

Factors in Patient Referral for Liver Transplantation

MELD Scoring & Waiting Times

(Range: 6-40, Adult Patients)

To determine a patient's MELD score, go to www.unos.org and access "Resources"

Score 6 - 12: Too early for transplant consideration

Score 12 - 15: May begin evaluation depending on symptoms

Score >15: Will be able to receive offers for an organ from UNOS.

Exceptions can be made for conditions such as HCC and hepatopulmonary syndrome to be reviewed by the internal review board at UNOS.

Waiting times vary based upon MELD score, blood group and weight range. Priority is given to the sickest patient awaiting a liver transplant. Patients are listed according to their MELD score; at the time an organ is offered, whoever has the highest score and is physically able to undergo surgery, will receive the liver.

Fulminant Hepatic Failure in the ICU, where the patient is not expected to live 7 days, is the highest priority for receiving an organ and is not affected by the MELD system.

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Conditions Leading to Transplantation

Hepatocellular:

- Chronic hepatitis B or C
- Alcoholic liver disease
- Drug induced liver disease
- Autoimmune hepatitis
- Cryptogenic hepatitis

Cholestatic:

- Primary biliary cirrhosis (PBC)
- Primary sclerosing cholangitis (PSC)
- Biliary atresia - in children

Metabolic liver disease

- Budd-Chiari syndrome
- Selected hepatic malignancies
- Fulminant liver failure

Indications

- Intractable pruritus
- Recurrent cholangitis
- Intractable ascites
- Hepatic osteodystrophy
- Severe lethargy
- Encephalopathy
- Variceal bleeding
- Hepatic hydrothorax
- Hepato-pulmonary syndrome
- Spontaneous bacterial peritonitis

Contraindications

Absolute Contraindications:

- HIV
- Extrahepatic malignancy
- Uncontrolled extrahepatic infection
- Active substance abuse – If < 1 year sobriety, a minimum of 6 month well-documented, weekly attendance in rehabilitation program is required
- Advanced cardiopulmonary disease
- Moderate to severe pulmonary hypertension
- Inability to comply with immunosuppressive regimen.

Relative Contraindications:

- Cholangiocarcinoma
- Hepatocellular cancer >5cm
- Patients with replicating hepatitis B
- Advanced age
- Advanced metastatic liver cancer
- Other severe co-morbidities
- Lack of socioeconomic support.

Evaluation of the Patient Prior to Liver Transplantation

Routine Blood Chemistries/Screening:

- ⇨ CMP with GGT
- ⇨ Direct bilirubin
- ⇨ Magnesium
- ⇨ CBC with differential and platelets
- ⇨ PT, PTT
- ⇨ Blood type
- ⇨ TSH
- ⇨ T4
- ⇨ CA 19-9 if PSC
- ⇨ Alpha-fetoprotein
- ⇨ PSA (in male patients >50 years old)

Etiology:

- ⇨ HBsAg, anti-HBc, anti-HBs
 - +HBsAg: HBV-DNA, HBeAg, anti-HBe, HDV.
 - Isolated anti-HBc: HBV-DNA.
- ⇨ anti-HCV
 - HCV-RNA by PCR in anti-HCV negative patients with no other known cause of liver disease or in anti-HCV positive patients and a Hep C Genotype.
- ⇨ anti-HAV
- ⇨ AMA, ANA, anti-smooth muscle
- ⇨ Serum protein electrophoresis: in patients with cryptogenic or autoimmune.
- ⇨ alpha-1-antitrypsin phenotype (Pi typing)
- ⇨ ceruloplasmin: in patients ≤ 40 years of age.
- ⇨ Fe, TIBC, Ferritin

Anatomy:

- ⇨ Ultrasound with doppler of portal vein, hepatic vein, hepatic artery and vena cava.
- ⇨ CT of liver, 3 phase.

Endoscopic Evaluation:

- ⇨ Colonoscopy: if >50, family history of colon cancer/polyps, history of ulcerative colitis/PSC/lower G.I. symptoms and heme + stools.
- ⇨ Upper Endoscopy (EGD): if patient needs staging of varices, needs treatment/evaluation of upper GI or variceal bleeds or if upper GI symptoms.
- ⇨ ERCP: in patients with PSC, ulcerative colitis/chronic diarrhea, unexplained cholestasis, history of significant biliary disease or cryptogenic cirrhosis.

Infectious:

- ⇨ HIV
- ⇨ CMV titers
- ⇨ EBV titers
- ⇨ Varicella-zoster titers
- ⇨ PPD with anergy battery
- ⇨ RPR
- ⇨ Stool for O&P x 3: in patients with history of living in/significant travel to areas with endemic parasitic diseases, unexplained diarrhea/lower G.I. symptoms or eosinophilia.
- ⇨ Toxoplasmosis titer and cryptococcus antigen when specifically indicated.

Recommended Vaccines:

- ⇨ Heptavax if not immune
- ⇨ Pneumovax
- ⇨ Hep A vaccine if neg. anti-HAV
- ⇨ Tetanus.

Patient Physiology:

Cardiac Evaluation:

- ⇨ EKG
- ⇨ 2-D echocardiogram: must include estimated pulmonary artery pressure.
- ⇨ Dobutamine Stress Echocardiogram: in patients >50, history of diabetes, history of prior heart disease, strong family history of premature heart disease, or abnormal EKG/echocardiogram.

Pulmonary Evaluation:

- ⇨ Chest X-ray, PA & Lateral
- ⇨ ABG
- ⇨ Pulmonary Function Tests (WITH ABG): if smoking history, history of asthma/other pulmonary disease, alpha-1-antitrypsin disease, unexplained dyspnea, strong family history of emphysema in nonsmokers.

Renal Evaluation:

- ⇨ Urinalysis with sediment
- ⇨ 24 hour urine creatinine clearance: in patients with serum creatinine >1.5, history of renal disease, DM>10 years, HTN>10 years, UA> trace protein.
- ⇨ Urine Sodium: in patients with abnormal BUN/creatinine, abnormal creatinine clearance, abnormal urinalysis or ascites.

For Female Patients only:

- ⇨ Pap smear - over 18
- ⇨ Mammogram - over 40