Kansas City

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Small Bowel, Liver and Multivisceral Transplant

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Next Review: 11/2014

Policy

Blue Cross and Blue Shield of Kansas City (Blue KC) will provide coverage for Small Bowel/Liver and Multivisceral Transplant when it is determined to be medically necessary because the criteria shown below are met.

When Policy Topic is covered

A small bowel/liver transplant or multivisceral transplant may be considered **medically necessary** for pediatric and adult patients 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 total parenteral nutrition (TPN) and who 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.

When Policy Topic is not covered

A small bowel/liver transplant or multivisceral transplant not meeting the medical necessity criteria above is considered **not medically necessary**.

Considerations

General

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

1. Known current malignancy, including metastatic cancer
2. Recent malignancy with high risk of recurrence
3. History of cancer with a moderate risk of recurrence
4. Systemic disease that could be exacerbated by immunosuppression
5. Untreated systemic infection making immunosuppression unsafe, including chronic infection
6. Other irreversible end-stage disease not attributed to intestinal failure
7. 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 one case of intestinal failure.

Candidates should meet the following criteria:

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

HIV [human immunodeficiency virus]-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 greater than 200 cells per cubic millimeter for greater than 6 months
- HIV-1 RNA undetectable
- On stable anti-retroviral 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's 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.

Small bowel / liver and multivisceral transplants should be considered for coverage under the Transplant Benefit.

Transplant Benefit
The date on which the Transplant Benefit starts accumulating is determined by the transplant coordinator. The Transplant Benefit ends when the Transplant Lifetime Maximum benefit (if applicable) has been exhausted.

Benefits include:
- hospitalization of the recipient for medically recognized transplants from a donor to a transplant recipient;
- evaluation tests requiring hospitalization to determine the suitability of both potential (member's benefits must be verified with regard to the potential donor who does not turn out to be the actual donor) and actual donors, when such tests cannot be safely and effectively performed on an outpatient basis (**Note**: The member's benefits must be verified with regard to the **potential** donor who does not turn out to be the **actual** donor.);
- hospital room, board and general nursing in semi-private rooms;
- special care units, such as coronary and intensive care;
- hospital ancillary services;
- physicians' services for surgery, technical assistance, administration of anesthetics, and medical care;
- acquisition, preparation, transportation, and storage of organ / tissue / cells;
- diagnostic services;
- drugs which require a prescription by federal law;
- medical and surgical care of the donor (related to the procurement of the organ / tissue / cells) if coverage is not available to the donor from any other source. (Covered services provided to a donor will be applied against the recipient's transplant maximum benefit, if applicable)

If the donor and recipient are both listed on the same (family) policy, BCBSKC charges only one deductible and one coinsurance, if applicable.

In addition to the specific organ criteria, transplant candidates must also meet the following general criteria, including, but not limited to:
- Since compliance is a major factor in transplant graft survival, the patient (or legal guardian) must have the ability to accept and understand the transplant procedure and to maintain compliance with long-term medical management and immunosuppression.
- If applicable, patients with a history of malignancy must have passed the recommended length of time to be considered cured for that specific cancer. A complete metastatic evaluation must be performed before a patient will be considered an acceptable transplant candidate.
- Patients with a history of alcohol or substance abuse must have a six month history of abstinence as evidenced by negative urine or serum drug screens taken randomly.

- The patient must have adequate cardiopulmonary status.
- The patient must be free from active infection.

A covered person is eligible for retransplantation as deemed medically necessary and appropriate by Blue Cross and Blue Shield of Kansas City (Blue KC). Review of a retransplantation request will include review of the covered person's compliance with relevant transplant selection criteria including, but not limited to, adherence to medication regimens, follow-up examinations and abstinence from the use of alcohol and drugs.

The specific member contracts should be reviewed for coverage related to donors and recipients, out of network treatment, drugs and other possible limitations or exclusions.

Coverage will **not** provided for:
- Transplant services for which the cost is covered by government, foundation, or charitable grants
- The purchase price of organs which are sold rather than donated to the recipient
- an artificial organ.

Clinical trials for conditions other than those allowed in this policy may be available in the research setting. However, these trials are considered investigational and/or experimental and therefore contract exclusions.

Note: There are some state mandates in place that require insurance carriers to cover certain clinical trials under very specific guidelines. Please contact your BCBSKC representative for more information.

Due to the special nature of this procedure, this transplant may require an out of network exception.

Description of Procedure or Service

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

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 bowel syndrome is associated with liver failure, often due to the long-term complications of total parenteral nutrition (TPN). 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.

Note: Isolated small bowel transplants are considered in a separate policy.

Rationale

This policy was originally created in 1995 and was updated regularly with searches of the MEDLINE database. The most recent literature search was performed for the period April 2012 through April 30, 2013.

A 1999 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 associated with poor patient and graft survival. Pediatric and adult patients have a similar 2- and 5-year survival of 33–50%. However, without this procedure, it is expected that these patients would face 100% mortality. (2)

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 and colleagues 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 (rATG) induction began to be used in their pediatric center in 2002 (81% vs. 58% and 76% vs. 52%, respectively). (3) 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 and colleagues reporting on their experience with 500 intestinal and multivisceral transplantations. (4) 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. (5) 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 and colleagues reported on 95 patients who underwent multivisceral transplantation with or without liver transplantation at one site in the U.S. (6) 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 and colleagues reported on 241 patients who underwent intestinal transplantation. (7) 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 (GVHD). Children younger than 5-years-old were more likely to develop GVHD; the incidence in this age group was 16 of 121 (13.2%) compared to 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 one episode of bloodstream infection. The 1-year survival rate for patients with bloodstream infections was 72% compared to 87% in patients without bloodstream infections (p value= .056 for difference in survival in patients with and without bloodstream infections).

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 (HAART), 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. (9) 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, coccidioses 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. (10) As described above, 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 (UNOS) 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." (11)

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

Retransplantation

In 2012, Trevizol and colleagues published a review of literature from the previous 5 years on intestinal and multivisceral retransplantation. (12) The authors found articles from 2 centers. Mazariegos and colleagues reported on 15 retransplantations in 14 pediatric patients. (13) 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 and colleagues, 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 and colleagues reported intestinal retransplantation data from the Organ Procurement and Transplant Network (OPTN) database. (14) 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 to 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 (TPN) and only when performed in centers that meet approved criteria. (15) 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

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15. Center for Medicare and Medicaid Services. Intestinal and multi-visceral transplantation. Available online at: www.cms.gov.

Billing Coding/Physician Documentation Information

44120 Enterectomy, resection of small intestine; single resection and anastomosis
44121 Enterectomy, resection of small intestine; each additional resection and anastomosis (List separately in addition to code for primary procedure)
44799 Unlisted procedure, intestine
47133 Donor hepatectomy (including cold preservation), from cadaver donor
47135 Liver allotransplantation; orthotopic, partial or whole, from cadaver or living donor, any age
47136 Liver allotransplantation; heterotopic, partial or whole, from cadaver or living donor, any age
47140 Donor hepatectomy (including cold preservation), from living donor; left lateral segment only (segments II and III)
47141 Donor hepatectomy (including cold preservation), from living donor; total left lobectomy (segments II, III and IV)
47142 Donor hepatectomy (including cold preservation), from living donor; total right lobectomy (segments V, VI, VII and VIII)

47143 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

47144 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 two partial liver grafts (ie, left lateral segment (segments II and III) and right trisegment (segments I and IV through VIII))

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 liver graft into two partial liver grafts (ie, left lobe (segments II, III, and IV) and right lobe (segments I and V through VIII))

47146 Backbench reconstruction of cadaver or living donor liver graft prior to allotransplantation; venous anastomosis, each

47147 Backbench reconstruction of cadaver or living donor liver graft prior to allotransplantation; arterial anastomosis, each

S2053 Transplantation of small intestine, and liver allografts

S2054 Transplantation of multivisceral organs

S2055 Harvesting of donor multivisceral organs, with preparation and maintenance of allografts; from cadaver donor

Additional Policy Key Words

N/A

Policy Implementation/Update Information

11/1/01 New policy. Added to the surgery section.

11/1/02 No policy statement changes. Added to the transplant section.

11/1/03 No policy statement changes. Added new HCPCPS codes.

11/1/04 Policy statement revised to include HIV+ status as investigational.

11/1/05 Policy statement revised to remove HIV+ status as investigational.

4/1/06 No policy statement changes. Added general criteria to the considerations section.

11/1/06 No policy statement changes.

11/1/07 No policy statement changes.

11/1/08 No policy statement changes.

11/1/09 No policy statement changes.

11/1/10 No policy statement changes.

11/1/11 Policy statement revised to list absolute contraindications as not medically necessary.

11/1/12 Contraindications combined (absolute and relative) and moved to Considerations section. Wording of contraindications changed to be consistent with other solid organ transplant policies.

11/1/13 Statement added that small bowel/liver transplant or multivisceral retransplant may be considered medically necessary after a failed primary small bowel/liver transplant or multivisceral transplant.