

Corporate Medical Policy

Liver Transplant

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Origination: 12/1995
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Next Review: 9/2010

Description of Procedure or Service

Liver transplantation is now routinely performed as a treatment of last resort for patients with end-stage liver disease. Liver transplantation is performed to replace a diseased liver with a healthy liver graft from a donor. This procedure involves surgically removing the liver tissue from a donor and transplanting it into the patient in a similar procedure. The donor liver common **bile** duct is anastomosed (joined to) the patient's common **bile** duct or to the jejunum (a portion of the small intestine). There are two approaches to transplantation of the liver. With the first method, the patient's liver is removed and replaced with the donor liver (orthotopic transplantation). The alternative method involves the insertion of an extra liver, (heterotopic transplantation). In the heterotopic transplant, the patient's own liver, even though damaged, remains in its normal anatomical position. The major concern with the heterotopic transplantation is that the recipient's diseased liver may harbor bacterial, fungal or viral infection or cancer. Most liver transplantations are orthotopic in nature.

The liver plays a major role in metabolism, digestion, detoxification, and elimination of waste substances from the body. If the liver fails to function properly, toxic substances build up in the body. Some patients with liver failure require transplantation of a donated liver.

Policy

BCBSNC will provide coverage for Liver Transplant when it is determined to be medically necessary because the medical criteria and guidelines shown below are met.

Benefits Application

Please refer to certificate for availability of benefit. Certificates may specifically exclude transplantation procedures from coverage. Certificate language should verify application of medical necessity in making benefit determinations. This policy relates only to the services or supplies described herein. Benefits may vary according to benefit design, therefore certificate language should be reviewed before applying the terms of the policy.

- Coverage for medically necessary liver transplant procedures will be determined based on the member's certificate, the medical criteria and guidelines for coverage, and review on an individual consideration basis.
- The benefit begins at the time of admission for the transplant, or once the patient is determined eligible for the transplant, which may include tests or office visits prior to the actual transplant.
- The benefit ends at the time of discharge from the hospital, or at the end of the required follow-up, including the immunosuppressive drugs administered on an outpatient basis.

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- Expenses incurred in the evaluation and procurement of organs and tissues are benefits when billed by the hospital. Included in these expenses may be specific charges for participation with registries for organ procurement, operating rooms, supplies, use of hospital equipment, and transportation of the tissue or organ to be evaluated.

When Liver transplants are covered

- A. A liver transplant using a cadaver or living donor is considered medically necessary for carefully selected patients with end-stage liver failure due to irreversibly damaged livers from conditions that include, but are not limited to the following:
 1. **Hepatocellular** diseases
 - a. Alcoholic cirrhosis
 - b. Viral induced - hepatitis (all viral types)
 - c. Autoimmune hepatitis
 - d. Alpha-1 Antitrypsin deficiency
 - e. Hemochromatosis
 - f. Protoporphyrria
 - g. Wilson's disease
 2. Cholestatic liver diseases
 - a. Primary biliary cirrhosis
 - b. Primary sclerosing cholangitis with development of secondary biliary cirrhosis
 - c. Biliary **atresia**
 3. **Vascular** diseases
 - a. Budd-Chiari syndrome
 4. Primary **hepatocellular** carcinoma (that has not infiltrated the hepatic vein)
 5. Inborn errors of metabolism
 6. Trauma and toxic reactions
 7. Miscellaneous
 - a. Polycystic disease of the liver
 - b. Familial amyloid polyneuropathy
- B. Additional services may be covered within the scope of the human organ transplant (HOT) benefit:
 1. Hospitalization of the recipient for medically recognized transplants from a donor to the transplant recipient
 2. Pre-hospital work-up and hospitalization of a living related donor undergoing a partial **hepatectomy** (removal of part of the liver) should be considered as part of the recipient transplant costs
 3. Evaluation tests requiring hospitalization to determine the suitability of both potential and actual donors, when such tests cannot be safely and effectively performed on an outpatient basis
 4. Hospital, room, board, and general nursing in semi-private rooms
 5. Special care units, such as coronary and intensive care

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6. Hospital ancillary services
7. Physicians' services for surgery, technical assistance, administration of anesthetics, and medical care
8. Acquisition, preparation, transportation and storage of the organ
9. Diagnostic services
10. Drugs that require a prescription by federal law

When Liver transplants are not covered

1. **Coverage is not generally provided for the following:**
 - a. Human organ transplant (HOT) services, for which the cost is covered/funded by governmental foundation, or charitable grants
 - b. Organs that are sold rather than donated to a recipient
 - c. An artificial organ
2. **Liver transplantation is contraindicated for the following conditions:**
 - a. Patients with an **extrahepatic** malignancy
 - b. Patients with **hepatocellular** carcinoma that has extended beyond the liver
 - c. Patients with ongoing alcohol and/or drug abuse (Evidence for abstinence may vary among liver transplant programs, but generally a minimum of 6 months is required.)
3. **Liver transplantation is considered investigational for the following patients:** (and therefore not covered when the policy excludes investigational services.)
 - a. Patients with disease other than those listed above
 - b. Patients with an active infection except cholangitis
4. Certificates may specifically exclude certain transplant services (e.g., artificial organs). Please refer to certificate for "Transplants Exclusions".

Policy Guidelines

- ◆ **It is recommended that all transplant requests be reviewed by the Plan Medical Director or his or her designee. Only those patients accepted for transplantation by a transplantation center and actively listed for transplant should be considered for precertification or prior approval. Guidelines should be followed for transplant network or consortiums, if applicable.**
- ◆ To be eligible for liver transplantation, it must be likely that the procedure will provide a demonstrable beneficial effect to the patient receiving the liver. Criteria for making this determination include the following:

A. General Criteria for Patient Selection:

1. **Refractory ascites** - unresponsive to medical management, including diuretics, therapeutic paracentesis.
2. **Uncontrolled variceal bleeding -Esophageal:** unresponsive to endoscopic treatment, sclerotherapy or rubberband ligation. **Gastric:** if no esophageal component, requires either surgical decompression (splenectomy if splenic vein thrombosis) or transplantation.

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3. **Encephalopathy** - To be distinguished from organic disease or chronic neuropsychiatric disorder. [Hypokalemia](#) and/or azotemia should be corrected and patient placed on a strict protein restricted diet, lactulose, and/or neomycin.
4. **Wasting** - Not useful as a sole criterion. Occurs early in parenchymal disease, preterminal in cholestatic disease. When extreme, transplantation is no longer feasible due to increased operative-postoperative complications.
5. **Fatigue interfering with normal daily activities** - Usually other criteria for transplant are present. In the absence of other criteria, a detailed psychiatric evaluation should be performed to rule out other factors causing fatigue.
6. **[Hypoxemia](#) secondary to liver disease** - Arterial desaturation due to severe portal hypertension. The hepatopulmonary syndrome is caused by A-V shunting or V-Q mismatch. If corrected by breathing 100% oxygen, then it is due to A-V shunting and transplant will likely correct it.
7. **Hepatorenal syndrome** - Functional renal failure secondary to liver disease should be distinguished from primary renal disease to predict potential for reversibility, and the need for combined liver/kidney transplant.

B. **Risk Factors:**

To be considered medically necessary, a liver transplant must provide a demonstrable beneficial effect on health outcome for the individual. Examples of risk factors which would reduce or remove beneficial outcome include:

1. **Alcohol abuse** - abstinence for at least six months (documented in the progress notes of a formal program) is an absolute requirement.
2. **Nonhepatic neoplastic disease** - patient must be off chemotherapy, determined to be disease free by usual monitoring studies, and have an expected 5-year survival rate of 80% or greater.
3. **Cardiac** - severe valvular disease complicated by severe pulmonary hypertension; alcoholic cardiomyopathy; aortic stenosis with LV dysfunction; coronary artery disease uncorrected or with residual LV dysfunction are all contraindications.
4. **Pulmonary** - severe progressive primary lung disease whose pulmonary functions are irreversibly compromised is a contraindication. Active pulmonary tuberculosis must be treated for at least 3 months prior to transplant. Functional lung disease (e.g., asthma), lung disease secondary to liver disease, and unilateral pneumonectomy are not absolute contraindications to transplant.
5. **Chronic infectious disease** - chronic suppurative infections (e.g., osteomyelitis, sinusitis); HIV; chronic fungal disease.
6. **Rheumatic disease** - Scleroderma with gastrointestinal/pulmonary involvement.
7. **Advanced physiological age.**

C. **Disease Specific Indications:**

Chronic liver failure due to the following:

1. **Cholestatic Liver disease:** Primary Biliary Cirrhosis, Primary Sclerosing Cholangitis, Congenital Biliary Disease, Polycystic Liver disease
2. **Parenchymal Liver Disease:** Autoimmune hepatitis, Chronic Hepatitis C, Cryptogenic Cirrhosis
3. **Metabolic Liver Disease:** Wilson's disease, Alpha-1 Antitrypsin deficiency (rule out concurrent [hepatocellular](#) carcinoma), galactosemia, protoporphyria
4. **Non-hepatic causes of Portal Hypertension:** Trauma, Budd Chiari Syndrome or other [vascular](#) causes (inoperable)
5. **Other systemic disease:** Sarcoidosis, Schistosomiasis

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6. **Chronic Hepatitis B with cirrhosis, provided:** Candidates should be assessed for medical necessity in terms of presence of HBeAg and HBV DNA, indicating active viral replication.
 - a. HBeAg neg, HBV DNA neg, meets medical necessity criteria.
 - b. HBeAg pos, HBV DNA neg or HBeAg neg, HBV DNA pos, investigational, protocol should be reviewed (should be limited to center with active prospective protocol).
 - c. HBeAg pos, HBV DNA pos, considered investigational (should be limited to center with active prospective protocol).
7. **Chronic Alcoholic Liver Disease, provided:** Abstinence should be documented for six months. Enrollment is required in an active support group, such as Alcoholics Anonymous, in addition to strong support by the family or a close friend. Cardiac evaluation should exclude significant cardiomyopathy. A history of bacterial endocarditis with valvular damage significantly worsens prognosis and precludes eligibility.
8. **Neoplastic disease, provided:** **Hepatocellular** carcinoma found in conjunction with cirrhosis, when less than 3 cm in size, with no more than three nodules, and where extensive evaluation yields no evidence of metastasis or systemic symptoms (e.g. weight loss) meets medical necessity requirements for liver transplant. Exploratory laparotomy at the time of the transplant should confirm absence of metastatic disease. Treatment of **hepatocellular** carcinoma with transplant in the absence of the above criteria is considered investigational.
9. **HIV positivity:**
 - a. CD4 count >100cells/mm³;
 - b. HIV-1 RNA undetectable;
 - c. On stable anti-retroviral therapy >3 months;
 - d. No other complications from AIDS (e.g., opportunistic infection, including aspergillus, tuberculosis, coccidioides mycosis, resistant fungal infections, Kaposi's sarcoma, or other neoplasm);
 - e. Meets all other criteria for transplantation.

It is likely that each individual transplant center will have explicit patient selection criteria for HIV positive patients.

D. Other Conditions:

1. **Fulminant hepatic failure:** **Fulminant** hepatic failure is defined by the appearance of severe liver injury with hepatic encephalopathy in a previously healthy person, generally within 2 weeks of onset of liver disease. Subfulminant hepatic failure is appearance within 2-12 weeks of onset of liver disease. In general, candidates meet medical necessity requirements for transplantation for **fulminant** hepatitis resulting from viral, toxic, anesthetic-induced, or medication induced liver injury when they meet **one** of the following sets of criteria:
 - i. Clichy criteria for acute viral hepatitis: 1) Stage III or greater coma; 2) factor V less than 20% (age less than 30 years) or factor V less than 30% (age greater than 30 years).
 - ii. London criteria for non paracetamol-induced acute liver failure: 1) prothrombin time greater than 100 s; or 2) any three of the following prognostic factors are present: age less than 10 years or greater than 40 years; non-A, non-B hepatitis; Halothane hepatitis or idiosyncratic drug reaction; duration of **jaundice** before onset of encephalopathy greater than 7 days; prothrombin time greater than 50 s; serum bilirubin greater than 300 μ mol/l.
2. Patients with **polycystic disease of the liver** do not develop liver failure but may require transplantation due to the anatomic complications of a massively enlarged liver. **One** of the following complications should be present, which are not amenable to non transplant surgery:
 - i. Enlargement of liver impinging on respiratory function

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- ii. Extremely painful enlargement of liver
 - iii. Enlargement of liver significantly compressing and interfering with function of other abdominal organs
3. Patients with **familial amyloid polyneuropathy** do not experience liver disease, per se, but develop polyneuropathy and cardiac amyloidosis due to the production of a variant transthyretin molecule by the liver. Candidacy for liver transplant is an individual consideration based on the morbidity of the polyneuropathy. Many patients may not be candidates for liver transplant alone due to coexisting cardiac disease.
4. Patients with **hepatocellular carcinoma** are appropriate candidates for liver transplant only if the disease remains confined to the liver. Therefore, the patient should be periodically monitored while on the waiting list, and if metastatic disease develops, the patient should be removed from the transplant waiting list. In addition, at the time of transplant a backup candidate should be scheduled. If locally extensive or metastatic cancer is discovered at the time of exploration prior to **hepatectomy**, the transplant should be aborted, and the backup candidate scheduled for transplant.

Billing/Coding/Physician Documentation Information

This policy may apply to the following codes. Inclusion of a code in this section does not guarantee that it will be reimbursed. For further information on reimbursement guidelines, please see Administrative Policies on the Blue Cross Blue Shield of North Carolina web site at www.bcbsnc.com. They are listed in the Category Search on the Medical Policy search page.

Applicable Codes: 47133, 47135, 47136, 47140, 47141, 47142, 47143, 47144, 47145, 47146, 47147, S2152

While charges for the retrieval of organs are considered eligible for coverage when patient criteria are met, any charges for the organ itself are considered ineligible for coverage.

BCBSNC may request medical records for determination of medical necessity. When medical records are requested, letters of support and/or explanation are often useful, but are not sufficient documentation unless all specific information needed to make a medical necessity determination is included.

Medical Term Definitions

Ascites

Excessive accumulation of fluid in the abdominal cavity.

Atresia

the congenital absence or closure of a natural passage or channel of the body.

Bile

a greenish yellow fluid that is produced by the liver and stored in the gall bladder and poured into the intestine by way of the bile ducts. It plays an important role in the intestinal absorption of fats in the body.

Esophagus

the natural tube that connects the mouth to the stomach.

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Extrahepatic

situation or occurring outside the liver.

Fulminant

sudden, severe; occurring suddenly and with great intensity.

Hepatectomy

surgical removal of all or part of the liver.

Hepatocellular

pertaining to or affecting liver cells.

Hypokalemia

abnormally low potassium concentration in the blood.

Hypoxemia

deficiency of oxygen in the blood.

Jaundice

yellowing of the skin and the whites of the eyes from a bile pigment called bilirubin. It is frequently due to a liver problem.

Variceal

Enlarged and twisted veins, arteries or lymphatic vessels.

Vascular

pertains to blood vessels in the body.

Scientific Background and Reference Sources

Guide to Liver Transplantation, Fabry, T, and Klion, F, Igaku-Shoin, pub.; 1992

Liver transplantation in European patients with Hepatitis B surface antigen. N Engl J Med, 1993; 329:1842-7

Emergency liver transplantation for acute liver failure. Evaluation of London and Clichy criteria J-Hepatol. 1993 Jan; 17(1):124-7

(Criteria for and results of liver transplantation in patients with acute liver insufficiency), Ned Tijdschr Geneesk 1994 Sep 17; 138(38):1901-4, clinical abstract

Fulminant hepatic failure: summary of a workshop, Hepatology 1995 Jan;21(1):240-52

Medline search, liver transplant, hepatitis, 1/1994-10/95

Consultant Review 11/95

Physician Advisory Group - 1/96

BCBSA Medical Policy Reference Manual - 1/30/98

Independent Consultant Review - 2/99

Medical Policy Advisory Group - 12/99

Specialty Matched Consultant Advisory Panel - 10/2000

Medical Policy Advisory Group - 10/2000

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BCBSA Medical Policy Reference Manual, 12/15/00; 7.03.06

BCBSA Medical Policy Reference Manual, 5/15/02; 7.03.06

Specialty Matched Consultant Advisory Panel - 8/2002

BCBSA Medical Policy Reference Manual, 10/9/03; 7.03.06

BCBSA Medical Policy Reference Manual [Electronic Version]. 7.03.06, 2/25/04.

Specialty Matched Consultant Advisory Panel - 8/2004

Roland ME. Solid-organ transplantation in HIV-infected patients in the potent antiretroviral therapy era. *Top HIV Med* 2004; 12(3):73-6.

ClinicalTrials.gov, National Institutes of Allergy and Infectious Diseases (NIAID). Kidney and liver transplantation in people with HIV. Updated 2006 July 24. Accessed August 9, 2006. Available at URL address: <http://www.clinicaltrials.gov/ct/show/NCT00074386?order=1>

BCBSA Medical Policy Reference Manual [Electronic Version]. 7.03.06, 4/1/05.

BCBSA Medical Policy Reference Manual [Electronic Version]. 7.03.06, 4/25/06.

Specialty Matched Consultant Advisory Panel - 8/30/2006

BCBSA Medical Policy Reference Manual [Electronic Version]. 7.03.06, 6/14/07.

Specialty Matched Consultant Advisory Panel - 9/4/08

Policy Implementation/Update Information

- 12/95 Local policy issued.
- 12/96 Reaffirmed.
- 11/98 Added statements from the National Association policy and Consultant reviews.
- 2/99 Independent Consultant Review
- 6/99 Reformatted, Description of Procedure or Service changed, Medical Term Definitions added.
- 12/99 Medical Policy Advisory Group
- 10/00 Specialty Matched Consultant Advisory Panel review. No change recommended in criteria. System coding changes. Medical Policy Advisory Group review. No change in criteria. Approve.
- 2/01 Revised. Added statements under the covered section. Added cadaver or living donor. Typo corrected.
- 2/03 Specialty Matched Consultant Advisory Panel review. No change to policy.
- 5/03 Description of Procedure or Service section expanded to provide more detail. General Criteria reformatted.
- 4/04 Benefits Application and Billing/Coding sections updated for consistency. Code S2152 added to Billing/Coding section.
- 9/9/04 Specialty Matched Consultant Advisory Panel review. No change to policy. Added new 2004 CPT codes 47140, 47141, 47142 to Billing/Coding section and removed code 47134 (code deleted, to report use 47140).
- 1/6/05 Codes 47143, 47144, 47145, 47146, 47147 added to the Billing/Coding section of policy.
- 10/2/06 Under "When Covered", A.1.b. "Viral hepatitis (all blood types)", now reads "Viral induced-hepatitis (all viral types)". Under "When Not Covered" 2. Contraindications, removed a. HIV- positive

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patient. Under "Policy Guidelines" C. Disease Specific Indications, 6.b. added "or HBeAg neg, HBV DNA pos,"; added 9. "HIV positivity: CD4 count >100cells/mm³; HIV-1 RNA undetectable; On stable anti-retroviral therapy >3 months; No other complications from AIDS (e.g., opportunistic infection, including aspergillus, tuberculosis, coccidioides mycosis, resistant fungal infections, Kaposi's sarcoma, or other neoplasm); Meets all other criteria for transplantation. It is likely that each individual transplant center will have explicit patient selection criteria for HIV positive patients." Reference sources added. (pmo)

5/11/09 Under "When Not Covered", removed 3.a. *Patients over age 70*; added #4. "Certificate may exclude certain transplant services (e.g., artificial organs). Please refer to certificates for "Transplants Exclusions".

Under "Policy Guidelines", B. Risk Factors, #2 now reads: "Nonhepatic neoplastic disease - patient must be off chemotherapy, determined to be disease free by usual monitoring studies, and have an expected 5-year survival rate of 80% or greater."; also added #7. "Advanced physiological age."

Reference sources added. (pmo)

6/22/10 Policy Number(s) removed (amw)

Medical policy is not an authorization, certification, explanation of benefits or a contract. Benefits and eligibility are determined before medical guidelines and payment guidelines are applied. Benefits are determined by the group contract and subscriber certificate that is in effect at the time services are rendered. This document is solely provided for informational purposes only and is based on research of current medical literature and review of common medical practices in the treatment and diagnosis of disease. Medical practices and knowledge are constantly changing and BCBSNC reserves the right to review and revise its medical policies periodically.