Liver Transplantation, What I need to know

WHAT DOES MY LIVER DO?

The liver performs a wide range of functions. The liver helps fight infections and make proteins. It cleans the blood by removing harmful toxins. The liver also helps digest food and stores energy for when you need it.

WHAT ARE THE SIGNS OF LIVER PROBLEMS?

Some signs of liver problems are:

- Feeling tired or weak.
- Losing your appetite.
- Feeling sick to your stomach.
- Losing weight.
- Bruising or bleeding easily, such as nosebleeds.
- Bloating due to fluid buildup in the abdomen (*ascites*).
- Declining mental functions.

Liver problems often make the skin and the whites of the eyes turn yellow. This is a condition called jaundice. Liver problems may also cause swelling in the legs and the abdomen.

You cannot live without a liver that works. If your liver fails, your caregiver may put you on a waiting list for a liver transplant.

WHAT IS LIVER TRANSPLANTATION?

Liver transplantation is surgery to remove a diseased liver and replace it with a healthy one. This kind of surgery has been done with a high level of success since the mid-1980's. Many people have had liver transplants and now lead normal lives.

WHAT ARE THE REASONS FOR NEEDING A LIVER TRANSPLANT?

Liver transplants can help adults and children.

In adults, the most common reason for liver transplantation is cirrhosis. Cirrhosis is caused by many different types of liver injuries that destroy healthy liver cells and replace them with scar tissue. Cirrhosis can be caused by viruses such as hepatitis B and C, alcohol, autoimmune diseases, liver diseases, buildup of fat in the liver, and hereditary liver diseases. Other reasons for transplantation are liver cancer, and overdoses of drugs like acetaminophen. Sometimes the cause of liver failure is not known.

In children, the most common reason for liver transplantation is biliary atresia. Bile ducts, which are tubes that carry bile out of the liver, are missing or damaged in this disease. This obstructed bile causes cirrhosis. The body uses bile to help digest food.

HOW WILL I KNOW WHETHER I NEED A LIVER TRANSPLANT?

Your caregiver will decide whether you need to go to a hospital that does liver transplants. You will meet the liver transplant team. The team is usually led by a liver transplant surgeon and includes liver specialists (*hepatologists*), nurses, and other health care professionals. The transplant team will arrange blood tests, x rays, and other tests to help make the decision about whether you need a transplant and whether a transplant can be carried out safely.

Other aspects of your health--like your heart, lungs, kidneys, immune system, and mental health--will also be checked to be sure you are strong enough for surgery.

CAN ANYONE WITH LIVER PROBLEMS GET A TRANSPLANT?

You cannot have a transplant if you have:

- Cancer in another part of your body.

- Serious heart, lung, or nerve disease.
- Active alcohol or illegal drug abuse.
- An active, severe infection.
- Inability to follow your caregiver's instructions.

HOW LONG DOES IT TAKE TO GET A NEW LIVER?

If you need a transplant, your name will be placed on a national waiting list kept at the United Network for Organ Sharing (UNOS). Your blood type, body size, and how sick you are all play a role in when you will receive a liver. The sickest people are at the top of the list. You may have to wait a long time.

While you wait for a new liver, you and your caregiver should talk about what you can do to stay strong for the surgery. You will also start learning about taking care of a new liver.

For information about the national waiting list and patient rankings, please contact UNOS.

WHERE DO THE LIVERS FOR TRANSPLANTS COME FROM?

Whole livers come from people who have just died. This type of donor is called a cadaveric donor. Sometimes a healthy person will donate part of his or her liver for a particular patient. This kind of donor is called a living donor.

All living donors and donated livers are tested before transplant surgery. The testing makes sure the liver is healthy, matches your blood type, and is the right size so it has the best chance of working in your body.

HEALTH INSURANCE

You should check your health insurance policy to be sure it covers liver transplantation and prescription medicines. You will need many prescription medicines after the surgery and for the rest of your life.

WHAT HAPPENS IN THE HOSPITAL?

When a liver is available, you will be prepared for the surgery. If your new liver is from a living donor, both you and the donor will be in surgery at the same time. If your new liver is from a person who has recently died, your surgery starts when the new liver arrives at the hospital.

DURING SURGERY

The surgery can take from 4 to 14 hours. While the surgeon removes your diseased liver, other doctors prepare the new liver.

The surgeon will disconnect your diseased liver from your bile ducts and blood vessels before removing it. The blood that flows into your liver will be blocked or sent through a machine to return to the rest of your body. The surgeon will put the healthy liver in place and reconnect it to your bile ducts and blood vessels. Your blood will then flow into your new liver.

AFTER SURGERY

You will stay in the hospital for an average of 1 to 3 weeks to be sure your new liver is working. You will take medicines to prevent rejection of your new liver and to prevent infections. Your caregiver will check for bleeding, infections, and rejection. During this time you will start to learn how to take care of yourself and use your medicines to protect your new liver after you go home.

In the hospital, you will slowly start eating again. You will start with clear liquids, then switch to solid food as your new liver starts to work.

WHAT IS REJECTION?

Rejection occurs when your body's natural defenses, called the immune system, damage the new liver. Your immune system keeps you healthy by fighting against things that do not belong in your body, such as bacteria and viruses. After a transplant, it is common for your immune system to fight against the liver and try to destroy it.

HOW IS REJECTION PREVENTED?

To keep your body from rejecting the new liver, you will take medicines. These drugs, such as steroids, cyclosporine, tacrolimus, sirolimus, and mycophenolate mofetil, are called immunosuppressants. Immunosuppressants weaken your immune system's ability to reject your new liver.

DO IMMUNOSUPPRESSANTS HAVE ANY SIDE EFFECTS?

Yes. You can get infections more easily. This is because these drugs weaken your immune system. You will need to stay away from people who are sick. These drugs may also increase your blood pressure, cause your cholesterol to rise, cause diabetes, weaken your bones, and damage your kidneys. Steroid drugs may also cause changes in how you look by causing weight gain. Your caregiver and the transplant team will monitor these effects and may treat you for complications.

WHAT ARE THE SIGNS OF REJECTION?

Caregivers will check your blood for liver enzymes. This is the first sign of rejection. Often rejection does not make you feel ill. Sometimes rejection can cause:

- Nausea.
- Fever.
- Pain.
- Jaundice.

A liver biopsy is often needed to be sure that the transplanted liver is being rejected. For a biopsy, a doctor takes a small piece of the liver to view under a microscope.

WHAT ARE THE OTHER PROBLEMS THAT CAN DAMAGE THE LIVER TRANSPLANT?

Return of the problem that made the transplant necessary in the first place is the most common problem for patients with liver transplants. Also, hepatitis C virus may damage a transplant if the patient was infected before the operation took place.

Other problems include:

- Blockage of the blood vessels going into or out of the liver.
- Damage to the tubes that carry bile into the intestine.

WHAT IF THE TRANSPLANT DOES NOT WORK?

Liver transplants usually work. About 80 to 90 percent of transplanted livers are still working after 1 year. If the new liver does not work or if your body rejects it, your caregiver and the transplant team will decide whether another transplant is possible.

HOW DO I TAKE CARE OF MY LIVER AFTER I LEAVE THE HOSPITAL?

After you leave the transplant center at the hospital, you will see your caregiver often to be sure your new liver is working well. You will have regular blood tests to check that your new liver is not being damaged by rejection, infections, or problems with blood vessels or bile ducts. You will need to avoid sick people and report any illnesses to your caregiver. You will need to eat a healthy diet and exercise. Do not drink alcohol, especially if alcohol was the cause of damage to your own liver. Only use medicines, including ones you can buy without a prescription, if your caregiver says they are safe for you. It is important to do what your caregiver says to take care of your new liver.

Eating a healthy diet and taking the medications are part of taking care of your new liver.

CAN I GO BACK TO MY DAILY ACTIVITIES?

Yes. After a successful liver transplant, most people can go back to their normal daily activities. Getting your strength back will take some time. This can depend on how sick you were before the transplant. You will need to check with your caregiver on how long your recovery period should be. Social workers and support groups will help you adjust to life with a new liver.

Work. Most people are able to go back to work after recovery.

Diet. Most people can go back to eating as they did before. Some medicines may cause you to gain weight. Others may cause diabetes or a rise in your cholesterol. Meal planning and a balanced low-fat diet can help you

remain healthy.
Exercise. Most people can engage in physical activity after a successful liver transplant.
Sex. Most people return to a normal sex life after liver transplantation. It is important for women to avoid becoming pregnant in the first year after transplantation. Talk to your transplant team about sex and reproduction after transplantation.
If you have any questions, check with your caregiver before starting any activity.

GLOSSARY

- Ascites (uh-SY-teez): A buildup of fluid in the abdomen.
- Autoimmune (AW-toh-im-YOON): A term that refers to a person's immune system attacking his or her own body.
- Biliary atresia (BILL-ee-air-ee uh-TREEZ-ya): A condition that results when the bile ducts inside or outside the liver do not have normal openings. Bile becomes trapped in the liver, causing jaundice and cirrhosis. This condition is present from birth and without surgery may cause death.
- Biopsy (BYE-op-see): Removing a small piece of tissue to view under a microscope.
- Cirrhosis (sir-ROH-sis): A chronic liver condition caused by scar tissue and damage to cells. Cirrhosis makes it hard for the liver to remove poisons (toxins) like alcohol and drugs from the blood. These toxins build up in the blood and may affect the brain.
- Cyclosporine (sy-klo-SPOR-in): An immunosuppressant used after transplantation to prevent rejection.
- Immunosuppressants (im-you-no-suh-PRESS-unts): Medicines that stop your immune system from attacking bacteria, viruses, and transplanted organs.
- Jaundice (JAWN-dus): A symptom of many disorders. Jaundice causes the skin and the whites of the eyes to turn yellow.
- Mycophenolate mofetil (MY-co-PHEN-olate MOF-i-til): An immunosuppressant used after transplantation to prevent rejection.
- Sirolimus (si-RAW-lih-mus): An immunosuppressant used after transplantation to prevent rejection.
- Steroids (STAIR-oids): A group of immunosuppressants used after transplantation to prevent rejection.
- Tacrolimus (ta-CRAW-lih-mus): An immunosuppressant used after transplantation to prevent rejection.

WEBLINK

Liver transplantation: http://jama.ama-assn.org/cgi/content/full/295/18/2208

FOR MORE INFORMATION

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The National Digestive Diseases Information Clearinghouse (NDDIC) is a service of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). The NIDDK is part of the National Institutes of Health under the U.S. Department of Health and Human Services. Established in 1980, the clearinghouse provides information about digestive diseases to people with digestive disorders and to their families, health care professionals, and the public. NDDIC answers inquiries, develops and distributes publications, and works closely with professional and patient organizations and Government agencies to coordinate resources about digestive diseases.
Publications produced by the clearinghouse are carefully reviewed by both NIDDK scientists and outside experts.

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The NDDIC is a service of the National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health
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