

Your Liver, A Vital Organ

Your liver, the largest organ in your body, plays a vital role in regulating life processes. This complex organ performs many functions essential to life. You simply cannot live without it.

The location of the liver

The liver, located behind the lower ribs on the right side of your abdomen (see diagram), weighs about 3 pounds and is roughly the size of a football.

Functions of your liver

This vital organ performs many complex functions. Some of these are:

1. To convert food into chemicals necessary for life and growth;
2. To manufacture and export important substances used by the rest of the body;
3. To process drugs absorbed from the digestive tract into forms that are easier for the body to use; and
4. To detoxify and excrete substances that otherwise would be poisonous.

Your liver plays a key role in converting food into essential chemicals of life. All of the blood that leaves the stomach and intestines must pass through the liver before reaching the rest of the body. The liver is thus strategically placed to process nutrients and drugs absorbed from the digestive tract into forms that are easier for the rest of the body to use. In essence, the liver can be thought of as the body's refinery.

Furthermore, your liver plays a principal role in removing from the blood ingested and internally produced toxic substances. The liver converts them to substances that can be easily eliminated from the body. It also makes bile, a greenish-brown fluid that is essential for digestion. Bile is stored in the gallbladder which, after eating, contracts and discharges bile into the intestine, where it aids digestion.

The liver also chemically modifies many drugs taken to treat diseases. These changes govern the drug's activity in the body.

Your liver helps you by:

- Producing quick energy when it is needed;
- Manufacturing new body proteins;
- Preventing shortages in body fuel by storing certain vitamins, minerals, and sugars;
- Regulating transport of fat stores;
- Regulating blood clotting;
- Aiding in the digestive process by producing bile;

- Controlling the production and excretion of cholesterol;
- Neutralizing and destroying poisonous substances;
- Metabolizing alcohol;
- Monitoring and maintaining the proper level of many chemicals and drugs in the blood;
- Cleansing the blood and discharging waste products into the bile;
- Maintaining hormone balance;
- Serving as the main organ of blood formation before birth;
- Helping the body resist infection by producing immune factors and by removing bacteria from the bloodstream;
- Regenerating its own damaged tissue; and
- Storing iron.

Liver diseases

There are many types of liver diseases, but among the most important are:

- Viral hepatitis
- Cirrhosis
- Liver disorders in children
- Gallstones
- Alcohol related liver disorders
- Cancer of the liver

Symptoms and signs of liver disease

1. **ABNORMALLY YELLOW DISCOLORATION OF THE SKIN AND EYES.** This is called jaundice, often the first and sometimes the only sign of liver disease.
2. **DARK URINE.**
3. **GRAY, YELLOW, OR LIGHT-COLORED STOOLS.**
4. **NAUSEA, VOMITING AND/OR LOSS OF APPETITE.**
5. **VOMITING OF BLOOD, BLOODY OR BLACK STOOLS.** Intestinal bleeding can occur when liver diseases obstruct blood flow through the liver. The bleeding may result in vomiting of blood or bloody stools.
6. **ABDOMINAL SWELLING.** Liver disease may cause ascites, an accumulation of fluid in the abdominal cavity.
7. **PROLONGED GENERALIZED ITCHING.**

8. UNUSUAL CHANGE OF WEIGHT. An increase or decrease of more than 5% within two months.
9. ABDOMINAL PAIN.
10. SLEEP DISTURBANCES, MENTAL CONFUSION AND COMA are present in severe liver disease. These result from an accumulation of toxic substances in the body, which impair brain function.
11. FATIGUE OR LOSS OF STAMINA.
12. LOSS OF SEXUAL DRIVE OR PERFORMANCE.

If any of these signs or symptoms appear, consult your physician immediately.

Prevention

- Don't drink.
- Be cautious about mixing several drugs; in particular, alcohol and many "over-the-counter" and prescription medicines do not mix well.
- Avoid taking medicines unnecessarily. Also avoid exposure to industrial chemicals whenever possible.
- Maintain a healthful, balanced diet.
- Consult your physician if you observe any signs or symptoms of liver disease.

Gallstones

Gallstones are formed when the cholesterol and/or pigment in bile crystallize in the gallbladder forming stones that vary in size from small pebbles to as large as golf balls. Sometimes gallstones get stuck in the bile ducts leading from the gallbladder to the duodenum (i.e., the first part of the small intestine). The gallbladder and bile ducts then try to push the stones out by muscular contractions. This can cause attacks of excruciating abdominal pain. Blockage of the ducts by stones also prevents flow of bile into the intestines. Bile then backs up into the bloodstream, causing jaundice.

Gallstones are more common in people over 40, especially in women and the obese.

Each year, 400-500,000 surgical operations to remove the gallbladder are performed in the United States.

Drugs are now available to dissolve cholesterol gallstones in selected patients and give hope for fewer surgeries in the future.

Viral hepatitis

Several different viruses cause hepatitis (meaning an inflammation of the liver). Hepatitis A is spread through contaminated water and food and is excreted in the stools. Hepatitis B is acquired from transfusions or other blood products. It can be transmitted through

minute cuts or abrasions or by such simple acts as kissing, tooth brushing, ear piercing, tattooing, having dental work or during sexual contact. It can be transmitted from a pregnant woman to her baby. Hepatitis C, formerly called non-A, non-B hepatitis, is primarily spread through infected blood. It causes cirrhosis in 50% of the cases.

The liver often becomes tender and enlarged, and the patient usually exhibits symptoms including fever, weakness, nausea, vomiting, jaundice and aversion to food. The virus may be present in the bloodstream, intestines, feces, saliva and other body secretions.

Hepatitis is common in the United States and some forms of it can be extremely infectious. Most people recover from viral forms of the disease without treatment, but some die and others may develop a chronic, disabling illness.

In the United States there are more than four million "carriers" of hepatitis, people who are not ill, but may pass hepatitis on to others.

A vaccine for hepatitis B has been shown to be safe and effective in the prevention of infection if given before exposure. It is recommended for all infants, those who come into contact with blood in their work and for anyone with more than one sex partner is. Treatments with interferon are effective in some cases of hepatitis B and C.

A vaccine for hepatitis A was recently approved. It is effective in protecting over 90% of those who are vaccinated for at least six to 12 months and perhaps longer.

Alcohol-related liver disorders

There are three separate liver disorders related to alcohol: fatty liver, alcoholic hepatitis, and alcoholic cirrhosis.

Fatty liver, the most common alcohol-related liver disorder, causes enlargement of the liver and right upper abdominal discomfort. The swollen liver is often tender or painful. Severe fatty liver may cause temporary jaundice and abnormalities of liver function. Abstinence from alcohol can effect complete reversal and cure without leaving residual cirrhosis.

Alcoholic hepatitis is an acute illness often characterized by nausea, vomiting, right upper and middle abdominal pain, fever, jaundice, enlarged and tender liver, and an elevation of the white blood cell count. Sometimes alcoholic hepatitis may be present without symptoms. As with fatty liver, treatment is primarily supportive and preventive.

Any disease, which is brought on by alcohol abuse, cannot be reversed until alcohol intake is stopped. Once alcoholic hepatitis develops, progression to cirrhosis will occur if alcohol consumption continues.

Alcoholic cirrhosis occurs in 10% to 15% of people who consume large amounts of alcohol over a prolonged period of time. However, there is considerable variation in the degree of susceptibility of people to given amounts of alcohol, and further research is needed to determine why some individuals are more vulnerable to alcohol than others.

Cirrhosis

Each year over 25,000 Americans die from cirrhosis, the seventh leading cause of death in the United States. In fact, between the ages of 25 and 44, it is the fourth disease-related cause of death.

Cirrhosis of the liver is a degenerative disease where liver cells are damaged and replaced by scar formation. As scar tissue progressively accumulates, blood flow through the liver is diminished, causing even more liver cells to die. Loss of liver function results in gastrointestinal disturbances, emaciation, enlargement of the liver and spleen, jaundice, accumulation of fluid in the abdomen and other tissues of the body. Obstruction of the venous circulation often causes massive vomiting of blood.

Anything, which results in severe liver injury, can cause cirrhosis. Over alcohol abuse, hepatitis and other viruses cause half of the deaths from cirrhosis of the liver. Some chemicals, many poisons, too much iron or copper, severe reaction to drugs, and obstruction of the bile duct can also cause cirrhosis.

Some types of cirrhosis can be treated, but often there is no cure. At this point, treatment is mostly supportive and may include a strict diet, diuretics, vitamins, and abstinence from alcohol. However, there has been much progress in managing the major complications of cirrhosis such as fluid retention in the abdomen, bleeding, and changes in mental function.

Liver disorders in children

Tens of thousands of American children--from newborn infants to adolescents--get liver diseases, and hundreds die from them every year. There are more than 100 different types of liver diseases that have been identified in infants and children.

The more common of these diseases are:

BILIARY ATRESIA--the absence or inadequate size of bile ducts from the liver to the intestine. Unable to excrete bile, the infant usually dies from cirrhosis and bleeding by 2 years of age. A surgical operation may relieve obstruction in a small percentage of cases.

CHRONIC ACTIVE HEPATITIS gradually destroys and replaces the normal liver cells with scar tissue through an unknown process which resembles an allergy to the child's own liver tissue.

GALACTOSEMIA is an inherited disease in which an enzyme needed to digest milk sugar is missing, causing the milk sugar to build up in the liver and other organs, leading to cirrhosis of the liver, cataracts of the eyes, and brain damage. Unless the baby is taken off milk and given an artificial formula that has no milk sugar, the child will die.

In **WILSON'S DISEASE**, large amounts of copper build up in the liver due to an inherited abnormality, causing cirrhosis of the liver and brain damage.

REYE'S SYNDROME is an acute, rare fatal disorder in which fat accumulates in the liver and the child goes into a deep coma.

CIRRHOSIS can be caused by any extensive injury to the liver including most of the disorders described above.

Cancer of the liver

The most common form of cancer of the liver is the spread of cancer from other organ systems to the liver.

Not much is known about cancer that originates in the liver except that it is associated with viral hepatitis and certain parasites, drugs, and environmental toxins. Each year, 1,000 Americans die of primary liver cancer. Chronic carriers of the hepatitis B or C viruses are at increased risk to develop liver cancer

Hope for tomorrow through research

Liver diseases appear to be on the increase. Part of this increase may be due to our frequent contact with chemicals and environmental pollutants. The amount of medicine consumed has increased greatly with resulting dangers to the liver.

The liver, the detoxifying factory in the body, has become an increasingly overworked organ.

The present investment in liver research is scant in relation to the magnitude, severity and destructiveness of these diseases.

Liver diseases are poorly understood. An adequate investment in effective liver research has the potential of saving billions of dollars and preventing untold human suffering.

Experts estimate that more than half of all liver diseases could be prevented if people acted upon the knowledge we already have.

Each year more than 25 million Americans are afflicted with liver and gallbladder diseases and more than 43,000 die of liver disease each year. There are few effective treatments for most life-threatening liver diseases, except for liver transplants. Research has recently opened up exciting new paths for investigation, but much more remains to be done to find cures for more than 100 different liver diseases.

Meanwhile, patients and their families must cope with medical, financial and emotional problems.

Source: The American Liver Foundation (ALF)