LIVER TRANSPLANTATION
WHAT SHOULD YOU KNOW

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Who are the Candidates for Liver Transplant?

- The prospective candidates for liver transplants include those diagnosed with any of the following liver diseases.
- Acute hepatic necrosis
- Liver cirrhosis
- Portal hypertension
- Hepatitis C with cirrhosis
- Alcoholic liver disease
- Hepatitis B with cirrhosis
- Liver cancer
- NAFLD (Fatty Liver Disease)
- Metabolic diseases
  - A1 Antitrypsin deficiency, hemochromotosis, Wilson’s disease, FAP etc.
- Biliary atresia (75% -80% of pediatric recipients)
- Primary sclerosing cholangitis
- Primary Biliary cirrhosis
- HIV
- Polycystic liver disease
Contraindications to Liver Transplantation

While each patient is evaluated on an individual basis, the presence of one or more of the following will frequently preclude acceptance as a candidate for liver transplantation:

- HIV infection with wasting, detectable viral load, CD4 below 200, drug resistant
- Active alcohol or substance abuse
- Systemic infections
- Life limiting co-existing medical conditions:
  - advanced cardiovascular
  - lung
  - neurologic conditions
- Uncontrolled psychiatric disorder
- Inability to comply with pre- and post-transplant regimen
Essential Steps

Evaluation

Selection Committee

Approval
Need more tests
Denial
Essential Steps

Approval

Listing – waiting list (deceased donors)

Evaluation of living donors

- Compatible blood type
- Size match
Donors

Deceased donors:

Brain death
- the brain function is completely lost
- the other organs in the body are still functioning

Donation after cardiac death:
- the heart has stopped
- after a short time the organs are retrieved

Living donors:
Healthy family members or friends wishing to donate part of their liver for you
Liver transplant waiting list

Status 1 – acute disease, risk of immediate death without a liver transplant

Everybody else: MELD score

Ingredients: bilirubin, creatinine, INR

Sicker patients go first
Patients with certain diseases with high risk of death waiting on the list:
higher MELD scores given

Highest: 40
Lowest: 6

Sick person, dying in ICU
Good liver function
Lab Test Frequency

- MELD score greater than or equal to 25
  - Labs needed every 7 days
- MELD score 24-19
  - Labs needed every 30 days
- MELD score 18-11
  - Labs needed every 90 days
- MELD score less than or equal to 10
  - Labs needed every year
Special case exceptions

There are four Special Case Exceptions that will be assigned a higher MELD score than that assigned by the patient’s laboratory test results:

• Hepatocellular Carcinoma (Liver Cancer)

• Hepatopulmonary Syndrome (Abnormal changes within the lung which results from the high pressure within the liver. Results in severe shortness of breath because of the extremely low level of oxygen. Patient usually needs oxygen therapy)

• Familial Amyloidosis (Rare, chronic disease resulting in accumulation of an abnormal fibrillar scleroprotein (amyloid), which infiltrates body organs and can cause life threatening organ damage.)

• Primary Oxaluria (Metabolic disorder seen in pediatric patients only)
Surgery

5 to 6 hours to complete (PLUS anesthesia)
Liver Transplantation

• Adult Liver Transplant from a Deceased Donor
• Adult to Adult Living Donor Liver Transplant: Donor Procedure
• Adult to Adult Living Donor Liver Transplant: Recipient Procedure
• In-Situ Splitting of the Cadaveric Donor Liver (Conventional Technique)
• Ex-Vivo splitting of the cadaveric donor liver
• Split Liver Transplant for 2 Adult Recipients
Hospital Stay

First day of surgery: intensive care unit (1-2 days)

Hospital stay is 6-14 days, including 1-2 day in the ICU, if there are no complications.

Patients have a different pace of recovery.

Clinic follow-up for 3 months post-transplant.

Annual follow-up for all
most important for Hep C+
to assess long-term renal function (dysfunction)
Complications

Surgical:

Death in the operating room
Bleeding, heart failure, air embolus

Primary non-function (liver not functioning) ~ 2%
Solution: urgent second transplant

Vascular complications (clot in artery or vein) ~ 1.6 – 4%
Typically needs surgery to bring the blood flow into the liver
If not possible: urgent second transplant
Complications

Surgical:

Bleeding after surgery
\~10 \% return to the operating room to evacuate blood and clots
No impact on the liver or the patient

Bile duct problems \~ 10 \%
Some treated in Radiology
Some need another operation
Immunosuppression

Always needed after a transplant, to prevent rejection

More in the beginning, lower need for medications later, it CAN NEVER STOP

Each patient has a different dosage depending on:

- liver function
- time after transplant
- other medications, other conditions

Important: take the medication EXACTLY as ordered
Immunosuppression

- Calcineurin inhibitors
  - Tacrolimus
  - Neoral
- Cell cycle inhibitors
  - Mycophenolate
- mTor inhibitors
- Steroids
- Induction agents
  - Monoclonal antibodies
    - OKT3
    - Campath
    - Rituxin
  - Polyclonal antibodies
    - Thymoglobulin
Rejection

Happens mostly often early after a transplant (first 12 weeks) ~ 20 % of patients

There are no symptoms early

Diagnosis is based on :

- laboratory tests = NOT normal
- liver biopsy (mandatory)

Important : keep the appointments for scheduled laboratory testing

Rejection can be treated and it disappears if diagnosed in time
Immunosuppression: side effects

- diabetes
- hypertension
- renal dysfunction (up to 30% end up with renal failure)
- infections
  - Viruses, bacteria, yeast, protozoa, fungal
- GVHD = death

- cancer
  *Skin
  - HCC (recurrent disease)
  - Lung (NO SMOKING!)
  - Lymphoma ~ 2% of all liver transplant recipients
    - higher incidence in the pediatric population
Both the survival AND the quality of life are better with a liver transplant than with the original liver if:

1. The patient is FIT to undergo transplantation
2. The liver disease is severe enough (MELD higher than 15)

Why evaluate when the liver disease is not so serious?
- It is easier to do the evaluation when the patient is not very sick
- We often find other important problems needing treatment
- Some very sick patients cannot go through the evaluation in time and die before they can get a transplant
Patient and graft survival – general US data

Patient survival
Graft survival

%  

0 12 24 36 48 60 Months

0 100 90 80 70 60 50 40 30 20 10 0 %

1 3 5 Years

Months

Patient survival
Graft survival
The MELD Model, UNOS Modification
In the following model, survival probability of a patient with end-stage liver disease is estimated based on the following variables. Please enter data in the corresponding boxes.

What is the INR?

What is the bilirubin? (mg/dl)

What is the creatinine? (mg/dl)

Has the patient had dialysis at least twice in the past week?

No

Yes