

MEDICAL POLICY

Medical Policy Title	Small Bowel and Multivisceral Transplants in Adults and Children
Policy Number	07.02.05
Current Effective Date	March 19, 2026
Next Review Date	March 2027

Our medical policies are guides to evaluate technologies or services for medical necessity. Criteria are established through the assessment of evidence based, peer-reviewed scientific literature, and national professional guidelines. Federal and state law(s), regulatory mandates and the member's subscriber contract language are considered first in the determination of a covered service.

(Link to [Product Disclaimer](#))

POLICY STATEMENT(S)

- I. Candidates for Small Bowel (SB) or Multivisceral (MV) transplant must meet **ALL** of the following criteria:
 - A. Adequate cardiopulmonary status;
 - B. Absence of active infection;
 - C. Absence of malignancy (other than non-melanoma skin cancers), unless malignancy has been completely resected, or (upon medical review) it is determined that malignancy has been treated with small likelihood of recurrence and acceptable future risks;
 - D. Documentation of patient compliance with medical management; **and**
 - E. Meet **ALL** of the transplant specific criteria:

Small Bowel Transplant

1. Small bowel (SB) transplantation is considered **medically appropriate** in pediatric and adult patients with short bowel syndrome (SBS) for **ANY** of the following indications:
 - a. Impending or overt liver failure due to total parenteral nutrition (TPN)-induced liver injury;
 - b. Thrombosis of two (2) or more central veins;
 - c. Two (2) or more episodes per year of systemic sepsis secondary to line infection that require hospitalization;
 - d. A single episode of line-related fungemia, septic shock, or acute respiratory distress syndrome; **or**
 - e. Frequent episodes of severe dehydration, despite intravenous fluid supplementation in addition to TPN;
2. SB transplant is considered **investigational** for **BOTH** of the following:
 - a. Being considered for adult or pediatric individuals with intestinal failure who can tolerate TPN; **and**

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- b. SB transplant using live donor tissue.

Multivisceral Transplant

3. Multivisceral (MV) transplantation is considered **medically appropriate** in pediatric and adult patients with intestinal failure **AND** concurrent liver failure.

RELATED POLICIES

Corporate Medical Policy

7.02.07 Liver Transplantation

11.01.03 Experimental or Investigational Services

11.01.04 Total Parenteral Nutrition or Hyperalimentation

POLICY GUIDELINE(S)

- I. Pre-transplant evaluation documentation should include the following clinical information (if testing is unable to be performed, the rationale for not performing the testing should be included in the documentation):
 - A. Clinical Evaluation:
 1. Confirmation of diagnosis;
 2. Identification of comorbidities;
 3. Current assessment of co-morbidities;
 4. Management of co-morbidities; **and**
 5. Consult notes (if applicable);
 - B. Psycho-Social Evaluation:
 1. Identification of stressors (e.g., family support, noncompliance issues, motivational issues, alcohol, or smoking/substance abuse);
 - C. Performance Status:
 1. Karnofsky performance score;
 2. Palliative Performance Scale (PPS) score;
 3. Eastern Cooperative Oncology Group (ECOG) performance status; **or**
 4. Lansky Play-Performance Scale (for age 1 to 16 years);
 - D. Oral Health Evaluation;
 - E. Lab Tests:
 1. CBC, metabolic profile;
 2. Serologies: CMV, Hepatitis B and C; **and**

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3. HIV Testing;
 - F. Cardiac Assessment:
 1. 12 Lead EKG;
 2. Stress (exercise, nuclear, or dobutamine), **and**
 3. Echo or MUGA Scan;
 - G. Pulmonary Assessment:
 1. Chest x-ray;
 2. Pulmonary function tests (PFTs); for high-risk for respiratory failure (COPD, emphysema, alpha-1-antritypsin deficiency, hepatopulmonary syndrome, or significant smoking history); **and**
 - H. Age-Appropriate Screening Tests: Please refer to the U.S Preventive Services Task Force (USPSTF) website for list of age-appropriate screening guidelines. [accessed 2026 Jan 30]. Available from: <https://uspreventiveservicestaskforce.org/uspstf/>
- II. Small Bowel and Multivisceral Transplants are considered a relative contraindication in human immunodeficiency virus (HIV) positive recipients, unless **ALL** of the following criteria are met:
- A. Patient's CD4 count is greater than 200 cells/mm³;
 - B. HIV-1RNA is undetectable;
 - C. Patient has been on stable anti-retroviral therapy for greater than three (3) months;
 - D. Patient has no other complications from AIDS (e.g., opportunistic infection, including aspergillus, tuberculosis, coccidioidomycosis; resistant fungal infections, Kaposi's sarcoma, or other neoplasm); and
 - E. Patient meets all other criteria for transplantation.

DESCRIPTION

Small Bowel Transplant

The purpose of a small bowel (SB) transplant is to restore bowel function and allow for adequate nutrition in patients with short bowel syndrome (SBS). It may be an alternative to total parenteral nutrition (TPN) for selected patients who are predicted to have poor survival on TPN. SBS is a condition in which the absorbing surface of the small intestine is inadequate due to extensive disease or surgical removal. The spectrum of clinical disease varies widely, 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. The actual prevalence of short bowel syndrome is not clear primarily due to under-reporting and a lack of reliable patient databases.

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Multivisceral Transplant (MV)

MV is the most extensive form of intestinal transplant, and an infrequently performed procedure, but, without it, most candidates, candidates will likely face 100% mortality. MV includes the simultaneous transplant of multiple abdominal organs that are reliant on the celiac axis and superior mesenteric artery, including the stomach, duodenum, pancreas, and small intestine, with or without the liver (modified multivisceral transplant). Some centers may also include the colon or elect to simultaneously remove the spleen. Organs selected in addition to the small intestine are dependent upon the patient's specific disease.

Candidates for MV transplant have SBS and terminal liver failure or other gastrointestinal problems, such as pancreatic failure, thromboses of the celiac axis and the mesenteric artery, or pseudo-obstruction affecting the entire gastrointestinal tract.

Total parenteral nutrition (TPN) is the only established treatment that can produce long-term survival, once the small intestine is dysfunctional, and oral nutrition is ineffective. TPN requires placement of a permanent venous access device. There are some serious, life-threatening complications that can occur as a result of TPN, including hepatobiliary disease, thrombosis due to the venous catheter, or sepsis from the venous access line.

SUPPORTIVE LITERATURE

There are limited long-term data on SB and MV transplants, due to the small numbers of transplantations performed. Intestinal transplants (including multivisceral and bowel/liver) represent a small minority of all solid organ transplants. In 2024, 80 intestinal transplants were performed in the U.S. according to the U.S. Department of Health and Human Services (DHHS) Organ Procurement and Transplantation Network National Data 2024. The number of new patients added to the intestinal transplant waiting list as of January 30, 2026, was 200.

Sudan (2010) published a review of the literature on long-term outcomes after intestinal transplantation. 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%.

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.

In 2022, Roberts et al conducted a multicenter international cohort study to validate the Toronto criteria (Burghardt et al 2015), a set of pediatric criteria for intestinal transplantation which included 1) two or more intensive care unit admissions requiring ventilatory or inotropic support, 2) loss of three or more out of six central venous catheter sites, and 3) persistent elevation of conjugated bilirubin ($\geq 75\mu\text{mol/L}$) following six weeks of lipid management strategies. The Toronto criteria was based on the experiences of a single center. Roberts and colleagues aimed to prove that the data

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could be generalized to all pediatric patients with intestinal failure by reviewing a cohort of 443 patients who were included in the study if they were less than 18 years of age at the time of diagnosis, and with intestinal failure due to a primary gastrointestinal disorder (e.g., short bowel syndrome, motility disorder or congenital diarrhea, and enteropathy). Excluded were patients with a malignancy, metabolic, or mitochondrial disease, or any other independently life-limiting condition. Follow-up was one year, at a minimum. Patient data was collected from hospital records and included patient status at the end of the study (alive, dead or transplanted) for each of the proposed listing criteria, which was similar to the Burghadt criteria but did extend the length of lipid strategies to 8 weeks and also separated central venous catheter sites into upper and lower body sites, and upper body sites only. Validation of the criteria was done by calculating the sensitivity, specificity, negative predictive value (NPV), positive predictive value (PPV), and probability of death or transplant for each of the criteria. Median age at the diagnosis of intestinal failure was 0.1 years (Interquartile ratio (IQR) 0.03-0.14) with median follow up of 3.8 years (IQR 2.3-5.3). A total of 9% (40/443) of patients died, 12 % (53/443) were transplanted. A total of 11 patients died post-transplant. The criteria had a high predictive value of death and intestinal transplantation ($p < .0001$, 95% Confidence Interval). Authors concluded that although the study was of lower statistical power, the outcomes confirm the results of the single center cohort, thereby confirming the validity of the three proposed Toronto listing criteria for intestinal transplant in children.

Living donor isolated or combined liver/intestinal transplants have been studied in very small case studies. Typically, living donor transplants have been reserved for children who are at high risk for premature death while on the cadaveric waiting list and who have no central venous access, or for children with impending TPN-related liver failure (Gangemi 2009). A living donor liver transplant may be performed first, followed by an intestinal transplant from the same donor later. Advantages to living donors' transplants include better human leukocyte antigen (HLA) matching, reduction of cold ischemia time, and no waitlisting for a transplant; thus, the patient is less likely to die while waiting for an organ. Results from the studies showed few or no complications for the donor after transplant. Most complications for the recipient, such as diarrhea, weight loss, and nausea, were resolved within a few weeks of surgery. However, these small studies are lacking long-term follow-up of the donors.

Patient survival and graft survival for recipients of living donor combined liver/intestinal or isolated intestinal transplants has been favorable. More large studies are needed, to determine whether patient survival rate is comparable to or better than the survival rate for patients receiving cadaveric organs. Most studies suggest that living donor-transplanted organs are to be reserved for circumstances in which there is high risk for death, and no cadaveric donors are available.

PROFESSIONAL GUIDELINE(S)

In 2001, the American Society of Transplantation issued a position paper on indications for pediatric intestinal transplantation (Iyer 2022). The Society listed the following disorders in children as being potentially treatable by intestinal transplantation: short bowel syndrome, defective intestinal motility, and impaired enterocyte absorptive capacity. Contraindications for intestinal transplants to treat pediatric patients with intestinal failure are similar to those of other solid organ transplants: profound neurologic disabilities, life-threatening comorbidities, severe immunologic deficiencies, nonresectable malignancies, autoimmune diseases, and insufficient vascular patency.

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In 2022, the American Gastroenterological Association (AGA) (Iyer 2022) published a clinical practice update on the management of short bowel syndrome. The guidance recommends referral for intestinal transplantation for “patients with intestinal failure (i.e., refractory parenteral nutrition dependency) and onset of parenteral nutrition failure, especially the occurrence of progressive intestinal failure-associated liver disease or catheter related complications such as recurrent catheter-related sepsis or loss of vascular access due to thrombosis of the central veins.” The guidance stresses wider adoption of pre-emptive intestinal transplant, before parenteral nutrition complications are an issue, including such patients who do not meet the strict historical criteria of parenteral nutrition failure (e.g., severe dysmotility syndromes who are not anticipated to ever wean from PN, and those with large abdominal desmoid tumors). Regarding the use of intestinal transplantation in pediatric patients, authors noted that the document focus is on adult patients, “however, some overlap with the management of pediatric short bowel syndrome may be present”.

In 2001, the United Network for Organ Sharing (UNOS) indicated that asymptomatic HIV-positive patients should not necessarily be excluded from candidacy for organ transplantation, stating, “A potential candidate for organ transplantation whose test for HIV is positive but who is in an asymptomatic state should not necessarily be excluded from candidacy for organ transplantation, but should be advised that he or she may be at increased risk of morbidity and mortality because of immunosuppressive therapy.”

In 2013, the American Association for the Study of Liver Diseases and the American Society of Transplantation published practice guidelines related to the evaluation of liver transplantation in adults. More than 50 recommendations were included, the strength of the recommendations were classified as strong, or weak and the quality of evidence was rated as high (A), moderate (B), or Low (C). Level 1-A recommendations include the following:

- “Evaluation for LT should be considered once a patient with cirrhosis has experienced an index complication such as ascites, hepatic encephalopathy, or variceal hemorrhage or hepatocellular dysfunction results in a MELD Score ≥ 15 .
- Potential recipients with portopulmonary hypertension (POPH) should be evaluated by a pulmonary or cardiac specialist for vasodilator therapy.
- HPS is relatively common in patients evaluated for LT and should be screened by pulse oximetry.
- Renal dysfunction requires vigorous evaluation prior to LT to determine etiology and prognosis.
- Tobacco consumption should be prohibited in LT candidates.
- Candidates should undergo age and risk factor-appropriate cancer screening, e.g., colono-scopy, mammography, Papanicolaou smear.
- LT candidates should be screened for bacterial, viral, and fungal infections prior to LT.
- Vaccination should be encouraged against pneumococcus, influenza, diphtheria, pertussis, and tetanus.
- Bone densitometry should be obtained as part of transplant evaluation and treatment of osteoporosis initiated prior to LT.

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- Nutritional assessment should be performed in every LT candidate.
- Patients with HIV infection are candidates for LT if immune function is adequate and the virus is expected to be undetectable by the time of LT.
- Patients should be evaluated for and meet reasonable expectations for adherence to medical directives and mental health stability as determined by the psychosocial evaluation.
- LT transplant candidates with HCV have the same indications for LT as for other etiologies of cirrhosis.
- Patients with HBV (hepatitis B) liver disease should receive antiviral therapy to suppress HBV replication pre-transplant and continued surveillance for HCC.
- LT is indicated for decompensated primary biliary cirrhosis (PBC).
- LT should be considered in patients with decompensated autoimmune hepatitis who do not respond to or are not appropriate candidates for medical therapies.
- LT is an effective therapy for decompensated liver disease due to primary sclerosing cholangitis (PSC), including bouts of recurrent cholangitis and sepsis.
- Early referral of ALD patients for initiation of LT evaluation facilitates psychosocial assessment and setting addiction treatment goals.
- Patients with acute liver failure (ALF) require immediate referral to a liver transplant center.
- Patients with acetaminophen overdose should be evaluated for and meet reasonable expectations for adherence to medical directives and mental health stability as determined by the psychosocial evaluation.
- LT is an effective therapy for Hepatocellular carcinoma (HCC) within the Milan criteria.
- LT is an effective therapy for decompensated liver disease due to non-alcoholic steatohepatitis (NASH) or cryptogenic cirrhosis.
- LT is indicated for decompensated cirrhosis due to α -1-antitrypsin deficiency.
- Screening to exclude lung disease with pulmonary function tests and chest imaging should be undertaken in patients with α -1-antitrypsin deficiency being evaluated for LT.
- Urgent LT is indicated for Wilsonian acute liver failure.
- LT is indicated in decompensated cirrhosis due to Wilson's disease unresponsive to medical therapy.
- LT is indicated for decompensated cirrhosis due to hemochromatosis.
- Preemptive LT (prior to the development of advanced renal disease) or combined liver and kidney transplantation in the setting of ESRD are curative for primary hyperoxaluria and should be considered for patients who do not respond to medical therapy."

In 2014, the North American Society of Transplantation and the North American Society for Pediatric Gastroenterology, Hepatology & Nutrition published AASLD practice guidelines for the evaluation of

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the pediatric patient for liver transplant (LT) (with liver transplant included within the definition of multivisceral transplants). Over 90 recommendations were included, the strength of the recommendations were classified as strong, or weak and the quality of evidence was rated as high (A), moderate (B), or Low (C), including, but not limited to, the following:

- “A multidisciplinary pediatric LT evaluation team should be skilled in pediatric conditions and properly communicate with the family and the child, when appropriate, the processes, risks, and benefits associated with LT. (2-B)
- Immediate contact with pediatric LT center should be initiated for children with acute liver failure or acute decompensation of an established liver disease; emergent referral for LT evaluation may be required. (1-A)
- Children with liver-based metabolic crises refractory to medical and/or surgical therapy (1-B), unresectable hepatoblastoma (1-B), or evidence of hepatocellular unresectable carcinoma (1-B) should be referred urgently for LT evaluation.
- Biliary atresia (BA) patients who are post-hepatoportenterostomy (HPE) should be promptly referred for LT evaluation if the total bilirubin is greater than 6mg/dL beyond 3 months from HPE. (1-B); liver transplant evaluation should be considered in BA patients whose total bilirubin remains between 2-6 mg/dL. (1-B)
- Referral for LT evaluation should be anticipated for children with chronic liver disease and evidence of deteriorating liver function characterized by poor weight gain, growth failure, variceal hemorrhage, intractable ascites, recurrent cholangitis, or episodes of spontaneous bacterial peritonitis, pruritus, advancing encephalopathy, and/or uncorrectable coagulopathy (1-B).
- A review of the local records by the LT team prior to LT evaluation will inform the evaluation schedule and enable affirmation of the primary diagnosis, assessment of comorbidities, and identify technical challenges related to LT. (2-B)
- In collaboration with the local primary pediatric specialist, management of the primary disease and comorbidities should be reviewed and optimized. (2-B)
- Aggressive nutritional support for children awaiting LT should be initiated to optimize outcomes (1-B); NG tube feedings and parenteral nutrition may be needed in some circumstances. (2-B)
- Two-dimensional echocardiography (2-DE) with Doppler should be performed in all patients at the time of liver transplant evaluation (2-B); if the right ventricular systolic pressure is over 50 mmHg by 2-D echo, a right-heart cardiac catheterization is necessary to establish the diagnosis of portopulmonary hypertension. (2-B)
- Pulmonary function tests, including forced expiratory volume in one second and forced vital capacity should be performed in patients with cystic fibrosis evaluated for liver transplant. (2-B)
- Renal function should be assessed in all patients, with special emphasis on those with metabolic liver diseases associated with renal dysfunction (1-B) and those at increased risk for calcineurin inhibitor toxicity. (2-B)

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- Serum creatinine alone should not be used to assess renal function (1-B); either cystatin C (2-B) or the revised Schwartz Formula (2-C) should be used to estimate the glomerular filtration rate in children with chronic liver disease.
- Children with end stage liver disease should receive a careful oral examination looking for evidence of dental caries, gingival disease, or dental abscess - referral to a pediatric dentist should occur if abnormalities are identified. (2-B)
- Completion of all age-appropriate vaccinations, for the child and family members, should occur prior to transplantation and ideally before the development of end-stage liver disease (1-B); children who have not completed the necessary vaccine schedule can receive vaccinations on an accelerated schedule. (1-B)
- Evidence of a prior Epstein-Barr virus and cytomegalovirus infection, as determined by virus-specific serological measurements, should be performed on all individuals evaluated for liver transplant, recognizing that for children less than 12-18 months of age, antibodies may have been passively transmitted to the child from the mother. (I-A)
- Families should be assessed to ensure social services and psychosocial support systems are adequate for LT-candidates in order to optimize post transplantation outcomes. (1-B)
- Patients and families at potential risk for nonadherence should be identified and receive focused psychosocial interventions prior to and following transplantation. (1-B)
- Neurocognitive testing should be performed in children awaiting LT to identify areas warranting early intervention to minimize later cognitive difficulties (2-B).
- BA patients post-HPE should be promptly referred for LT evaluation if the total bilirubin is greater than 6 mg/dL beyond 3 months from HPE (1-B); liver transplant evaluation should be considered in BA patients whose total bilirubin remains between 2-6 mg/dL (1-B), and for those with lesser bilirubin values who have unmanageable consequences of biliary cirrhosis or portal hypertension. (2-B)
- Careful assessment of cardiac and renal function should occur during LT evaluation in all liver transplant candidates. (2-B)
- Pretransplant vascular imaging of the intra-abdominal vasculature should be performed (2-B); vascular imaging of the head and neck may be considered. (2-C)"

REGULATORY STATUS

Organ transplants, as surgical procedures, do not require U.S. Food and Drug Administration (FDA) approval. The Health Resources Services Administration (HRSA) oversees the transplantation of vascularized human organs through the Organ Procurement and Transplantation Network (OPTN). For more information view the OPTN: <https://www.hrsa.gov/optn> [accessed 2026 February 23].

The HIV Organ Policy Equity (HOPE) Act was signed into law on November 21, 2013, and the provisions of the Act took effect on November 21, 2015. The HOPE act permits donated, HIV-positive kidney and liver organs to be used for transplantation in HIV-positive patients. The HOPE Act directs

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the Department of Health and Human Services and the Organ Procurement Transplant Network (OPTN) to develop and institute standards for research on HIV-positive organ transplantation and permits the Secretary to permit positive-to-positive transplantation if it is determined that the results of research warrant such a change. The Secretary would be required to direct OPTN to develop standards to ensure that positive-to-positive transplantation does not impact the safety of the organ transplantation network. In addition, the Act amends federal criminal law regarding HIV transmission to clarify that such organ donations are not barred. In May of 2020, the HOPE Act was amended to include organs of any type.

CODE(S)

- Codes may not be covered under all circumstances.
- Code list may not be all inclusive (AMA and CMS code updates may occur more frequently than policy updates).
- (E/I)=Experimental/Investigational
- (NMN)=Not medically necessary/appropriate

CPT Codes

Code	Description
44120	Enterectomy, resection of small intestine; single resection and anastomosis
44121	Enterectomy; each additional resection and anastomosis (List separately in addition to code for primary procedure)
44125	Enterectomy, resection of small intestine; with enterostomy
44135	Intestinal allotransplantation from a cadaver donor
44136 (E/I)	Intestinal allotransplantation from a living donor
44137	Removal of transplanted intestinal allograft, complete
47135	Liver allotransplantation; orthotopic, partial or whole from cadaver or living donor, any age

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HCPCS Codes

Code	Description
S2053	Transplantation of small intestine, and liver allografts
S2054	Transplantation of multivisceral organs

ICD10 Codes

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Code	Description
K72.10	Chronic hepatic failure without coma
K72.11	Chronic hepatic failure with coma
K72.90	Hepatic failure, unspecified without coma
K72.91	Hepatic failure, unspecified with coma
K91.2	Postsurgical malabsorption, not elsewhere classified

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SEARCH TERMS

Not Applicable

CENTERS FOR MEDICARE AND MEDICAID SERVICES (CMS)

[NCD - Intestinal and Multi-Visceral Transplantation \(260.5\)](#) [accessed 2026 Feb 09]

PRODUCT DISCLAIMER

- Services are contract dependent; if a product does not cover a service, medical policy criteria do not apply.
- If a commercial product (including an Essential Plan or Child Health Plus product) covers a specific service, medical policy criteria apply to the benefit.
- If a Medicaid product covers a specific service, and there are no New York State Medicaid guidelines (eMedNY) criteria, medical policy criteria apply to the benefit.
- If a Medicare product (including Medicare HMO-Dual Special Needs Program (DSNP) product) covers a specific service, and there is no national or local Medicare coverage decision for the service, medical policy criteria apply to the benefit.
- If a Medicare HMO-Dual Special Needs Program (DSNP) product DOES NOT cover a specific service, please refer to the Medicaid Product coverage line.

POLICY HISTORY/REVISION

Committee Approval Dates

02/16/00, 07/19/01, 06/20/02, 04/24/03, 02/19/04, 02/17/05, 02/16/06, 03/15/07, 03/20/08, 03/19/09, 03/18/10, 03/17/11, 03/15/12, 02/21/13, 02/20/14, 02/19/15, 03/17/16, 03/16/17, 03/15/18, 03/21/19, 10/22/20, 03/18/21, 03/24/22, 03/23/23, 03/21/24, 03/20/25, 03/19/26

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Date	Summary of Changes
03/19/26	<ul style="list-style-type: none">• Annual review; policy intent unchanged.
03/20/25	<ul style="list-style-type: none">• Annual review; policy intent unchanged.
01/01/25	<ul style="list-style-type: none">• Summary of changes tracking implemented.
02/16/00	<ul style="list-style-type: none">• Original effective date