# MEDICAL POLICY

| POLICY TITLE | LIVER TRANSPLANT AND COMBINED LIVER-KIDNEY TRANSPLANT |
|---|---|
| POLICY NUMBER | MP-9.006 |

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|---|---|
| **Original Issue Date (Created):** | **9/20/2002** |
| **Most Recent Review Date (Revised):** | **2/11/2020** |
| **Effective Date:** | **10/1/2020** |



## I. POLICY

A liver transplant, using a cadaver or living donor, is **medically necessary** for carefully selected patients with end-stage liver failure due to irreversibly damaged livers.

Etiologies of end-stage liver disease include, but are not limited to, the following:

- Hepatocellular diseases
  - Alcoholic cirrhosis
  - Viral hepatitis (either A, B, C, or non-A, non-B)
  - Autoimmune hepatitis
  - Alpha-1 antitrypsin deficiency
  - Hemochromatosis
  - Non-alcoholic steatohepatitis
  - Protoporphyria
  - Wilson disease
- Cholestatic liver diseases
  - Primary biliary cirrhosis
  - Primary sclerosing cholangitis with development of secondary biliary cirrhosis
  - Biliary atresia
- Vascular disease
  - Budd-Chiari syndrome
- Primary hepatocellular carcinoma (see Policy Guidelines section for patient selection criteria)
- Inborn errors of metabolism
- Trauma and toxic reactions
- Miscellaneous
  - Familial amyloid polyneuropathy

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Liver transplantation may be considered **medically necessary** in patients with polycystic disease of the liver who have massive hepatomegaly causing obstruction or functional impairment.

Liver transplantation may be considered **medically necessary** in patients with unresectable hilar cholangiocarcinoma (see Policy Guidelines for patient selection criteria).

Liver transplantation may be considered **medically necessary** in pediatric patients with nonmetastatic hepatoblastoma.

Liver *retransplantation* may be considered **medically necessary** in patients with:

- primary graft nonfunction
- hepatic artery thrombosis
- chronic rejection
- ischemic type biliary lesions after donation after cardiac death
- recurrent non-neoplastic disease causing late graft failure

Combined liver-kidney transplantation may be considered **medically necessary** in patients who qualify for liver transplantation and have advanced irreversible kidney disease.

Liver transplantation is considered **investigational** in the following patients as there is insufficient evidence to support a conclusion concerning the health outcomes or benefits associated with this procedure:

- Patients with an intrahepatic cholangiocarcinoma
- Patients with neuroendocrine tumors metastatic to the liver

Liver transplantation is considered **not medically necessary** in the following patients:

- Patients with hepatocellular carcinoma that has extended beyond the liver (see Policy Guidelines section for patient selection criteria)
- Patients with ongoing alcohol and/or drug abuse. (Evidence for abstinence may vary among liver transplant programs, but generally a minimum of 3 months is required.)

Liver transplantation is considered **investigational** in all other situations not described above as there is insufficient evidence to support a conclusion concerning the health outcomes or benefits associated with this procedure.

## POLICY GUIDELINES

**Contraindications**
Potential contraindications subject to the judgment of the transplant center:

1. Known current malignancy, including metastatic cancer
2. Recent malignancy with high risk of recurrence
3. Untreated systemic infection making immunosuppression unsafe, including chronic infection
4. Other irreversible end-stage disease not attributed to liver disease
5. History of cancer with a moderate risk of recurrence
6. Systemic disease that could be exacerbated by immunosuppression
7. Psychosocial conditions or chemical dependency affecting ability to adhere to therapy

**LIVER SPECIFIC PATIENT SELECTION CRITERIA**

The Model for End-stage Liver Disease (MELD) and Pediatric End-stage Liver Disease (PELD) scores range from 6 (less ill) to 40 (gravely ill). The MELD and PELD scores will change during the course of a patient's tenure on the waiting list.

Patients with liver disease related to alcohol or drug abuse must be actively involved in a substance abuse treatment program.

Tobacco consumption is a contraindication.

Patients with polycystic disease of the liver do not develop liver failure but may require transplantation due to the anatomic complications of a hugely enlarged liver. The MELD and PELD score may not apply to these cases. One of the following complications should be present:

- Enlargement of liver impinging on respiratory function
- Extremely painful enlargement of liver
- Enlargement of liver significantly compressing and interfering with function of other abdominal organs

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. MELD and PELD exception criteria and scores may apply to these cases. 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.

**Hepatocellular Carcinoma**

Criteria used for patient selection of hepatocellular carcinoma patients eligible for liver transplant include the Milan criteria, which is considered the criterion standard, the University of California, San Francisco (UCSF) expanded criteria, and United Network of Organ Sharing (UNOS) criteria.

***Milan criteria***: a single tumor 5 cm or less in diameter or 2 to 3 tumors 3 cm or less.

***University of California, San Francisco expanded criteria***: a single tumor 6.5 cm or less or up to 3 tumors 4.5 cm or less, and a total tumor size of 8 cm or less.

***UNOS T2 criteria***: a single tumor 1 cm or greater and up to 5 cm or less in diameter or 2 to 3 tumors 1 cm or greater and up to 3 cm or less and without extrahepatic spread or macrovascular invasion. UNOS criteria, which were updated in 2017, may prioritize T2 hepatocellular carcinoma (HCC) that meet specified staging and imaging criteria by allocating additional points equivalent to a MELD score predicting a 15% probability of death within 3 months (http://optn.transplant.hrsa.gov/PoliciesandBylaws2/policies/pdfs/policy_8.pdf).

Patients with HCC 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.

Note that liver transplantation for those with T3 HCC is not prohibited by UNOS guidelines, but these patients do not receive any priority on the waiting list. All patients with HCC awaiting transplantation are reassessed at 3-month intervals. Those whose tumors have progressed and are no longer T2 tumors will lose the additional allocation points.

Additionally, nodules identified through imaging of cirrhotic livers are given a Class 5 designation. Class 5B and 5T nodules are eligible for automatic priority. Class 5B criteria consist of a single nodule 2 cm or larger and up to 5 cm (T2 stage) that meets specified imaging criteria. Class 5T nodules have undergone subsequent locoregional treatment after being automatically approved on initial application or extension. A single Class 5A nodule (greater than 1 cm and less than 2 cm) corresponds to T1 HCC and does not qualify for automatic priority. However, combinations of Class 5A nodules are eligible for automatic priority if they meet stage T2 criteria. Class 5X lesions are outside of stage T2 and are not eligible for automatic exception points. Nodules less than 1 cm are considered indeterminate and are not considered for additional priority. Therefore, the UNOS allocation system provides strong incentives to use locoregional therapies to downsize tumors to T2 status and to prevent progression while on the waiting list.

**Cholangiocarcinoma**
According to the Organ Procurement and Transplantation Network (OPTN) policy on liver allocation, candidates with cholangiocarcinoma (CCA) meeting the following criteria will be eligible for a MELD or PELD exception with a 10% mortality equivalent increase every 3 months:

- Centers must submit a written protocol for patient care to the OPTN and UNOS Liver and Intestinal Organ Transplantation Committee before requesting a MELD score exception for a candidate with cholangiocarcinoma. This protocol should include selection criteria, administration of neoadjuvant therapy before transplantation, and

operative staging to exclude patients with regional hepatic lymph node metastases, intrahepatic metastases, and/or extrahepatic disease. The protocol should include data collection as deemed necessary by the OPTN/UNOS Liver and Intestinal Organ Transplantation Committee.

- Candidates must satisfy diagnostic criteria for hilar CCA: malignant-appearing stricture on cholangiography and one of the following: carbohydrate antigen 19-9 100 U/mL, or and biopsy or cytology results demonstrating malignancy, or aneuploidy. The tumor should be considered unresectable on the basis of technical considerations or underlying liver disease (e.g., primary sclerosing cholangitis).
- If cross-sectional imaging studies (computed tomography [CT] scan, ultrasound, magnetic resonance imaging [MRI]) demonstrate a mass, the mass should be 3 cm or less.
- Intra- and extrahepatic metastases should be excluded by cross-sectional imaging studies of the chest and abdomen at the time of initial exception and every 3 months before score increases.
- Regional hepatic lymph node involvement and peritoneal metastases should be assessed by operative staging after completion of neoadjuvant therapy and before liver transplantation. Endoscopic ultrasound-guided aspiration of regional hepatic lymph nodes may be advisable to exclude patients with obvious metastases before neoadjuvant therapy is initiated.
- Transperitoneal aspiration or biopsy of the primary tumor (either by endoscopic ultrasound, operative, or percutaneous approaches) should be avoided because of the high risk of tumor seeding associated with these procedures.

**DONOR CRITERIA: LIVING DONOR LIVER TRANSPLANT**

Donor morbidity and mortality are prime concerns in donors undergoing right lobe, left lobe, or left lateral segment donor partial hepatectomy as part of living donor liver transplantation. Partial hepatectomy is a technically demanding surgery, the success of which may be related to the availability of an experienced surgical team. In 2000, the American Society of Transplant Surgeons proposed the following guidelines for living donors:

- Should be healthy individuals who are carefully evaluated and approved by a multidisciplinary team including hepatologists and surgeons to assure that they can tolerate the procedure
- Should undergo evaluation to assure that they fully understand the procedure and associated risks
- Should be of legal age and have sufficient intellectual ability to understand the procedures and give informed consent
- Should be emotionally related to the recipients
- Must be excluded if the donor is felt or known to be coerced
- Need to have the ability and willingness to comply with long-term follow-up

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***Cross-reference:***
**MP 9.013** Isolated Small Bowel Transplant and Small Bowel-Liver and Multivisceral Transplant

## II. PRODUCT VARIATIONS

TOP

This policy is only applicable to certain programs and products administered by Capital BlueCross please see additional information below, and subject to benefit variations as discussed in Section VI below.

**FEP PPO** - Refer to FEP Medical Policy Manual MP-7.03.06, Liver Transplant. The FEP Medical Policy Manual can be found at: https://www.fepblue.org/benefit-plans/medical-policies-and-utilization-management-guidelines/medical-policies.

## III. DESCRIPTION/BACKGROUND

TOP

Liver transplantation is currently performed routinely as a treatment of last resort for patients with end-stage liver disease. Liver transplantation may be performed with a liver donation after brain or cardiac death or with a liver segment donation from a living donor. Patients are prioritized for transplant by mortality risk and severity of illness criteria developed by the Organ Procurement and Transplantation Network and the United Network of Organ Sharing. The severity of illness is determined by the Model for End-stage Liver Disease (MELD) and Pediatric End-stage Liver Disease (PELD) scores.

### LIVER TRANSPLANTATION

**Recipients**
Liver transplantation is now routinely performed as a treatment of last resort for patients with end-stage liver disease. Liver transplantation may be performed with liver donation after brain or cardiac death or with a liver segment donation from a living donor. Patients are prioritized for transplant by mortality risk and severity of illness criteria developed by Organ Procurement and Transplantation Network and United Network of Organ Sharing. The original liver allocation system was based on assignment to status 1, 2A, 2B, or 3. Status 2A, 2B, and 3 were based on the Child-Turcotte-Pugh score, which included a subjective assessment of symptoms as part of the scoring system. In 2002, status 2A, 2B, and 3 were replaced with 2 disease severity scales: Model for End-stage Liver Disease (MELD) and Pediatric End-stage Liver Disease (PELD) for patients younger than age 12 years. In 2013, the Organ Procurement and Transplantation Network and United Network of Organ Sharing published its most recent allocation system, which previously expanded status 1 to status 1A and 1B in September 2012. Status 1A patients have acute liver failure with a life expectancy of less than 7 days without a liver transplant. Status 1A patients also include primary graft nonfunction, hepatic artery thrombosis, and acute Wilson disease. Status 1A patients must be recertified every 7 days. Status 1B patients are

pediatric patients (age range, 0-17 years) with chronic liver disease, which may include the following: fulminant liver failure, primary nonfunction, hepatic artery thrombosis, acute decompensated Wilson disease, chronic liver disease; and nonmetastatic hepatoblastoma. Pediatric patients move to status 1A at age 18 but still qualify for pediatric indications.

Following status 1, donor livers will be prioritized to those with the highest scores on MELD or PELD. With this allocation system, the highest priority for liver transplantation is given to patients receiving the highest number of points. The scoring system for MELD and PELD is a continuous disease severity scale based entirely on objective laboratory values. These scales have been found to be highly predictive of the risk of dying from liver disease for patients waiting on the transplant list. The MELD score incorporates bilirubin, prothrombin time (i.e., international normalized ratio), and creatinine into an equation, producing a number that ranges from 6 to 40. The PELD score incorporates albumin, bilirubin, INR growth failure, and age at listing. Waiting time will only be used to break ties among patients with the same MELD or PELD score and blood type compatibility. In the previous system, waiting time was often a key determinant of liver allocation, and yet, waiting time was found to be a poor predictor of the urgency of liver transplant because some patients were listed early in the course of their disease, while others were listed only when they became sicker. In the revised allocation systems, patients with a higher mortality risk and higher MELD and PELD scores will always be considered before those with lower scores, even if some patients with lower scores have waited longer.[1] Status 7 describes patients who are temporarily inactive on the transplant waiting list due to being temporarily unsuitable for transplantation. Pediatric patients who turn 18 are status X.

## Management

Management of acute rejection of liver transplant using intravenous immunoglobulin or plasmapheresis is discussed separately in evidence reviews 8.01.05 and 8.02.02, respectively. Also, the role of chemoembolization or radiofrequency ablation as a bridge to transplant in patients with hepatocellular cancer is addressed separately.

**Donors**

Due to the scarcity of donor livers, a variety of strategies have been developed to expand the donor pool. For example, split graft refers to dividing a donor liver into 2 segments that can be used for 2 recipients. Living donor liver transplantation (LDLT) is now commonly performed for adults and children from a related or unrelated donor. Depending on the graft size needed for the recipient, either the right lobe, left lobe or the left lateral segment can be used for LDLT. In addition to addressing the problem of donor organ scarcity, LDLT allows the procedure to be scheduled electively before the recipient's condition deteriorates or serious complications develop. LDLT also shortens the preservation time for the donor liver and decreases disease transmission from donor to recipient.

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**REGULATORY STATUS**

The U.S. Food and Drug Administration regulates human cells and tissues intended for implantation, transplantation, or infusion through the Center for Biologics Evaluation and Research, under Code of Federal Regulation title 21, parts 1270 and 1271. Liver transplants are included in these regulations.

## IV. RATIONALE

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**SUMMARY OF EVIDENCE**

For individuals who have hepatocellular disease who receive a liver transplant, the evidence includes case series, registry studies, and systematic reviews. Relevant outcomes include overall survival, morbid events, and treatment-related morbidity and mortality. Studies on liver transplantation for viral hepatitis have found that survival is lower than for other liver diseases. Although these statistics raise questions about the most appropriate use of a scarce resource (donor livers), the long-term survival rates are significant in a group of patients who have no other treatment options. Also, survival can be improved by the eradication of the hepatitis virus before transplantation. For patients with NASH, overall survival rates have been shown to be similar to other indications for liver transplantation. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have primary HCC who receive a liver transplant, the evidence includes systematic reviews of observational studies. Relevant outcomes include overall survival, morbid events, and treatment-related morbidity and mortality. In the past, long-term outcomes in patients with primary hepatocellular malignancies had been poor (19%) compared with the overall survival of liver transplant recipients. However, the recent use of standardized patient selection criteria (eg, the Milan criteria diameter) has dramatically improved overall survival rates. In appropriately selected patients, a liver transplant has been shown to result in higher survival rates than resection. In patients who present with unresectable organ-confined disease, transplant represents the only curative approach. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have extrahepatic cholangiocarcinoma who receive a liver transplant, the evidence includes systematic reviews of observational studies. Relevant outcomes include overall survival, morbid events, and treatment-related morbidity and mortality. For patients with extrahepatic (hilar or perihilar) cholangiocarcinoma who are treated with adjuvant chemotherapy, survival rates have been reported as high as 76%. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have intrahepatic cholangiocarcinoma who receive a liver transplant, the evidence includes registry studies. Relevant outcomes include overall survival, morbid events, and treatment-related morbidity and mortality. Five-year survival rates after liver transplantation

in patients with cholangiocarcinoma are less than 30%. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have NETs who receive a liver transplant, the evidence includes systematic reviews of case series. Relevant outcomes include overall survival, morbid events, and treatment-related morbidity and mortality. In select patients with nonresectable, hormonally active liver metastases refractory to medical therapy, liver transplantation has been considered as an option to extend survival and minimize endocrine symptoms. While some centers may perform liver transplants on select patients with neuroendocrine tumors, the available studies are limited by their heterogeneous populations. Further studies are needed to determine the appropriate selection criteria. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have pediatric hepatoblastoma who receive a liver transplant, the evidence includes case series. Relevant outcomes include overall survival, morbid events, and treatment-related morbidity and mortality. The literature on liver transplantation for pediatric hepatoblastoma is limited, but case series have demonstrated good outcomes and high rates of long-term survival. Additionally, nonmetastatic pediatric hepatoblastoma is among in United Network for Organ Sharing criteria for patients eligible for liver transplantation. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have a failed liver transplant who receive a liver retransplant, the evidence includes observational studies. Relevant outcomes include overall survival, morbid events, and treatment-related morbidity and mortality. Case series have demonstrated favorable outcomes with liver retransplantation in certain populations, such as when criteria for an original liver transplantation are met for retransplantation. While some evidence has suggested outcomes after retransplantation may be less favorable than for initial transplantation in some patients, long-term survival benefits have been demonstrated. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals with indications for liver and kidney transplant who receive a CLKT, the evidence includes registry studies. Relevant outcomes include overall survival, morbid events, and treatment-related morbidity and mortality. Most of the evidence involves adults with cirrhosis and kidney failure. Indications for CLKT in children are rare and often congenital and include liver-based metabolic abnormalities affecting the kidney, along with structural diseases affecting both the liver and kidney. In both adults and children, comparisons with either liver or kidney transplantation alone would suggest that CLKT is no worse, and possibly better, for graft and patient survival. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

## V. DEFINITIONS

TOP

**ALBUMIN** refers to one of a group of simple proteins widely distributed in plant and animal tissues. It is found in the blood as serum albumin, in milk as lactalbumin, and in egg white as ovalbumin.

**BILIRUBIN** refers to the orange-colored or yellowish pigment in the bile. It is derived from hemoglobin of red blood cells that have completed their life span and are destroyed and ingested by the macrophage system of the liver, spleen, and red bone marrow.

**BLUE QUALITY CENTERS FOR TRANSPLANT (BQCT)** is a cooperative effort of the Blue Cross and Blue Shield Plans, the Blue Cross and Blue Shield Association and participating medical institutions to provide patients who need transplants with access to leading centers through a coordinated, streamlined program of transplant management.

**CADAVER** refers to a dead body or corpse.

**END-STAGE** refers to the final phase of a disease process.

**EXTRAHEPATIC** refers to outside or unrelated to the liver.

**HEPATOCELLULAR** refers to the cells of the liver.

**MACROVASCULAR** refers to the larger blood vessels in the body.

**PROTHROMBIN TIME** is the time it takes for clotting to occur after prothromboplastin and calcium are added to decalcified plasma.

**UNITED NETWORK OF ORGAN SHARING (UNOS)** is an organization established in 1984 to facilitate donation of organs for possible transplantation.

## VI. BENEFIT VARIATIONS

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The existence of this medical policy does not mean that this service is a covered benefit under the member's health benefit plan. Benefit determinations should be based in all cases on the applicable health benefit plan language. Medical policies do not constitute a description of benefits. A member's health benefit plan governs which services are covered, which are excluded, which are subject to benefit limits and which require preauthorization. There are different benefit plan designs in each product administered by Capital BlueCross. Members and

providers should consult the member's health benefit plan for information or contact Capital BlueCross for benefit information.

## VII. DISCLAIMER

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*Capital BlueCross's medical policies are developed to assist in administering a member's benefits, do not constitute medical advice and are subject to change. Treating providers are solely responsible for medical advice and treatment of members. Members should discuss any medical policy related to their coverage or condition with their provider and consult their benefit information to determine if the service is covered. If there is a discrepancy between this medical policy and a member's benefit information, the benefit information will govern. If a provider or a member has a question concerning the application of this medical policy to a specific member's plan of benefits, please contact Capital BlueCross' Provider Services or Member Services. Capital BlueCross considers the information contained in this medical policy to be proprietary and it may only be disseminated as permitted by law.*

## VIII. CODING INFORMATION

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**Note:** This list of codes may not be all-inclusive, and codes are subject to change at any time. The identification of a code in this section does not denote coverage as coverage is determined by the terms of member benefit information. In addition, not all covered services are eligible for separate reimbursement.

**Covered when medically necessary:**

| CPT Codes® | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 47133 | 47135 | 47140 | 47141 | 47142 | 47143 | 47144 | 47145 | 47146 |
| 47147 | 47399 | | | | | | | |



**Covered when medically necessary:**

| HCPCS Code | Description |
|---|---|
| S2152 | Solid organ(s), complete or segmental, single organ or combination of organs; deceased or living donor (s), procurement, transplantation, and related complications; including: drugs; supplies; hospitalization with outpatient follow-up; medical/surgical, diagnostic, emergency, and rehabilitative services, and the number of days of pre and posttransplant care in the global definition |

| ICD-10-CM Diagnosis Code | Description |
|---|---|
| B15.0 | Hepatitis A with hepatic coma |

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| ICD-10-CM Diagnosis Code | Description |
|---|---|
| B15.9 | Hepatitis A without hepatic coma |
| B16.0 | Acute hepatitis B with delta-agent with hepatic coma |
| B16.1 | Acute hepatitis B with delta-agent without hepatic coma |
| B16.2 | Acute hepatitis B without delta-agent with hepatic coma |
| B16.9 | Acute hepatitis B without delta-agent and without hepatic coma |
| B17.0 | Acute delta-(super) infection of hepatitis B carrier |
| B17.10 | Acute hepatitis C without hepatic coma |
| B17.11 | Acute hepatitis C with hepatic coma |
| B17.8 | Other specified acute viral hepatitis |
| B17.9 | Acute viral hepatitis, unspecified |
| B18.0 | Chronic viral hepatitis B with delta-agent |
| B18.1 | Chronic viral hepatitis B without delta-agent |
| B18.2 | Chronic viral hepatitis C |
| B18.8 | Other chronic viral hepatitis |
| B18.9 | Chronic viral hepatitis, unspecified |
| B19.0 | Unspecified viral hepatitis with hepatic coma |
| B19.10 | Unspecified viral hepatitis B without hepatic coma |
| B19.11 | Unspecified viral hepatitis B with hepatic coma |
| B19.20 | Unspecified viral hepatitis C without hepatic coma |
| B19.21 | Unspecified viral hepatitis C with hepatic coma |
| B25.1 | Cytomegaloviral hepatitis |
| B66.1 | Clonorchiasis |
| B66.5 | Fasciolopsiasis |
| C22.0 | Liver cell carcinoma |
| B15.0 | Hepatitis A with hepatic coma |
| B15.9 | Hepatitis A without hepatic coma |
| B16.0 | Acute hepatitis B with delta-agent with hepatic coma |
| B16.1 | Acute hepatitis B with delta-agent without hepatic coma |
| B16.2 | Acute hepatitis B without delta-agent with hepatic coma |
| B16.9 | Acute hepatitis B without delta-agent and without hepatic coma |
| B17.0 | Acute delta-(super) infection of hepatitis B carrier |
| B17.10 | Acute hepatitis C without hepatic coma |
| B17.11 | Acute hepatitis C with hepatic coma |
| B17.2 | Acute hepatitis E |
| B17.8 | Other specified acute viral hepatitis |
| B18.0 | Chronic viral hepatitis B with delta-agent |
| B18.1 | Chronic viral hepatitis B without delta-agent |
| B18.2 | Chronic viral hepatitis C |

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| ICD-10-CM Diagnosis Code | Description |
|---|---|
| B18.8 | Other chronic viral hepatitis |
| B19.10 | Unspecified viral hepatitis B without hepatic coma |
| B19.11 | Unspecified viral hepatitis B with hepatic coma |
| B19.20 | Unspecified viral hepatitis C without hepatic coma |
| B19.21 | Unspecified viral hepatitis C with hepatic coma |
| B19.9 | Unspecified viral hepatitis without hepatic coma |
| B25.1 | Cytomegaloviral hepatitis |
| B66.1 | Clonorchiasis |
| B66.5 | Fasciolopsiasis |
| C22.0 | Liver cell carcinoma |
| C22.1 | Intrahepatic bile duct carcinoma |
| C22.2 | Hepatoblastoma |
| C22.3 | Angiosarcoma of liver |
| C22.4 | Other sarcomas of liver |
| D13.4 | Benign neoplasm of liver |
| D13.5 | Benign neoplasm of extrahepatic bile ducts |
| D64.1 | Secondary sideroblastic anemia due to disease |
| D64.2 | Secondary sideroblastic anemia due to drugs and toxins |
| D64.3 | Other sideroblastic anemias |
| D64.4 | Congenital dyserythropoietic anemia |
| D81.810 | Biotinidase deficiency |
| D84.1 | Defects in the complement system |
| E70.0 | Classical Phenylketonuria |
| E70.1 | Other hyperphenylalaninemias |
| E70.5 | Disorders of Tryptophan metabolism |
| E70.81 | aromatic l-amino acid decarboxylase deficiency |
| E70.89 | Other disorders of aromatic amino- acid metabolism |
| E71.42 | Carnitine deficiency due to inborn errors of metabolism |
| E72.00 | Disorders of amino-acid transport, unspecified |
| E72.01 | Cystinuria |
| E72.02 | Hartnup's disease |
| E72.03 | Lowe's syndrome |
| E72.04 | Cystinosis |
| E72.09 | Other disorders of amino-acid transport |
| E74.00 | Glycogen storage disease, unspecified |
| E74.01 | von Gierke disease |
| E74.02 | Pompe disease |
| E74.03 | Cori disease |

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| ICD-10-CM Diagnosis Code | Description |
|---|---|
| E74.04 | McArdle disease |
| E74.09 | Other glycogen storage disease |
| E74.10 | Disorder of fructose metabolism, unspecified |
| E74.11 | Essential fructosuria |
| E74.12 | Hereditary fructose intolerance |
| E74.19 | Other disorders of fructose metabolism |
| E74.20 | Disorders of galactose metabolism, unspecified |
| E74.21 | Galactosemia |
| E74.29 | Other disorders of galactose metabolism |
| E74.31 | Sucrase-isomaltase deficiency |
| E74.39 | Other disorders of intestinal carbohydrate absorption |
| E74.4 | Disorders of pyruvate metabolism and gluconeogenesis |
| E70.81 | Aromatic l-amino acid decarboxylase deficiency |
| E70.89 | Other disorders of aromatic amino-acid metabolism |
| E74.81 | Disorders of glucose transport, not elsewhere classified |
| E74.810 | Glucose transporter protein type 1 deficiency |
| E74.818 | Other disorders of glucose transport |
| E74.819 | Disorders of glucose transport, unspecified |
| E74.89 | Other specified disorders of carbohydrate metabolism |
| E74.9 | Disorder of carbohydrate metabolism, unspecified |
| E78.0 | Pure hypercholesterolemia |
| E78.1 | Pure hyperglyceridemia |
| E78.2 | Mixed hyperlipidemia |
| E78.3 | Hyperchylomicronemia |
| E78.41 | Elevated Lipoprotein(a) |
| E78.49 | Other hyperlipidemia |
| E78.5 | Hyperlipidemia, unspecified |
| E78.6 | Lipoprotein deficiency |
| E78.70 | Disorder of bile acid and cholesterol metabolism, unspecified |
| E78.71 | Barth syndrome |
| E78.72 | Smith-Lemli-Opitz syndrome |
| E78.79 | Other disorders of bile acid and cholesterol metabolism |
| E78.81 | Lipoid dermatoarthritis |
| E78.89 | Other lipoprotein metabolism disorders |
| E78.9 | Disorder of lipoprotein metabolism, unspecified |
| E80.0 | Hereditary erythropoietic porphyria |
| E80.1 | Porphyria cutanea tarda |
| E80.20 | Unspecified porphyria |

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| ICD-10-CM Diagnosis Code | Description |
|---|---|
| E80.21 | Acute intermittent (hepatic) porphyria |
| E80.29 | Other porphyria |
| E80.3 | Defects of catalase and peroxidase |
| E80.4 | Gilbert syndrome |
| E80.5 | Crigler-Najjar syndrome |
| E80.6 | Other disorders of bilirubin metabolism |
| E80.7 | Disorder of bilirubin metabolism, unspecified |
| E83.00 | Disorder of copper metabolism, unspecified |
| E83.01 | Wilson's disease |
| E83.09 | Other disorders of copper metabolism |
| E83.10 | Disorder of iron metabolism, unspecified |
| E83.11 | Hemochromatosis due to repeated red blood cell transfusions |
| E83.110 | Hereditary hemochromatosis |
| E83.111 | Hemochromatosis due to repeated red blood cell transfusions |
| E83.118 | Other hemochromatosis |
| E83.119 | Hemochromatosis, unspecified |
| E83.19 | Other disorders of iron metabolism |
| E85.0 | Non-neuropathic heredofamilial amyloidosis |
| E85.1 | Neuropathic heredofamilial amyloidosis |
| E85.2 | Heredofamilial amyloidosis, unspecified |
| E85.3 | Secondary systemic amyloidosis |
| E85.4 | Organ-limited amyloidosis |
| E85.81 | Light chain (AL) amyloidosis |
| E85.82 | Wild-type transthyretin-related (ATTR) amyloidosis |
| E85.89 | Other amyloidosis |
| E88.01 | Alpha-1-antitrypsin deficiency |
| E88.9 | Metabolic disorder, unspecified |
| G60.0 | Hereditary motor and sensory neuropathy |
| G60.1 | Refsum's disease |
| G60.2 | Neuropathy in association with hereditary ataxia |
| G60.3 | Idiopathic progressive neuropathy |
| G60.8 | Other hereditary and idiopathic neuropathies |
| I74.8 | Embolism and thrombosis of other arteries |
| I82.0 | Budd-Chiari syndrome |
| K70.30 | Alcoholic cirrhosis of liver without ascites |
| K70.31 | Alcoholic cirrhosis of liver with ascites |
| K71.0 | Toxic liver disease with cholestasis |
| K71.10 | Toxic liver disease with hepatic necrosis, without coma |

| POLICY TITLE | LIVER TRANSPLANT AND COMBINED LIVER-KIDNEY TRANSPLANT |
|---|---|
| POLICY NUMBER | MP-9.006 |

| ICD-10-CM Diagnosis Code | Description |
|---|---|
| K71.11 | Toxic liver disease with hepatic necrosis, with coma |
| K71.2 | Toxic liver disease with acute hepatitis |
| K71.3 | Toxic liver disease with chronic persistent hepatitis |
| K71.4 | Toxic liver disease with chronic lobular hepatitis |
| K71.5 | Toxic liver disease with chronic active hepatitis |
| K71.50 | Toxic liver disease with chronic active hepatitis without ascites |
| K71.51 | Toxic liver disease with chronic active hepatitis with ascites |
| K71.6 | Toxic liver disease with hepatitis, not elsewhere classified |
| K71.7 | Toxic liver disease with fibrosis and cirrhosis of liver |
| K71.8 | Toxic liver disease with other disorders of liver |
| K71.9 | Toxic liver disease; Toxic liver disease, unspecified |
| K74.1 | Hepatic sclerosis |
| K74.2 | Hepatic fibrosis with hepatic sclerosis |
| K74.3 | Primary biliary cirrhosis |
| K74.4 | Secondary biliary cirrhosis |
| K74.5 | Biliary cirrhosis, unspecified |
| K74.60 | Unspecified cirrhosis of liver |
| K74.69 | Other cirrhosis of liver |
| K75.4 | Autoimmune hepatitis |
| K75.81 | Nonalcoholic steatohepatitis (NASH) |
| K77 | Liver disorders in diseases classified elsewhere (code first underlying disease) |
| K83.01 | Primary sclerosing cholangitis |
| K83.1 | Obstruction of bile duct |
| M34.83 | Systemic sclerosis with polyneuropathy |
| Q44.2 | Atresia of bile ducts |
| Q44.6 | Cystic disease of liver |
| S36.112A | Contusion of liver, initial encounter |
| S36.112D | Contusion of liver, subsequent encounter |
| S36.114A | Minor laceration of liver, initial encounter |
| S36.114D | Minor laceration of liver, subsequent encounter |
| S36.115A | Moderate laceration of liver, initial encounter |
| S36.115D | Moderate laceration of liver, subsequent encounter |
| S36.116A | Major laceration of liver, initial encounter |
| S36.116D | Major laceration of liver, subsequent encounter |
| S36.113A | Laceration of liver, unspecified degree, initial encounter |
| S36.113D | Laceration of liver, unspecified degree, subsequent encounter |
| S36.113S | Laceration of liver, unspecified degree, sequela |
| S36.118A | Other injury of liver, initial encounter |

| POLICY TITLE | LIVER TRANSPLANT AND COMBINED LIVER-KIDNEY TRANSPLANT |
|---|---|
| POLICY NUMBER | MP-9.006 |

| ICD-10-CM Diagnosis Code | Description |
|---|---|
| S36.118D | Other injury of liver, subsequent encounter |
| T86.41 | Liver transplant rejection |
| T86.42 | Liver transplant failure |
| T86.49 | Other complications of liver transplant |
| Z52.6 | Liver donor |

## IX. REFERENCES

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1. *Kamath PS, Wiesner RH, Malinchoc M, et al. A model to predict survival in patients with end-stage liver disease. Hepatology. Feb 2001;33(2):464-470. PMID 11172350*
2. *Belle SH, Beringer KC, Detre KM. An update on liver transplantation in the United States: recipient characteristics and outcome. Clin Transpl. Jan 1995:19-33. PMID 8794252*
3. *Sheiner P, Rochon C. Recurrent hepatitis C after liver transplantation. Mt Sinai J Med. Mar-Apr 2012;79(2):190-198. PMID 22499490*
4. *Mukherjee S, Sorrell MF. Controversies in liver transplantation for hepatitis C. Gastroenterology. May 2008;134(6):1777-1788. PMID 18471554*
5. *Wang X, Li J, Riaz DR, et al. Outcomes of liver transplantation for nonalcoholic steatohepatitis: a systematic review and meta-analysis. Clin Gastroenterol Hepatol. Mar 2014;12(3):394-402.e391. PMID 24076414*
6. *Cholankeril G, Wong RJ, Hu M, et al. Liver transplantation for nonalcoholic steatohepatitis in the US: temporal trends and outcomes. Dig Dis Sci. Jul 25 2017;62(10):2915-2922. PMID 28744836*
7. *Schoenberg MB, Bucher JN, Vater A, et al. Resection or transplant in early hepatocellular carcinoma. Dtsch Arztebl Int. 2017 114(31-32):519-526. PMID 28835324*
8. *Zheng Z, Liang W, Milgrom DP, et al. Liver transplantation versus liver resection in the treatment of hepatocellular carcinoma: a meta-analysis of observational studies. Transplantation. Jan 27 2014;97(2):227-234. PMID 24142034*
9. *Guiteau JJ, Cotton RT, Washburn WK, et al. An early regional experience with expansion of Milan Criteria for liver transplant recipients. Am J Transplant. Sep 2010;10(9):2092-2098. PMID 20883543*
10. *Pomfret EA, Washburn K, Wald C, et al. Report of a national conference on liver allocation in patients with hepatocellular carcinoma in the United States. Liver Transpl. Mar 2010;16(3):262-278. PMID 20209641*
11. *Ioannou GN, Perkins JD, Carithers RL, Jr. Liver transplantation for hepatocellular carcinoma: impact of the MELD allocation system and predictors of survival. Gastroenterology. May 2008;134(5):1342-1351. PMID 18471511*

12. *Chan EY, Larson AM, Fix OK, et al. Identifying risk for recurrent hepatocellular carcinoma after liver transplantation: implications for surveillance studies and new adjuvant therapies. Liver Transpl. Jul 2008;14(7):956-965. PMID 18581511*
13. *Mazzaferro V, Regalia E, Doci R, et al. Liver transplantation for the treatment of small hepatocellular carcinomas in patients with cirrhosis. N Engl J Med. Mar 14 1996;334(11):693-699. PMID 8594428*
14. *Firl DJ, Kimura S, McVey J, et al. Reframing the approach to patients with hepatocellular carcinoma: Longitudinal assessment with HALTHCC improves ablate and wait strategy. Hepatology. Mar 31 2018. PMID 29604231*
15. *National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Hepatobiliary Cancers. Version 2.2018. British Transplantation Societ. Accessed July 30, 2018.*
16. *Murali AR, Patil S, Phillips KT, et al. Locoregional therapy with curative intent versus primary liver transplant for hepatocellular carcinoma: systematic review and meta-analysis. Transplantation. Jan 2017 101(8): e249-e257. PMID 28282359*
17. *Maggs JR, Suddle AR, Aluvihare V, et al. Systematic review: the role of liver transplantation in the management of hepatocellular carcinoma. Aliment Pharmacol Ther. May 2012;35(10):1113-1134. PMID 22432733*
18. *Chan DL, Alzahrani NA, Morris DL, et al. Systematic review of efficacy and outcomes of salvage liver transplantation after primary hepatic resection for hepatocellular carcinoma. J Gastroenterol Hepatol. Jan 2014;29(1):31-41. PMID 24117517*
19. *Zhu Y, Dong J, Wang WL, et al. Short- and long-term outcomes after salvage liver transplantation versus primary liver transplantation for hepatocellular carcinoma: a meta-analysis. Transplant Proc. Nov 2013;45(9):3329-3342. PMID 24182812*
20. *Gu J, Bai J, Shi X, et al. Efficacy and safety of liver transplantation in patients with cholangiocarcinoma: a systematic review and meta-analysis. Int J Cancer. May 1 2012;130(9):2155-2163. PMID 21387295*
21. *Heimbach JK. Successful liver transplantation for hilar cholangiocarcinoma. Curr Opin Gastroenterol. May 2008;24(3):384-388. PMID 18408469*
22. *Darwish Murad S, Kim WR, Harnois DM, et al. Efficacy of neoadjuvant chemoradiation, followed by liver transplantation, for perihilar cholangiocarcinoma at 12 US centers. Gastroenterology. Jul 2012;143(1):88-98.e83; quiz e14. PMID 22504095*
23. *Heimbach JK, Gores GJ, Haddock MG, et al. Predictors of disease recurrence following neoadjuvant chemoradiotherapy and liver transplantation for unresectable perihilar cholangiocarcinoma. Transplantation. Dec 27 2006;82(12):1703-1707. PMID 17198263*
24. *Rea DJ, Heimbach JK, Rosen CB, et al. Liver transplantation with neoadjuvant chemoradiation is more effective than resection for hilar cholangiocarcinoma. Ann Surg. Sep 2005;242(3):451-458; discussion 458-461. PMID 16135931*
25. *Pascher A, Jonas S, Neuhaus P. Intrahepatic cholangiocarcinoma: indication for transplantation. J Hepatobiliary Pancreat Surg. Nov 2003;10(4):282-287. PMID 14598146*

26. *Friman S, Foss A, Isoniemi H, et al. Liver transplantation for cholangiocarcinoma: selection is essential for acceptable results. Scand J Gastroenterol. Mar 2011;46(3):370-375. PMID 21073376*
27. *Meyer CG, Penn I, James L. Liver transplantation for cholangiocarcinoma: results in 207 patients. Transplantation. Apr 27 2000;69(8):1633-1637. PMID 10836374*
28. *Robles R, Figueras J, Turrion VS, et al. Spanish experience in liver transplantation for hilar and peripheral cholangiocarcinoma. Ann Surg. Feb 2004;239(2):265-271. PMID 14745336*
29. *Casavilla FA, Marsh JW, Iwatsuki S, et al. Hepatic resection and transplantation for peripheral cholangiocarcinoma. J Am Coll Surg. Nov 1997;185(5):429-436. PMID 9358085*
30. *Fan ST, Le Treut YP, Mazzaferro V, et al. Liver transplantation for neuroendocrine tumour liver metastases. HPB (Oxford). Jan 2015;17(1):23-28. PMID 24992381*
31. *Mathe Z, Tagkalos E, Paul A, et al. Liver transplantation for hepatic metastases of neuroendocrine pancreatic tumors: a survival-based analysis. Transplantation. Mar 15 2011;91(5):575-582. PMID 21200365*
32. *Hamilton EC, Balogh J, Nguyen DT, et al. Liver transplantation for primary hepatic malignancies of childhood: The UNOS experience. J Pediatr Surg. 2017 3468(17):30657-30657. PMID 29108844*
33. *Barrena S, Hernandez F, Miguel M, et al. High-risk hepatoblastoma: results in a pediatric liver transplantation center. Eur J Pediatr Surg. Jan 2011;21(1):18-20. PMID 20938901*
34. *Malek MM, Shah SR, Atri P, et al. Review of outcomes of primary liver cancers in children: our institutional experience with resection and transplantation. Surgery. Oct 2010;148(4):778-782; discussion 782-774. PMID 20728194*
35. *Browne M, Sher D, Grant D, et al. Survival after liver transplantation for hepatoblastoma: a 2-center experience. J Pediatr Surg. Nov 2008;43(11):1973-1981. PMID 18970927*
36. *Czauderna P, Otte JB, Aronson DC, et al. Guidelines for surgical treatment of hepatoblastoma in the modern era--recommendations from the Childhood Liver Tumour Strategy Group of the International Society of Paediatric Oncology (SIOPEL). Eur J Cancer. May 2005;41(7):1031-1036. PMID 15862752*
37. *Organ Procurement and Transplantation Network (OPTN). Policy 9: Allocation of Livers and Liver-Intestines. 2018; https://optn.transplant.hrsa.gov/media/1200/optn_policies.pdf#nameddest=Policy_01 Accessed February 11, 2020.*
38. *Bellido CB, Martinez JM, Artacho GS, et al. Have we changed the liver retransplantation survival? Transplant Proc. Jul 2012;44(6):1526-1529. PMID 22841203*
39. *Remiszewski P, Kalinowski P, Dudek K, et al. Influence of selected factors on survival after liver retransplantation. Transplant Proc. Oct 2011;43(8):3025-3028. PMID 21996216*
40. *Hong JC, Kaldas FM, Kositamongkol P, et al. Predictive index for long-term survival after retransplantation of the liver in adult recipients: analysis of a 26-year experience in a single center. Ann Surg. Sep 2011;254(3):444-448; discussion 448-449. PMID 21817890*

41. *Lunsford KE, Bodzin AS, Markovic D, et al. Avoiding futility in simultaneous liver-kidney transplantation: analysis of 331 consecutive patients listed for dual organ replacement. Ann Surg. May 2017;265(5):1016-1024. PMID 27232249*
42. *Fong TL, Khemichian S, Shah T, et al. Combined liver-kidney transplantation is preferable to liver transplant alone for cirrhotic patients with renal failure. Transplantation. Aug 27 2012;94(4):411-416. PMID 22805440*
43. *Ruiz R, Jennings LW, Kim P, et al. Indications for combined liver and kidney transplantation: propositions after a 23-yr experience. Clin Transplant. Nov-Dec 2010;24(6):807-811. PMID 20002463*
44. *Calinescu AM, Wildhaber BE, Poncet A, et al. Outcomes of combined liver-kidney transplantation in children: analysis of the scientific registry of transplant recipients. Am J Transplant. Dec 2014;14(12):2861-2868. PMID 25274400*
45. *de la Cerda F, Jimenez WA, Gjertson DW, et al. Renal graft outcome after combined liver and kidney transplantation in children: UCLA and UNOS experience. Pediatr Transplant. Jun 2010;14(4):459-464. PMID 20070563*
46. *Marcos A, Ham JM, Fisher RA, et al. Single-center analysis of the first 40 adult-to-adult living donor liver transplants using the right lobe. Liver Transpl. May 2000;6(3):296-301. PMID 10827229*
47. *Malago M, Testa G, Marcos A, et al. Ethical considerations and rationale of adult-to-adult living donor liver transplantation. Liver Transpl. Oct 2001;7(10):921-927. PMID 11679994*
48. *Renz JF, Busuttil RW. Adult-to-adult living-donor liver transplantation: a critical analysis. Semin Liver Dis. Feb 2000;20(4):411-424. PMID 11200412*
49. *Bak T, Wachs M, Trotter J, et al. Adult-to-adult living donor liver transplantation using right-lobe grafts: results and lessons learned from a single-center experience. Liver Transpl. Aug 2001;7(8):680-686. PMID 11510011*
50. *Shiffman ML, Brown RS, Jr., Olthoff KM, et al. Living donor liver transplantation: summary of a conference at The National Institutes of Health. Liver Transpl. Feb 2002;8(2):174-188. PMID 11862598*
51. *Grant RC, Sandhu L, Dixon PR, et al. Living vs. deceased donor liver transplantation for hepatocellular carcinoma: a systematic review and meta-analysis. Clin Transplant. Jan-Feb 2013;27(1):140-147. PMID 23157398*
52. *Cooper C, Kanters S, Klein M, et al. Liver transplant outcomes in HIV-infected patients: a systematic review and meta-analysis with synthetic cohort. AIDS. Mar 27 2011;25(6):777-786. PMID 21412058*
53. *Terrault NA, Roland ME, Schiano T, et al. Outcomes of liver transplant recipients with hepatitis C and human immunodeficiency virus coinfection. Liver Transpl. Jun 2012;18(6):716-726. PMID 22328294*
54. *Organ Procurement and Transplantation Network (OPTN). Organ Procurement and Transplantation Network Policies. 2018; https://optn.transplant.hrsa.gov/media/1200/optn_policies.pdf*

*Accessed February 11,2020.*

55. *Working Party of the British Transplantation Society. Kidney and Pancreas Transplantation in Patients with HIV. Second Edition (Revised). British Transplantation Society Guidelines. Macclesfield, UK: British Transplantation Society; 2017.*
56. *American Association for the Study of Liver Diseases, American Society of Transplantation. Liver transplantation, evaluation of the adult patient. 2013; https://www.aasld.org/publications/practice-guidelines-0.*

    *Accessed February 11, 2020.*
57. *Squires RH, Ng V, Romero R, et al. Evaluation of the pediatric patient for liver transplantation: 2014 practice guideline by the American Association for the Study of Liver Diseases, American Society of Transplantation and the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition. Hepatology. Jul 2014;60(1):362-398. PMID 24782219*
58. *National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Neuroendocrine and Adrenal Tumors. Version 2.2018. https://www.nccn.org/professionals/physician_gls/pdf/neuroendocrine.pdf.*

    *Accessed February 11, 2020.*
59. *National Comprehensive Cancer Network. Neuroendocrine and Adrenal Tumors. Version 1.2019. https://www.nccn.org/professionals/physician_gls/pdf/neuroendocrine.pdf*

    *Accessed February 11, 2020.*
60. *Centers for Medicare & Medicaid Services. National Coverage Determination (NCD) for Adult Liver Transplantation (260.1). 2012; https://www.cms.gov/medicare-coverage-database/details/ncd-details.aspx?NCAId=259&NcaName=Liver+Transplantation+for+Malignancies&ExpandComments=n&CommentPeriod=0&NCDId=70&ncdver=3&id=186&bc=gABAAAAAEEAAA%3D%3D&. Accessed February 11, 2020.*
61. *Centers for Medicare & Medicaid Services. National Coverage Determination (NCD) for Pediatric Liver Transplantation (260.2). 1991; https://www.cms.gov/medicare-coverage-database/details/ncd-details.aspx?MCDId=17&ExpandComments=n&McdName=Clinical+Pharmacology+Compendium+Revision+Request+-+CAG-00392&mcdtypename=Compendia&MCDIndexType=6&NCDId=71&ncdver=1&bc=AgAEAAAAAgAA&. Accessed February 11, 2020.*
62. *Yadav DK, Chen W, Bai X, et al. Salvage Liver Transplant versus Primary Liver Transplant for Patients with Hepatocellular Carcinoma. Ann Transplant. 2018 Aug 3;23:524-545. PMID: 30072683.*
62. *Blue Cross Blue Shield Association Medical Policy Reference Manual. 7.03.06, Liver Transplant and Combined Liver-Kidney Transplant. August 8, 2019.*

| POLICY TITLE | LIVER TRANSPLANT AND COMBINED LIVER-KIDNEY TRANSPLANT |
|---|---|
| POLICY NUMBER | MP-9.006 |

## X. POLICY HISTORY

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|---|---|
| **MP 9.006** | **CAC 2/25/03** |
| | **CAC 2/22/05** |
| | **CAC 3/28/06** |
| | **CAC 3/27/07** |
| | **CAC 3/25/08 Consensus.** |
| | **CAC 1/27/09** |
| | **CAC 1/26/10 Consensus** |
| | **CAC 4/26/11 Consensus review.** |
| | **CAC 4/24/12 Adopting BCBSA**. Changed title. Added ref to FEP policy manual. Neuroendocrine tumor metastases added to investigational statement. Policy statements on hepatocellular carcinoma that has extended beyond the liver and ongoing alcohol and/or drug abuse moved from investigational to not medically necessary. Removed "Patients with an active infection" from the investigational policy statement. The list below is medically necessary with changes in wording noted:<br>Biliary atresia (no longer specified as "for children with extrahepatic biliary atresia" End stage organ failure requirement was added).<br>Silent on Alagille syndrome<br>Familial amyloid polyneuropathy – Amyloidosis is not addressed<br>Silent on fulminant hepatic failure<br>For primary hepatocellular carcinoma – removed list of additional criteria.<br>Inborn errors of metabolism (removed "that threaten life")<br>Now silent on the following<br>Hepatopulmonary syndrome<br>Secondary biliary cirrhosis<br>Oxalosis<br>Chronic hepatitis<br>Fulminant hepatic failure (regardless of etiology)<br>Added the following as MN<br>Hemochromotosis<br>Polycystic disease of the liver<br>The list below is considered investigational:<br>Now silent on active infection<br>Added investigational indication for patients with neuroendocrine tumors metastatic to the liver.<br>Other investigational indications match<br>The list below is considered not medically necessary<br>Patients with hepatocellular carcinoma that has extended beyond the liver – was investigational.<br>Patients with ongoing alcohol and/or drug abuse – was investigational. Also removed exception for fulminant acute liver failure.<br>Benefit statement regarding artificial organs deleted. |
| | **CAC 11/26/13 Minor revision.** Non-alcoholic steatohepatitis cirrhosis was added |

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| | to the medically necessary policy statement; a statement added that retransplantation may be considered medically necessary; a statement added that hilar cholangiocarcinoma may be considered medically necessary. Intrahepatic cholangiocarcinoma was added to the investigational policy statement. Guidelines were moved to the policy section. Rationale added. Policy coded. |
| | **CAC 11/25/14 Minor review.** Policy statement on polycystic liver disease moved from list format to a separate policy statement. Added criteria for polycystic liver disease who have massive hepatomegaly causing obstruction or functional impairment. Pediatric non-metastatic hepatoblastoma added as may be medically necessary. Policy statement added that liver transplantation is considered investigational in all other situations not described. No coding changes. |
| | Consensus Reviewed and de-range the ICD -10 11/17/2014 |
| | **CAC 11/24/15 Consensus review.** No changes to the policy statements. Reference and rationale update. Coding updated. |
| | **CAC 11/29/16 Consensus review.** Policy statements unchanged. Variation reformatting completed. Rationale and Reference sections updated. Coding Reviewed/updated. |
| | **10/1/17 Administrative update.** Added new ICD 10 codes effective from 10/1/17 and deleted old ICD 10 codes. |
| | **1/1/18 Administrative update.** Medicare variations removed from Commercial Policies |
| | **CAC 1/30/18 Minor revision**. Combined liver-kidney transplantation added as medically necessary when criteria is met. Contraindication for smoking and HIV criteria added to Policy Guidelines. Policy title changed to "Liver Transplant and Combined Liver-Kidney Transplant." Cross-Reference, Description/Background, Rationale and Reference sections updated. Coding reviewed/updated. |
| | **10/1/18 Administrative update.** Removed deleted ICD-10 codes, added new codes effective 10/1/18. |
| | **1/24/19 Consensus review.** No change to policy statements. Background and references updated. Rationale condensed. |
| | **2/11/20 Consensus review.** No changes to policy statements. References Updated. |
| | **10/1/20 Administrative update.** Added new codes and removed end-dated codes effective 10-1-20. |

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