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**Policy: Pre-Liver and Liver/Kidney Transplant Medical Selection Criteria of Recipients Protocol**  
  
**Statement: 1. Activation date: June 25, 2007**  
**2. Affected Department:** LiverTransplant Program  
**3. Vision Strategy:** Patient Care  
**4. Policy Statement:** The Emory Transplant Center will comply with all applicable federal, state and local laws, regulations and policies.   
**5. Basis**: This policy is necessary to provide guidelines for selection of potential liver transplantation and for the protection of patients, physicians and staff  
**6. Administrative Responsibility:** Section heads, physicians, practitioners, and staff are responsible for compliance with this policy.  
  
  
**Scope/Procedure:**

**Overview:**

The National Institutes of Health guidelines for liver transplantation state that the procedure is indicated in patients with acute or chronic end stage liver disease for whom no other therapy has been shown to be efficacious and before the patient is so overwhelmed by the diseaseprocess that there is no hope for survival. The main stigmata of liver disease include jaundice, ascites, encephalopathy, malnutrition, and variceal bleeding. Other constitutional complications that may significantly diminish quality of life and severely impair a patient’s ability to function in society include intractable pruritus, hepatic osteodystrophy, renal dysfunction (hepato-renal syndrome), and incapacitating fatigue. Recurring episodes of biliary sepsis or spontaneous bacterial peritonitis are also indications to proceed with liver transplantation.

All patients referred to Emory University Hospital for liver transplantation undergo rigorous medical, psychological, and social evaluations. The medical evaluation includes a complete history and physical examination and, as required based on available prior evaluations, a work-up to determine the etiology and severity of the liver disease. The initial evaluation is designed to determine, primarily utilizing the MELD score, if the patient’s short-term mortality risk is sufficiently high to justify immediate preparation for transplant. If the MELD score is low, the transplant physicians concentrate on management of the patients’ liver disease complications such as ascites, encephalopathy and potential for esophageal and/or gastric variceal hemorrhage. This management is often conducted in cooperation with the patients’ referring gastroenterologists. If the MELD score is high enough to consider immediate preparation for liver transplantation, the evaluation proceeds as follows.

The second phase of the evaluation is an assessment of medical contra-indications to transplantation. Once it is shown that the liver disease is best treated by transplantation, it must be determined that the patient has a reasonable chance of both immediate and long-term survival.

The final phase of the evaluation includes psychological and social assessments to determine if there are psychosocial contraindications to liver transplantation. The patient must be able to conform to a demanding medical regimen and demonstrate adequate social support necessary for a successful outcome after transplantation.

On the basis of these evaluations a decision is made by the liver transplant team regarding the advisability of liver transplantation. Each case is presented to an interdisciplinary Liver Transplant Evaluation Conference (which meets weekly and is attended by all available members of the Liver Transplant Service) where a consensus is reached on the appropriateness of transplantation.

**Etiology and Staging**

Essential to the work-up of the potential candidate for liver transplantation is establishment of the primary diagnosis, whenever possible, stage and prognosis of disease, liver size, portal vein patency, and in the case of patients suspected of having hepatic tumors, determination of the extent of disease. The etiology of the disease is determined by history and specific laboratory tests including, but not limited to, viral hepatitis serology (HBsAb, HBsAg, HBeAg, HBcAb, HCV-Ab); alpha-1-antitrypsin level and Pi phenotype; ceruloplasmin; anti-nuclear, anti-mitochondrial, and anti-smooth muscle antibody titers; serum iron and TIBC, ferritin; serum protein electrophoresis; alpha-fetoprotein, and CEA. Liver biopsy may also be needed, to determine both etiology and stage of disease. Many patients are referred to Emory for liver transplantation with a well-established diagnosis. Only selected studies necessary to complete the evaluation are performed in these cases.

Staging of the severity of disease was previously based on the Child-Pugh system, but is now based on the Model for End-stage Liver Disease or MELD score. Portal vein patency can usually be determined by a non-invasive Doppler ultrasound study, but MRI, CT portagram or venous phase angiography may be required in selected cases. MRI or CT scanning is useful to detect the presence of tumors, with or without extrahepatic extension.

Transplantation for cirrhotic patients with hepatocellular carcinoma (HCC) is now carefully regulated. UNOS criteria, based on the Milan Criteria (Mazzaferro V., et al, NEJM, 1996;334:693-699) guide listing of patients with HCC, providing a MELD allowance for patients meeting the criteria. These criteria do not determine which patients a transplant program may or may not list, but rather provide MELD upgrades to reduce patient drop-out on the waiting list. This allowance system has effectively heightened awareness of the importance of HCC screening in high-risk populations. All patients evaluated in the Emory Liver Transplant Program are considered for HCC screening whether or not transplantation is imminent.

There have been occasional long term survivors after liver transplantation for cholangio-carcinoma or bile duct cancer. Protocols utilized at the Mayo Clinic and the University of Nebraska have demonstrated the importance of careful preoperative staging and treatment of these patients in order to achieve acceptable long-term results after liver transplantation. Therefore, liver transplantation may be considered in carefully selected patients with cholangiocarcinoma.

The psychiatric and social assessment of the patient is an essential component of the liver transplant evaluation. Any behavioral abnormality which might interfere with patient compliance must be identified and if an acceptable plan for management cannot be developed, the patient may be denied candidacy. Plans for long-term adherence to a disciplined medical regimen must be feasible and realistic for the individual patient. The arduous post-transplant course requires emotional fortitude and family support to provide optimal conditions for success and rehabilitation. The patient must have a strong desire to live and a stable, supportive social environment. It is highly desirable that patients have a vocation to which they may be able to return following transplantation. The patient should have family or other personal relations who are able and willing to make a long- term commitment to providing emotional support during the pre- and post-transplantation periods. The family or social constellation should be able and willing to tolerate the stresses of liver transplantation. Resources must be available to the patient for travel to and from the transplant center accompanied by a supportive family member for evaluation of transplantation candidacy and pre-transplant medical care; for living expenses for the patient and family while in the transplant center area before, during and after transplantation; and for periodic travel to the transplant center for routine medical follow-up, the treatment of severe rejection episodes, or other complications. The patient and family must be knowledgeable about the short and long term risks of transplantation and the challenges associated with long term immunosuppression.

**General Considerations:**  
  
***Advanced age****:* Excellent survival for patients over the age of sixty at the time of liver transplantation has been reported by several liver transplant centers. Advanced chronological age is therefore only a relative contraindication to transplantation. Patients should have the potential for return to a healthy lifestyle, regardless of age, following transplantation. Non-hepatic organ dysfunction must be reversible. In general, the goal is to select patients who have a high likelihood of becoming healthy, productive, functional individuals with a reasonable life expectancy of at least five to ten years after transplantation.

***Vascular disease****:* Systemic, cerebral and peripheral atherosclerotic vascular diseases are indicators of physiologic aging and increased risk of ischemic end-organ complications and progression of disease after liver transplantation. All patients over the age of 50 undergo a cardiac screening examination. Younger patients are also screened if there is a clinical indication.

***Morbid obesity***: Obese patients represent a challenging subset of patients in the liver transplant clinic. Obesity, defined as a Body Mass Index (BMI) over 30, is often associated with other metabolic issues including hypertension, diabetes mellitus, hyperlipidemia, and degenerative joint disease and reduced mobility. However, studies have shown that patients with BMI values of 35-40 have good outcomes after transplantation, albeit longer hospital stays. Patients with BMI values over 40 should be required to undergo intensive weight loss efforts but no BMI, *per se*should preclude liver transplantation in selected patients.

***Renal dysfunction****:* Reversible hepatorenal syndrome is common in patients with end stage liver disease and is not a contraindication to liver transplantation. However, irreversible renal dysfunction is a contraindication to transplantation due to the toxicity of immunosuppressive agents, decreased tolerance of infectious complications, and the life expectancy constraints imposed by such organ disorder. Absolute levels of such abnormalities are not easily definable. Reduced kidney size as determined by CT scan suggests irreversible advanced renal disease. Patients with end stage renal disease may be considered for combined liver-kidney transplantation.

***Combined Liver/Kidney Transplantation****:*

In patients with end stage liver disease, there is a demonstrable risk of renal dysfunction due to the physiologic stress that ESLD causes on other organ systems. For the vast majority of patients, this is a self-limiting phenomenon that improves with liver transplantation alone. Unfortunately, in a small subset of patients, this physiologic insult uncovers underlying renal disease that may not improve after liver transplantation. Moreover, the stress of surgery may actually push this small cohort into dialysis dependence. In these patients with underlying renal disease, a decision will be made as to whether to offer them a combined liver/kidney transplant.

All patients in the evaluation process will undergo a 24-hour urine study. In those patients with CrCl <50, the transplant team will assess their risk of chronic kidney disease (CKD) based on imaging and history. In those patients with normal renal mass and absence of risk factors (hypertension, smoking, diabetes, etc.), it is likely that a liver alone transplant will be offered. In those patients with known intrinsic renal disease (CKD), or known risk factors for CKD, evaluation by one of our transplant nephrologist will be performed. Based on that evaluation, we will proceed with dual listing for liver and kidney transplant versus liver transplant alone.

All patients evaluated for renal transplant will need documentation of femoral pulses by one of the transplant surgeons. If there are vascular issues, further imaging will be ordered at the discretion of the surgeon

***Portal vein thrombosis****:* Patients with long-standing cirrhosis, especially those with small, shrunken livers, are prone to pathologic changes in the portal vein which may lead to portal vein thrombosis. In many cases, it is possible to thrombectomize the vein even in the face of a well organized, long standing thrombus. However, when this is not possible, an extra-anatomic reconstruction of the portal vein using iliac vein graft from the liver donor is often possible if a major mesenteric vein is patent. Angiography is sometimes required prior to transplantation to evaluate this problem. Prior surgical shunts, spontaneous shunts, and other prominent collaterals must be surgically interrupted when feasible, at the time of transplantation, to prevent steal from the portal vein.

**Disease specific considerations:**

**Cholestatic liver disease*:***Patients with sclerosing cholangitis are at increased risk of developing cholangiocarcinoma. Percutaneous transhepatic cholangiography or ERCP with brushings may be obtained to rule out malignancy that may be a contraindication to transplantation. Institution of the MELD criteria for liver transplantation candidate selection has essentially eliminated the perceived prejudice of the Child-Pugh scoring system which used higher bilirubin levels in cholestatic patients. In patients with PSC, other considerations for listing for transplant might include bile ducts that can no longer be mechanically dilated and/or episodes of cholangitis, intractable pruritus, incapacitating fatigue, and advancing hepatic osteodystrophy. Unfortunately, none of these issues are recognized by the MELD system and only through special appeals might such patients receive consideration.

**Budd-Chiari syndrome:**Patients with acute Budd-Chiari syndrome can usually be managed with surgical and/or interventional radiology techniques. Patients with chronic Budd-Chiari syndrome require transplantation when advanced fibrosis or cirrhosis complicates obstructed venous outflow.

**Viral hepatitis:**Patients with chronic active hepatitis B who are HBsAg positive are acceptable as candidates for transplantation. . All patients receive active immunization with recombinant vaccine before transplantation and passive immunoprophylaxis with hyperimmune globulin beginning at surgery and repeated at regular intervals for at least one year. Although it has been traditional to exclude patients with significant titers of HBV-DNA or patients positive for HBeAg from consideration for transplantation, recent results suggest that passive immunization with hyperimmune globulin to maintain titers in excess of 500 units permits successful transplantation of these patients. We, therefore, accept such patients for transplantation on a case-by-case basis.

Patients with chronic active hepatitis C are accepted for transplantation, provided there are no other contraindications.

**Alcoholic liver disease:** Patients with a history of alcohol dependence must have evidence of sufficient social support to assure maintenance of sobriety. Transplantation is generally not offered to patients unless abstinence has been documented for at least six months. However, no study has definitively shown that such brief periods of abstinence are good predictors of postoperative recidivism. Therefore, the Emory Liver Transplant Program may, in selected cases, decide that transplantation may be appropriate with abstinence periods of less than 6 months. Patients are usually required to complete an alcohol treatment program for educational and supportive purposes and to have an approved relapse prevention plan. Based on an individual’s history and family dynamics, the transplant team may recommend an alcoholic rehabilitation program for a potential transplant candidate even though the recommended period of abstinence has been met. Failure of the patient to meet the recommendations of the liver transplant evaluation committee will lead to concerns about candidacy and could result in denial or removal from the active waiting list. Alcoholic patients are also screened for evidence of cardiomyopathy and central nervous system damage, contraindications to transplantation.

Patients with a history of abuse of alcohol or other substances frequently engage in other self-destructive behaviors including cross addictive behavior with use of narcotics, stimulants, or sedatives, or illicit substances such as marijuana, cocaine, or heroin. Patients actively using such substances at the time of evaluation, even if abstinent from alcohol, are unsuitable candidates for transplantation. All patients with a prior history of substance abuse must agree to submit to random blood and urine tests for alcohol and other forbidden substances if accepted as candidates for transplantation. A single positive screen may result in denial of candidacy or removal from the active waiting list. Furthermore, failure to comply with a request for a random screen may be interpreted as a positive test. The evaluation of patients with fulminant hepatic failure and certain positive drug screens deserves special consideration and is discussed under the heading of Fulminant Hepatic Failure below.

**Polycystic liver disease:**Polycystic liver disease rarely leads to liver failure, but the liver may enlarge to drastic proportions causing displacement of other intra-abdominal viscera, limitation of diaphragmatic excursion with respiratory compromise, and intolerable discomfort. Liver transplantation is curative and highly effective in restoring quality of life for these patients. If significant polycystic renal disease with renal failure is also present, combined kidney-liver transplantation can be offered.

**Fulminant hepatic failure**:Patients with fulminant liver failure are aggressively managed by a multidisciplinary team consisting of specialists in hepatology, liver transplantation, neurosurgery, and intensive care. A clinical pathway for management of acute hepatic failure has been developed. Cerebral perfusion pressure (CPP) monitoring is considered to be a valuable guide to management and selection for transplantation and is instituted in patients with grade III or higher encephalopathy. Establishment of etiology is an important guide to prognosis. Most patients with acetaminophen toxicity and nearly all patients with acute hepatitis recover without transplantation. Patients with fulminant hepatitis B recover about 50% of the time, but patients with fulminant non-A, non-B hepatitis or toxic hepatitis usually require transplantation. Maintenance of neurologic integrity is the most challenging hurdle to successful transplantation in these patients and is best accomplished through the cooperation of the multidisciplinary team described above. The psychosocial evaluation of the fulminant liver failure patient is often challenging, given the immediacy involved. The Emory program typically will accept for transplantation, a patient who impulsively overdoses on acetaminophen in the absence of severe prior psychiatric disease or substance abuse. Furthermore, a fulminant liver failure patient with evidence of marijuana or alcohol use may be found to be an appropriate candidate for transplantation after careful investigation of prior behavior and social support systems. Evidence of cocaine or heroin use usually indicates a more severe substance abuse problem and will, in almost every case, exclude the patient from consideration.

**Cancer:**Patients with hepatocellular carcinoma confined to the liver who are not candidates for subtotal hepatic resection will be considered for liver transplantation only if there is convincing evidence on preoperative screening tests, including imaging studies, which the patient’s tumor conforms to the Milan Criteria. Patients with evidence of extrahepatic tumor spread, including invasion of major hepatic veins, the inferior vena cava, or major branches of the portal vein, are not acceptable candidates for liver transplantation nor are most patients with metastatic carcinoma in the liver from extrahepatic primary tumors. Patients with primary or metastatic carcinoid tumors and with primary epithelioid hemangioendothelioma of the liver, or tumors which often recur only after a long disease-free interval are considered on a highly selective basis for transplantation.

**Hepatopulmonary Syndrome and Portopulmonary hypertension:**These two conditions often complicate the management of patients with end stage liver disease. Hepatopulmonary Syndrome may be associated with intrapulmonary shunting with hypoxemia. When recognized, a MELD exception is automatic. Careful quantitative assessment of the degree of shunting and the extent of hypoxia is essential in the proper selection of these patients. Ideally, all patients with proven hepatopulmonary syndrome should undergo macroaggregate albumin scanning to quantitate the shunt present. All transplant candidates should have an arterial blood gas assessment, standing and on room air, and if the PaO2 is <70%, the PaO2 should be reassessed while the patient is breathing 100% oxygen. If the PaO2 is less than 300 mm Hg on 100% oxygen, the patient should undergo pulmonary angiography to determine if large (type II) intrahepatic shunts, that might be amenable to coil embolization, are present. Although no specific exclusion criteria exist, mortality is highest in patients in whom the pretransplant PaO2 is <50 mmHg, and the brain uptake on **99mTc MAA** lung perfusion scans is >30%.

Pulmonary hypertension occurs in these patients in varying degrees. Mild to moderate pulmonary hypertension is often manageable but severe pulmonary hypertension is uncorrectable with liver transplantation and such patients are prone to cardiac arrest during surgery. When this condition is suspected based on screening echocardiography,, right heart catheterization is necessary to determine the degree of pulmonary hypertension and right ventricular dysfunction. The reactivity of the pulmonary bed can also be assessed using vasodilators. Krowka et al (Hepatology 2006; 44:1502) recently published their 10 year experience with a screening algorithm used to evaluate patients with portopulmonary hypertension. Based on their experience, patients with an estimated right ventricular systolic pressure >50 mm Hg should undergo right heart catheterization. At catheterization, the assessment of the diagnostic criteria proposed by the European Respiratory Society-European Association for the Study of the Liver may be performed including:

1) Mean pulmonary artery pressure (MPAP) ≥ 25 mm Hg

2) Pulmonary vascular resistance (PVR) ≥ 250 dynes/s/cm-5  
3) Pulmonary artery occlusion pressure (PAOP) <15 mm Hg

Patients who have a MPAP <35 mm Hg may undergo liver transplantation with impunity. If the MPAP is >35 mmHg but < 50 mmHg, but the PVR is >250 dynes/s/cm-5 patients can still undergo transplantation. However, transplantation is contraindicated if the MPAP is >50 mm Hg or if the PVR is >250 dynes/s/cm-5 and the MPAP is >35 mm Hg. Once successfully treated, however, these patients usually qualify for a MELD exception through the regional review board process.

**Systemic disease:**A number of systemic diseases that limit life expectancy, or that would be exacerbated by immunosuppression, are relative contraindications to transplantation. Systemic lupus erythematosis, sarcoidosis, and quiescent tuberculosis are examples where extent and severity require individual assessment to determine whether transplantation can be performed safely. Diabetes mellitus may increase the risk for complications (infection, vascular disease and renal insufficiency) and can be more difficult to control after transplantation. Glucose intolerance that is easily controlled does not preclude liver transplantation. Patients with severe complications of diabetes including cerebrovascular, coronary, or peripheral vascular disease are generally not candidates for liver transplantation. Sclerosing cholangitis is often associated with inflammatory bowel disease which must be under adequate medical control prior to liver transplantation. Prior colectomy and ileostomy for management of inflammatory disease of the colon is not a contraindication to transplantation and sometimes must be performed prior to transplantation when the colon disease is poorly controlled. Pulmonary function tests are performed to assess the presence of any significant restrictive or obstructive disease that might preclude liver transplantation. At Emory, all patients who smoke are encouraged to stop all tobacco use. Patients who have developed evidence of cardiovascular or pulmonary disease, however, may be required to demonstrate evidence of smoking cessation in order to be considered for liver transplantation.

**Infectious disease:**A careful history of childhood infections and travel or other potential infection exposure, including to tuberculosis, must be obtained. Skin tests for tuberculosis and common fugal pathogens and antibody titers for cytomegalovirus and Epstein-Barr virus are obtained. Patients with no evidence of prior exposure to cytomegalovirus should receive tissue and blood products from CMV negative donors whenever feasible. A positive history of tuberculosis exposure, prior active tuberculosis, or a positive skin test mandates prophylactic antituberculous therapy. All candidates are screened for HIV. Liver transplantation in HIV positive patients is not offered at many programs in the US but is appropriate in carefully selected patients.

**Specific Indications for Liver Transplantation**

Liver transplantation is currently indicated for the following causes of end stage liver disease:

Primary biliary cirrhosis

Sclerosing cholangitis

Genetic/metabolic disorders based in the liver (including but not necessarily limited to alpha-1-antitrypsin deficiency, tyrosinemia, Wilsons disease, glycogen storage disease, hemochromatosis, cystic fibrosis)  
  
Postnecrotic cirrhosis (including autoimmune hepatitis, hepatitis C and hepatitis B)  
  
Alcoholic cirrhosis  
  
Polycystic liver disease  
  
Benign hepatic tumors not amenable to subtotal resection  
  
Fulminant hepatic failure  
  
Secondary biliary cirrhosis  
  
Hepatic allograft failure

**In selected cases, liver transplantation is also considered for:**

1. Primary hepatoma, single lesions less than 5 cm, or three or fewer lesions less than 3 cm, without invasion of major vascular structures or extrahepatic spread   
  
2. Hepatoblastoma in children

3. Carcinoid tumors

4. Epithelioid hemangioendotheliomas of the liver

5. Other rare conditions as determined by the transplant physicians and surgeons  
  
**Contraindications for Liver Transplantation**  
**Absolute contraindications**

Advanced systemic disease involving one or more other organ systems

Systemic sepsis outside the liver or biliary tree  
  
Presence of malignancy outside the liver (See above exceptions)  
  
Hemodynamic compromise with vital organ dysfunction

Advanced pulmonary hypertension (PA systolic > 50 mm Hg)

Thrombosis of the mesenteric venous system to the extent that a satisfactory portal venous anastomosis cannot be surgically constructed

Behavioral or psychiatric disorder that will interfere with the adherence to a disciplined medical regimen

Lack of adequate social and family support or poor rehabilitative potential

Active alcohol or other substance abuse (see above exceptions)

Extensive hepatocellular cancer (evidence of vascular invasion)

**Relative Contraindications**

The following conditions may contraindicate liver transplantation:

Advanced chronic renal disease  
  
Portal vein thrombosis  
  
Severe hypoxemia  
  
Extensive prior upper abdominal surgery  
  
Pregnancy  
  
HIV positive serology  
  
Multiple prior liver transplantations  
  
Need for transplantation of another organ

**Liver Transplantation Evaluation Protocol**

Except where acceptable data is available from referring physicians, all patients will have:

Chest film, EKG, and MRI or CT of liver and abdomen (liver size, pancreas, spleen, portal vein, vena cava, bile ducts, gall bladder).

SMA-12, SMA-7, gGTP, CBC with differential, PT/PTT, clotting factors (fibrinogen; factors V, VII, VIII), platelets, reticulocyte count, ABO typing and antibody screen (on two occasions as required by UNOS), urinalysis, 24 hour urine collection for creatinine clearance. EGD and Colonoscopy are required consistent with current screening protocols recommended nationally.

Alpha-fetoprotein, pre-albumin, transferrin, ceruloplasmin, alpha-l-antitrypsin level and Pi phenotype; anti-nuclear antibody, anti-mitochondrial antibody, anti- smooth muscle antibody, anti-microsomal antibody; ferritin, serum protein electrophoresis; alpha-fetoprotein, CEA, and CA 19-9.

Arterial blood gases, pulmonary function tests, and dobutamine stress echocardiogram;

Infectious disease screen: PPD, hepatitis screen (HBsAg, anti-HBc, anti-HBs, anti HCV, HCV PCR and genotype, and in patients with a positive HBsAg, HBeAg and HBV-DNA), CMV and EBV antibody titers, and HIV

A nutrition consult, anesthesia consult, and a psychosocial evaluation (psychiatry and social service consults) are ordered for all patients. Patients are also evaluated by a clinical transplant coordinator (a clinical nurse specialist). (See lab evaluation protocol for other labs

All women should have mammography (age >35) and pap smears within the past year and annually while on the waiting list.

The following additional tests are indicated in selected patients:

Echocardiogram  
EEG (if subclinical encephalopathy suspected)  
First pass radionucleid angiogram and/or cardiac catheterization  
Ophthalmology consult for iritis, K-F rings  
ERCP or percutaneous transhepatic cholangiography  
CT head (cerebral atrophy, metastatic disease)  
Cultures (urine, blood, ascites, sputum, spinal fluid, etc.)  
Liver biopsy  
Pregnancy test  
Femoral pulses for liver/kidney transplant consideration  
MRI and/or angiography (to evaluate portal and mesenteric vein patency)  
Cardiology and other specialty consultations as needed  
Dobutamine stress echocardiogram or stress thallium myocardial scan as indicated

**Donor selection criteria**

The age of the donor is usually 5 to 80 years. Other criteria include:

Absence of sepsis

No malignancy (except for minor skin cancers)

No significant trauma to the liver

A minimal history of prior transfusion is preferred

In cases where the donor meets any criteria for increased risk of transmitting HIV, HBV, and HCV according to *US Public Health Services (PHS) Guidelines*, a thorough discussion will occur with the recipient.

**Patient Selection Process**

The liver transplant team is composed of transplant surgeons, hepatologists, anesthesiologists, a psychiatrist, a dietitian, a pharmacist, transplant social workers, clinical nurse specialists, and liver transplant coordinators. All of the team is involved in the transplant candidate evaluation.

The transplant social worker participates in the psychosocial and family assessment of transplant candidates, is a co-leader of support groups, and actively assists patients and families throughout the transplant process. The pretransplant clinical coordinator evaluates candidates, supervises patient education, and coordinates care during the pretransplant period. The post-transplant clinical coordinator arranges discharge planning and postoperative outpatient care and follow-up.

Management of the liver transplant candidate is complex and requires expertise in many fields. Therefore, other medical team members who participate in various aspects of the transplant process either routinely or as consultants include infectious disease specialists, the director of histocompatibility and blood banking, hematologists, pathologists, nephrologists, and pulmonary medicine physicians.

All patients are reviewed at the weekly interdisciplinary Liver Transplant Evaluation Conference. Each case is presented by the hepatologists and surgeons and other team members then contribute their evaluations. The decision to accept a patient on the liver transplant waiting list is achieved by a consensus among all the team members participating in the conference.

**Retransplantation**

Retransplantation is aggressively pursued for patients with primary graft failure or vascular compromise of a prior graft and for those with irreversible allograft rejection. Provided the patient can be sustained in a reasonable condition, retransplantation is often successful in these cases. Moribund patients and patients with multisystem organ failure are not considered appropriate candidates for retransplantation.

Patients with recurrent hepatitis B or recurrent neoplasms of the liver are not offered retransplantation except under experimental protocol. There is insufficient published data to recommend against re-transplantation for patients with recurrent hepatitis C. Therefore, at the present time we will consider for retransplantation, patients with recurrent hepatitis C provided they meet other acceptance criteria for liver transplantation. Patients with either cholestatic liver diseases such as primary biliary cirrhosis or sclerosing cholangitis or autoimmune hepatitis may develop recurrent disease in the liver allograft, although allograft loss is unpredictable. We will consider such patients for retransplantation.

Patients with recurrent alcohol related liver disease and patients who have complications from non-compliance are not candidates for retransplantation. It is also rare for patients to be offered more than one retransplantation, except in certain extraordinary circumstances where the likelihood of success is considered very high.

When a patient is placed on a waiting list or is selected to receive a transplant, specific selection criteria that were used to place the patient on the waiting list are documented in the medical record by the transplant coordinator. If a patient undergoes a formal transplant evaluation and a decision is made not to list, the specific selection criteria that were not met will be documented in the medical record by the transplant coordinator.   
  
In rare circumstances, exceptions to the selection criteria are allowed. When exceptions are made, the patient circumstances are discussed in the multidisciplinary team selection conference. Justification for the exception is documented in the medical record.

Approved by: Liver Transplant Leadership Group

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Approval Dates: 6/25/07, 12/19/07, 04/14/08, 3/11/11, 1/31/12, 4/16/15

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| **Regulatory References:** |  |

**Related Policies/Procedures:**   
  
  
  
**Approved By**  
**Transplant Leadership Group**   
  
**Key Words For Search:** pre liver, liver transplant, selection

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