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LIVER TRANSPLANTATION

The liver is the largest and one of the most complex internal organs. It manages hundreds of details to ensure the cells in your body are nourished and safe.

Your liver's work includes producing bile, a substance that breaks down fats in your small intestine; parceling out and storing sugars, fats, vitamins and other nutrients; filtering waste products, harmful substances and some infectious agents from your bloodstream; and producing several important proteins, including proteins that enable your blood to clot when you have a cut.

Your liver is incredibly resilient. It's normally very good at repairing and replacing its own cells when they're damaged. But if you have advanced liver disease and if other treatment options can't improve a failing liver or prevent further damage, your doctor may recommend a liver transplant.

Before making a decision about liver transplantation, know what to expect of the organ transplant process, the surgery itself, potential risks and follow-up care.

When is transplantation needed?

A transplant may be recommended for sudden liver failure caused by toxins or severe infection, but it's more often a final treatment option for long-term, progressive liver damage. Cirrhosis refers to irreversible damage to the liver that occurs when scar tissue replaces healthy cells and prevents normal liver function. Conditions that may cause cirrhosis and the need for a transplant include:

- Chronic hepatitis B and C
- Diseases of the bile ducts
- Alcoholic liver disease
- Autoimmune liver diseases
- Buildup of fat in the liver

In children, the conditions that most often cause liver failure and may be treated with a transplant are:

- Defects in the liver or bile ducts present at birth

- Metabolic disorders
- Liver cancer
- Sudden liver failure from drugs

The transplant journey: Taking the first steps

If your doctor recommends a liver transplant, he or she will likely refer you to a transplant center for an evaluation. You also are free to select a transplant center on your own. Discuss with your health insurance provider which transplant centers are covered under your insurance plan.

When selecting a transplant center, take into account the number of liver transplants the center performs each year and the recipient survival rates. You can compare transplant center statistics through a database maintained by the Scientific Registry of Transplant Recipients.

You should also consider additional services provided by a transplant center. Many centers coordinate support groups, assist you with travel arrangements, help you find local housing for your recovery period, or direct you to organizations that can help with these concerns.

Once you select a transplant center, you'll need to undergo an evaluation to determine whether you meet the transplant center's eligibility requirements. The evaluation will assess whether you:

- Have a medical condition that would benefit from transplantation
- Aren't likely to benefit from other treatment options
- Are healthy enough to undergo surgery and post-transplant treatments
- Are willing and able to take medications as directed
- Have sufficient emotional stamina to undergo the wait for a donor organ and have a supportive network of family and friends to help you during this stressful time

If liver failure is the result of alcohol or drug abuse, you also will be evaluated to determine whether you currently abstain from use, have received adequate chemical dependency treatment and are at risk of using alcohol or drugs after the transplant.

Waiting for a donor organ

If the transplant center determines that you're a good candidate for a liver transplant, the center will register you on a nationwide waiting list. When a donor organ becomes available, the donor-recipient matching system, administered by UNOS, the United Network for Organ Sharing, makes an appropriate match. Factors taken into consideration during the matching process are:

- Blood type (A, B, AB or O)

- Size of the donor organ
- Medical urgency of the potential recipients

Your medical team will assign you a score that represents how urgently you need a transplant in order to survive. For adults 18 years of age and older, the score is a number between 6 and 40 on a scale called the Model for End-Stage Liver Disease, or MELD, Scoring System. The higher the number, the more urgent the need for a transplant.

The score is calculated from the results of blood tests that indicate how well:

- Your liver excretes bile.
- Your liver produces blood-clotting factors.
- Your kidneys are functioning. Severe liver disease often impairs kidney function.

Your MELD score may go up or down while you wait for a transplant. Your medical team will evaluate your status frequently and update your score as necessary.

The Pediatric End-Stage Liver Disease, or PELD, Scoring System, is a similar 6- to 40-point scale for transplant candidates under the age of 18. A PELD score reflects:

- How well the liver excretes bile
- How well the liver produces blood-clotting factors
- How well the liver maintains adequate nutrition
- Whether the child fails to grow
- Whether the child is less than 1 year old

An extremely urgent case, or status 1 liver failure, supersedes the MELD and PELD scores. These individuals have sudden or nearly complete liver failure and have a life expectancy of less than seven days.

Preparing for the transplant

A liver transplant from a deceased donor needs to occur within 12 to 24 hours after the liver is removed from the donor if the organ is to remain viable. Because of this time restraint, the donor-recipient matching system considers distance between the donor hospital and potential recipients. MELD and PELD scores do, however, influence this allocation. For example, an organ would be offered to a person with status 1 liver failure outside of a local area of the donor hospital before being offered locally to someone with a MELD score of 40.

If the matching system has ranked you as the best recipient for an organ, you and your transplant team have a limited time to consider whether to accept the donation. The transplant center will most likely provide you with a pager or cell phone to notify you when a potential donor organ is available. You must keep your phone charged at all times and should change pager batteries monthly.

As much as possible, you and your family should make travel plans ahead of time. Some transplant centers provide assistance with air transportation or other travel arrangements. Have a suitcase packed with everything you'll need for your hospital stay, as well as an extra 24-hour supply of your medications.

When you arrive at the hospital, a team will prepare you for surgery. The surgeon will also do a final assessment of the donor liver to ensure it's healthy and a good match.

Split-liver and living-donor liver transplants

The need for livers far outpaces the number of donations. As of November 2004, more than 17,000 people were waiting to receive a liver transplant. In all of 2003, however, there were only enough donor organs to provide 5,671 transplants.

One strategy to address the limited supply is to split a large and healthy liver from a deceased donor into two parts. Usually, an adult receives the right lobe (about 60 percent of the liver) and a child or adolescent receives the left lobe (about 40 percent). An even smaller portion may be used for an infant. Because of the liver's ability to regenerate itself, these partial organs will increase in size.

Living-donor transplants are also becoming more common at some transplant centers. In 2003, 321 transplanted livers were from living donors. A living donor can donate part of his or her liver to a recipient, the right lobe to an adult or left lobe to a child or adolescent.

In addition to alleviating the shortage of donor organs, the living-donor procedure may have other advantages:

- It's easier to evaluate the health of the donor and donor organ.
- Surgery can be scheduled in advance at an optimal time for the donor and recipient, rather than being scheduled without advance notice upon the death of a donor.

The remaining portion of the donor's healthy liver regenerates itself to full size within a few weeks. Donors have a 25 percent chance of some type of complication, such as an infection, bleeding or abnormal liver function, but most of these problems eventually go away without long-term effects. There is also a very slight risk of death to the donor. To reduce the risk of complications, donors are carefully screened to assess their general health, liver health and risk of liver disease.

The surgery

A liver transplant often takes six to eight hours, but the time can vary significantly. The diseased liver is removed through an incision in your upper abdomen. The donor liver is placed inside your abdomen, and blood vessels from your body are attached to those of

the new liver. The bile duct of the donor liver is attached to your bile duct or to a segment of intestine so that bile can drain into your small intestine.

After the surgery, you'll have some pain, which will be treated with medications. Recovery often involves a five- to 10-day hospital stay, depending on how well you and your new liver are doing. You'll also undergo frequent assessments during the following two to four weeks and will be expected to have living accommodations within a relatively short commute of the transplant center.

After the surgery

Key to understanding post-transplant treatment is the concept that a transplanted organ is foreign tissue to your body. Your immune system will attack a new liver just as it would a viral infection.

Your new drug regimen after the transplant will include immunosuppressants — medications that suppress the activity of your immune system, so that it won't attack your transplanted liver. Because your immune system will most likely never get used to the new organ, you will take some of these medications for the rest of your life.

These drugs may cause noticeable side effects. With some post-transplant medications, your face may become round and full, and you may gain weight, develop acne or facial hair, or experience stomach problems. Some of the effects are more pronounced when you first start the drug regimen but decrease in severity later on.

Because immunosuppressants make your body more vulnerable to infection, your doctor may also prescribe antibacterial, antiviral and antifungal medications. Some immunosuppressants can also raise your risk of developing certain conditions or complicating others you may already have, such as:

- High blood pressure
- Diabetes
- High cholesterol
- Cancer

Your post-transplant treatment, therefore, will be a delicate balancing act focusing on preventing rejection, managing unwanted side effects and maintaining enough disease-fighting power to ward off infection. Your doctor will monitor your treatment closely and adjust it as necessary.

Along with taking medication, you'll also be expected to follow a diet and exercise routine designed to keep your new liver healthy.

What can you expect of your new liver?

The majority of people who receive a liver transplant enjoy a high quality of life. The organ survival rate within the first year is about 80 percent with living-donor and deceased-donor livers. The organ survival rate at five years is about 78 percent and 64 percent, respectively.

What if your new liver fails?

Some transplanted livers lose their ability to function. Your new liver may fail because of organ rejection, because the underlying causes of liver disease damaged the new organ, or because of other factors that couldn't be controlled.

If this happens, you can be considered for a second transplant, or you may choose to discontinue treatment. These decisions will depend on your current health and ability to undergo surgery. Discussions with your transplant team, physician and family should address your expectations and preferences for treatment, emergency care and end-of-life care.