 case of intestinal failure.

Candidates should meet the following criteria:
• Adequate cardiopulmonary status
• Documentation of patient compliance with medical management

HIV-positive patients who meet the following criteria, as stated in the 2001 guidelines of the American Society of Transplantation, could be considered candidates for small bowel/liver or multivisceral transplantation:
• CD4 count >200 cells per cubic millimeter for greater than 6 months
• HIV-1 RNA undetectable
• On stable antiretroviral therapy >3 months
• No other complications from AIDS (acquired immune deficiency syndrome) (e.g., opportunistic infection, including aspergillus, tuberculosis, coccidiosis mycosis, resistant fungal infections, Kaposi sarcoma, or other neoplasm), and meeting all other criteria for transplantation.

Small Bowel/Liver Specific

Evidence of intolerance of total parenteral nutrition (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.

Benefit Application

Benefit determinations should be based in all cases on the applicable contract language. To the extent there are any conflicts between these guidelines and the contract language, the contract language will control. Please refer to the member’s contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

Some state or federal mandates (e.g., Federal Employee Program (FEP)) prohibit Plans from denying Food and Drug Administration (FDA) - approved technologies as investigational. In these instances, plans may have to consider the coverage eligibility of FDA-approved technologies on the basis of medical necessity alone.

Rationale

Background

Small bowel transplants are typically performed in patients with short bowel syndrome, 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
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Swallow syndrome is associated with liver failure, often due to the long-term complications of total parenteral nutrition. These patients may be candidates for a small bowel/liver transplant or a multivisceral transplant, which includes the small bowel and liver with 1 or more of the following organs: stomach, duodenum, jejunum, ileum, pancreas, and/or colon. A multivisceral transplant is indicated when anatomic or other medical problems preclude a small bowel/liver transplant.

Literature Review

A 1999 Blue Cross Blue Shield Association Technology Evaluation Center (TEC) Assessment focused on multivisceral transplantation and offered the following conclusions:

Multivisceral transplantation in patients with small bowel syndrome, liver failure, and/or other gastrointestinal problems such as pancreatic failure, thromboses of the celiac axis and the superior mesenteric artery, or pseudo-obstruction affecting the entire gastrointestinal tract is associated with poor patient and graft survival. Pediatric and adult patients have a similar 2- and 5-year survival of 33% to 50%. However, without this procedure, it is expected that these patients would face 100% mortality.

The published literature consists of case series, mainly reported by single centers. Authors of these reports, as well as reviews, observe that while outcomes continue to improve, recurrent and chronic rejection and complications of immunosuppression continue to be obstacles to long-term survival.

In 2010, Nayyar et al reported that there had been improvements in 5-year actuarial patient and graft survival after liver/small bowel transplant since the use of rabbit antithymocyte globulin induction began to be used in their pediatric center in 2002 (81% vs 58% and 76% vs 52%, respectively). In addition to innovations in immunosuppressive therapy, the authors cited new approaches to management of short gut syndrome including hypoallergenic formulas and modification of enteral nutrition to prevent total parenteral nutrition (TPN)-induced cholestasis. The authors noted that better understanding of the protective role of the liver in preventing chronic rejection of the small bowel allograft could improve long-term survival after isolated small bowel transplantation.

Other survival data include a 2009 report by Abu-Elmagd et al reporting on their experience with 500 intestinal and multivisceral transplantations. The study found 1- and 5-year patient survival of 92% and 70%, respectively. A 2013 study from a single center in Sweden included 30 patients accepted for intestinal and multivisceral transplantation. One- and 3-year survival rates were 68% and 61%, respectively. Among patients awaiting transplantation after being accepted as candidates, there was a 34% survival rate. In 2013, Mangus et al reported on 95 patients who underwent multivisceral transplantation with or without liver transplantation at 1 site in the U.S. One-year patient survival was 72% and 3-year survival was 57%. The authors noted a learning curve, with a 48% survival rate for transplants performed between 2004 and 2007 and a 70% survival rate for operations between 2008 and 2010.

Several case series have focused on complications after small bowel and multivisceral transplantation. For example, in 2011 Wu et al reported on 241 patients who underwent intestinal transplantation. Of these, 147 (61%) had multivisceral transplants, 65 (27%) had small bowel transplants, and 12% had small bowel/liver transplants. There were 151 children (63%) and 90 adults. A total of 22 patients (9%) developed graft-versus-host disease. Children younger than 5 years-old were more likely to develop this condition; the incidence in this age group was 16 of 121 (13.2%) compared with 2 of 30 (6.7%) in children between 5 and 18 years and 9 of 90 (4.4%) in adults older than 18 years. In addition, a 2012 article retrospectively reported on bloodstream infections among 98
children younger than age 18 years with small bowel/combined organ transplants.(8) Seventy-seven (79%) patients underwent small bowel transplant in combination with a liver, kidney or kidney-pancreas, and 21 had an isolated small bowel transplant. After a median follow-up of 52 months, 58 (59%) patients remained alive. The 1-year survival rate was similar in patients with combined small bowel transplant (75%) and those with isolated small bowel transplant (81%). In the first year after transplantation, 68 patients (69.4%) experienced at least 1 episode of bloodstream infection. The 1-year survival rate for patients with bloodstream infections was 72% compared with 87% in patients without bloodstream infections (p=0.056 for difference in survival in patients with and without bloodstream infections).

A 2014 single-center Italian case series reported on transplants in 45 patients who received either intestinal transplants alone or a combined transplant procedure.(9) Twelve of the patients had small bowel/multivisceral transplants. Five of these had the procedure due to short-bowel syndrome, 2 had chronic intestinal pseudo-obstruction, and 5 had Gardner syndrome. Survival rates for the entire patient population were 77% at 1 year, 58% at 3 years, 53% at 5 years, and 37% at 10 years.

**HIV-Positive Transplant Recipients**

This subgroup of recipients has long been controversial, due to the long-term prognosis for HIV positivity and the impact of immunosuppression on HIV disease. Although HIV-positive transplant recipients may be a research interest of some transplant centers, the minimal data regarding long-term outcome in these patients primarily consist of case reports and abstract presentations of liver and kidney recipients. Nevertheless, some transplant surgeons would argue that HIV positivity is no longer an absolute contraindication to transplant due to the advent of highly active antiretroviral therapy, which has markedly changed the natural history of the disease. In 2001, the Clinical Practice Committee of the American Society of Transplantation proposed that the presence of AIDS could be considered a contraindication to kidney transplant unless the following criteria were present:(10) These criteria may be extrapolated to other organs:

- **CD4 count greater than 200 cells/mm-3 for more than 6 months**
- **HIV-1 RNA undetectable**
- **On stable antiretroviral therapy for more than 3 months**
- **No other complications from AIDS (e.g., opportunistic infection, including aspergillus, tuberculosis, coccidiose mycosis, resistant fungal infections, Kaposi's sarcoma, or other neoplasm).**
- **Meeting all other criteria for transplantation**

In 2006, the British HIV Association and the British Transplantation Society Standards Committee published guidelines for kidney transplantation in patients with HIV disease.(11) As previously described, these criteria may be extrapolated to other organs. The guidelines, which are similar to those cited here, recommend that any patient with end stage organ disease with a life expectancy of at least 5 years is considered appropriate for transplantation under the following conditions:

- **CD4 greater than 200 cells/mL for at least 6 months**
- **Undetectable HIV viremia (<50 HIV-1 RNA copies/mL) for at least 6 months**
- **Demonstrable adherence and a stable HAART regimen for at least 6 months**
• Absence of AIDS-defining illness following successful immune reconstitution after HAART

Furthermore, as of November 2010, the United Network for Organ Sharing policy on identification of transmissible diseases in organ recipients states, "A potential candidate for organ transplantation whose test for HIV is positive should not be excluded from candidacy for organ transplantation unless there is a documented contraindication to transplantation based on local policy."(12)

No studies that reported on outcomes in HIV-positive patients who received small bowel/liver or multivisceral transplants have been identified in literature reviews.

Retransplantation

In 2012, Trevizol et al published a review of literature from the previous 5 years on intestinal and multivisceral retransplantation.(13) The authors found articles from 2 centers. Mazariegos et al reported on 15 retransplantations in 14 pediatric patients.(14) By the end of follow-up, 4 patients had died and 10 patients had a normal graft function. TPN was weaned at a mean of 32 days after retransplantation. A 2009 study by Abu-Elmagd et al, discussed earlier,(4) reported 47 retransplants after 500 intestinal and multivisceral transplantations in adults and children. Included were 31 intestinal retransplants, 9 multivisceral retransplants, and 7 intestinal/liver retransplants. For all types of retransplants combined, there is a 5-year survival rate of 47% for all retransplants.

Desai et al reported intestinal retransplantation data from the Organ Procurement and Transplant Network database.(15) Between October 1987 and August 2009, there were 31 cases of small bowel/liver retransplants in adults and 49 in children. Among adults, 1-, 3-, and 5-year survival rates after retransplantation were 63.1%, 56.1%, and 46.8%, respectively. This compares with survival rates after primary small bowel/liver transplants of 67%, 53.3%, and 46% at 1, 3, and 5 years. Among children, there was a 42.1% survival rate at 1, 3, and 5 years after retransplantation. Survival rates after primary small bowel/liver transplantation was 67.6%, 56.1%, and 51.4% respectively.

Summary

Evidence for small bowel/liver and multivisceral transplant and retransplant consists of case series. Though infrequently performed, the transplant procedures are demonstrated to provide a survival benefit, and the procedure is considered medically necessary for patients who have been managed with long-term total parenteral nutrition and who have developed evidence of impending end-stage liver failure.

Medicare National Coverage

Medicare will cover intestinal transplantation for the purposes of restoring intestinal function in patients with irreversible intestinal failure only when performed for patients who have failed total parenteral nutrition and only when performed in centers that meet approved criteria.(16) The criteria for approval of centers will be based on an annual volume of 10 intestinal transplants per year with a 1-year actuarial survival of 65% (these criteria were reviewed again in 2006 and upheld).

References


**Documentation Required for Clinical Review**

- Referring physician history and physical
- Gastroenterologist and/or Hepatology consultation report and/or progress notes documenting:
  - Diagnosis (including disease staging) and prognosis
  - Synopsis of alternative treatments performed and results
  - Specific transplant type being requested
- Surgical consultation report and/or progress notes
- Results of completed transplant evaluation including:
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- Clinical history
- Specific issues identified during the transplant evaluation
- Consultation reports/letters (when applicable)
- Correspondence from referring physicians (when applicable)
- Identification of donor for living liver transplant (when information is available)

- Medical social service/social worker and/or psychiatric (if issues are noted) evaluations including psychosocial assessment or impression of patient's ability to be an adequate candidate for transplant

- Radiology reports including:
  - Abdominal CT, ultrasound, and/or MRI
  - CXR

- GI procedure reports:
  - Colonoscopy if > 50 years of age
  - EGD

- Cardiology procedures and respiratory function reports:
  - EKG
  - Cardiac echocardiogram, stress test, and cardiac catheterization (if indicated)
  - Pulmonary function tests (PFTs)

- Laboratory reports

**Coding**

This Policy relates only to the services or supplies described herein. Benefits may vary according to benefit design; therefore, contract language should be reviewed before applying the terms of the Policy. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement.

**MN/IE**

The following service/procedure may be considered medically necessary in certain instances and investigational in others. Services may be medically necessary when policy criteria are met. Services are considered investigational when the policy criteria are not met or when the code describes application of a product in the position statement that is investigational.

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<thead>
<tr>
<th>Type</th>
<th>Code</th>
<th>Description</th>
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<tr>
<td>CPT®</td>
<td>44120</td>
<td>Enterectomy, resection of small intestine; single resection and anastomosis</td>
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<td></td>
<td>44121</td>
<td>Enterectomy, resection of small intestine; each additional resection and anastomosis (List separately in addition to code for primary procedure)</td>
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<td>Code</td>
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<tr>
<td>44132</td>
<td>Donor enterectomy (including cold preservation), open; from cadaver donor</td>
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<td>44133</td>
<td>Donor enterectomy (including cold preservation), open; partial, from living donor</td>
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<tr>
<td>44715</td>
<td>Backbench standard preparation of cadaver or living donor intestine allograft prior to transplantation, including mobilization and fashioning of the superior mesenteric artery and vein</td>
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<td>44720</td>
<td>Backbench reconstruction of cadaver or living donor intestine allograft prior to transplantation; venous anastomosis, each</td>
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<td>44721</td>
<td>Backbench reconstruction of cadaver or living donor intestine allograft prior to transplantation; arterial anastomosis, each</td>
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<td>Donor hepatectomy (including cold preservation), from cadaver donor</td>
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<td>47135</td>
<td>Liver allotransplantation; orthotopic, partial or whole, from cadaver or living donor, any age</td>
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<td>47136</td>
<td>Liver allotransplantation; heterotopic, partial or whole, from cadaver or living donor, any age</td>
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<td>Donor hepatectomy (including cold preservation), from living donor; left lateral segment only (segments II and III)</td>
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<td>Donor hepatectomy (including cold preservation), from living donor; total left lobectomy (segments II, III and IV)</td>
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<td>47142</td>
<td>Donor hepatectomy (including cold preservation), from living donor; total right lobectomy (segments V, VI, VII and VIII)</td>
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<td>47143</td>
<td>Backbench standard preparation of cadaver donor whole liver graft prior to allotransplantation, including cholecystectomy, if necessary, and dissection and removal of surrounding soft tissues to prepare the vena cava, portal vein, hepatic artery, and common bile duct for implantation; without trisegment or lobe split</td>
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<tr>
<td>47144</td>
<td>Backbench standard preparation of cadaver donor whole liver graft prior to allotransplantation, including cholecystectomy, if necessary, and dissection and removal of surrounding soft tissues to prepare the vena cava, portal vein, hepatic artery, and common bile duct for implantation; with trisegment split of whole liver graft into 2 partial liver grafts (i.e., left lateral segment [segments II and III] and right trisegment [segments I and IV through VIII])</td>
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| 47145  | Backbench standard preparation of cadaver donor whole liver graft prior to allotransplantation, including cholecystectomy, if necessary, and dissection and removal of surrounding soft tissues to prepare the vena cava, portal vein, hepatic artery, and common bile duct for implantation; with lobe split of whole
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<td>S2053</td>
<td>Transplantation of small intestine and liver allografts</td>
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<td>S2054</td>
<td>Transplantation of multivisceral organs</td>
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<tr>
<td>S2055</td>
<td>Harvesting of donor multivisceral organs, with preparation and maintenance of allografts; from cadaver donor</td>
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<th>ICD-9 Procedure</th>
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<tr>
<td>45.63</td>
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<td>Transplantation of Small Intestine, Allogeneic, Open Approach</td>
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<td>Transplantation of Large Intestine, Allogeneic, Open Approach</td>
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<td>0FYG0Z0</td>
<td>Transplantation of Pancreas, Allogeneic, Open Approach</td>
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Policy History

This section provides a chronological history of the activities, updates and changes that have occurred with this Medical Policy.

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<tr>
<td>11/26/2014</td>
<td>Policy title change from Small Bowel Transplantation</td>
<td>Medical Policy Committee</td>
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<td>Policy revision with position change</td>
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Definitions of Decision Determinations

Medically Necessary: A treatment, procedure or drug is medically necessary only when it has been established as safe and effective for the particular symptoms or diagnosis, is not investigational or experimental, is not being provided primarily for the convenience of the patient or the provider, and is provided at the most appropriate level to treat the condition.
Investigational/Experimental: A treatment, procedure or drug is investigational when it has not been recognized as safe and effective for use in treating the particular condition in accordance with generally accepted professional medical standards. This includes services where approval by the federal or state governmental is required prior to use, but has not yet been granted.

Split Evaluation: Blue Shield of California / Blue Shield of California Life & Health Insurance Company (Blue Shield) policy review can result in a Split Evaluation, where a treatment, procedure or drug will be considered to be investigational for certain indications or conditions, but will be deemed safe and effective for other indications or conditions, and therefore potentially medically necessary in those instances.

Prior Authorization Requirements
This service (or procedure) is considered medically necessary in certain instances and investigational in others (refer to policy for details).

For instances when the indication is medically necessary, clinical evidence is required to determine medical necessity.

For instances when the indication is investigational, you may submit additional information to the Transplant Case Management Department.

Within five days before the actual date of service, the Provider MUST confirm with Blue Shield that the member's health plan coverage is still in effect. Blue Shield reserves the right to revoke an authorization prior to services being rendered based on cancellation of the member's eligibility. Final determination of benefits will be made after review of the claim for limitations or exclusions.

Questions regarding the applicability of this policy should also be directed to the Transplant Case Management Department. Please call 1-800-637-2066 ext. 3507708 or visit the Provider Portal www.blueshieldca.com/provider.

The materials provided to you are guidelines used by this plan to authorize, modify, or deny care for persons with similar illness or conditions. Specific care and treatment may vary depending on individual need and the benefits covered under your contract. These Policies are subject to change as new information becomes available.