

# Cirrhosis of the Liver

*National Digestive Diseases Information Clearinghouse*



National  
Institute of  
Diabetes and  
Digestive  
and Kidney  
Diseases

NATIONAL  
INSTITUTES  
OF HEALTH

The liver, the largest organ in the body, is essential in keeping the body functioning properly. It removes or neutralizes poisons from the blood, produces immune agents to control infection, and removes germs and bacteria from the blood. It makes proteins that regulate blood clotting and produces bile to help absorb fats and fat-soluble vitamins. You cannot live without a functioning liver.

In cirrhosis of the liver, scar tissue replaces normal, healthy tissue, blocking the flow of blood through the organ and preventing it from working as it should. Cirrhosis is the eighth leading cause of death by disease, killing about 25,000 people each year. Also, the cost of cirrhosis in terms of human suffering, hospital costs, and lost productivity is high.

## **Causes**

Cirrhosis has many causes. In the United States, chronic alcoholism and hepatitis C are the most common causes.

*Alcoholic liver disease.* To many people, cirrhosis of the liver is synonymous with chronic alcoholism, but in fact, alcoholism is only one of the causes. Alcoholic cirrhosis usually develops after more than a decade of heavy drinking. The amount of alcohol that can injure the liver varies greatly from person to person. In women, as few as two to three drinks per day have been linked with cirrhosis and in men, as few as three to four drinks per day. Alcohol seems to injure the liver by blocking the normal metabolism of protein, fats, and carbohydrates.

*Chronic hepatitis C.* The hepatitis C virus ranks with alcohol as the major cause of chronic liver disease and cirrhosis in the United States. Infection with this virus causes inflammation of and low grade damage to the liver that over several decades can lead to cirrhosis.

*Chronic hepatitis B and D.* The hepatitis B virus is probably the most common cause of cirrhosis worldwide, but in the United States and Western world it is less common. Hepatitis B, like hepatitis C, causes liver inflammation and injury that over several decades can lead to cirrhosis. The hepatitis D virus is another virus that infects the liver, but only in people who already have hepatitis B.

*Autoimmune hepatitis.* This type of hepatitis is caused by a problem with the immune system.

*Inherited diseases.* Alpha-1 antitrypsin deficiency, hemochromatosis, Wilson's disease, galactosemia, and glycogen storage diseases are among the inherited diseases that interfere with the way the liver produces, processes, and stores enzymes, proteins, metals, and other substances the body needs to function properly.

*Nonalcoholic steatohepatitis (NASH).* In NASH, fat builds up in the liver and eventually causes scar tissue. This type of hepatitis appears to be associated with diabetes, protein malnutrition, obesity, coronary artery disease, and corticosteroid treatment.

*Blocked bile ducts.* When the ducts that carry bile out of the liver are blocked, bile backs up and damages liver tissue. In babies, blocked bile ducts are most commonly caused by biliary atresia, a disease in which the bile ducts are absent or injured. In adults, the most common cause is primary biliary cirrhosis, a disease in which the ducts become inflamed, blocked, and scarred. Secondary biliary cirrhosis can happen after gallbladder surgery, if the ducts are inadvertently tied off or injured.

*Drugs, toxins, and infections.* Severe reactions to prescription drugs, prolonged exposure to environmental toxins, the parasitic infection schistosomiasis, and repeated bouts of heart failure with liver congestion can each lead to cirrhosis.

## Symptoms

Many people with cirrhosis have no symptoms in the early stages of the disease. However, as scar tissue replaces healthy cells, liver function starts to fail and a person may experience the following symptoms:

- Exhaustion
- Fatigue
- Loss of appetite
- Nausea
- Weakness
- Weight loss.

As the disease progresses, complications may develop. In some people, these may be the first signs of the disease.

## Complications of Cirrhosis

Loss of liver function affects the body in many ways. Following are common problems, or complications, caused by cirrhosis.

*Edema and ascites.* When the liver loses its ability to make the protein albumin, water accumulates in the leg (edema) and abdomen (ascites).

*Bruising and bleeding.* When the liver slows or stops production of the proteins needed for blood clotting, a person will bruise or bleed easily.

*Jaundice.* Jaundice is a yellowing of the skin and eyes that occurs when the diseased liver does not absorb enough bilirubin.

*Itching.* Bile products deposited in the skin may cause intense itching.

*Gallstones.* If cirrhosis prevents bile from reaching the gallbladder, a person may develop gallstones.

*Toxins in the blood or brain.* A damaged liver cannot remove toxins from the blood, causing them to accumulate in the blood and eventually the brain. There, toxins can dull mental functioning and cause personality changes, coma, and even death. Signs of the buildup of toxins in the brain include neglect of personal appearance, unresponsiveness, forgetfulness, trouble concentrating, or changes in sleep habits.

*Sensitivity to medication.* Cirrhosis slows the liver's ability to filter medications from the blood. Because the liver does not remove drugs from the blood at the usual rate, they act longer than expected and build up in the body. This causes a person to be more sensitive to medications and their side effects.

*Portal hypertension.* Normally, blood from the intestines and spleen is carried to the liver through the portal vein. But cirrhosis slows the normal flow of blood through the portal vein, which increases the pressure inside it. This condition is called portal hypertension.

*Varices.* When blood flow through the portal vein slows, blood from the intestines and spleen backs up into blood vessels in the stomach and esophagus. These blood vessels may become enlarged because they are not meant to carry this much blood. The enlarged blood vessels, called varices, have thin walls and carry high pressure, and thus are more likely to burst. If they do burst, the result is a serious bleeding problem in the upper stomach or esophagus that requires immediate medical attention.

*Problems in other organs.* Cirrhosis can cause immune system dysfunction, leading to infection. Ascites (fluid) in the abdomen may become infected with bacteria normally present in the intestines, and cirrhosis can also lead to kidney dysfunction and failure.

## Diagnosis

The doctor may diagnose cirrhosis on the basis of symptoms, laboratory tests, the patient's medical history, and a physical examination. For example, during a physical examination, the doctor may notice that the liver feels harder or larger than usual and order blood tests that can show whether liver disease is present.

If looking at the liver is necessary to check for signs of disease, the doctor might order a computerized axial tomography (CAT) scan, ultrasound, or a scan of the liver using a radioisotope (a harmless radioactive substance that highlights the liver). Or the doctor might look at the liver using a laparoscope, an instrument inserted through the abdomen that relays pictures back to a computer screen.

A liver biopsy will confirm the diagnosis. For a biopsy, the doctor uses a needle to take a small sample of tissue from the liver, then examines it for scarring or other signs of disease.

## Treatment

Liver damage from cirrhosis cannot be reversed, but treatment can stop or delay further progression and reduce complications. Treatment depends on the cause of cirrhosis and any complications a person is experiencing. For example, cirrhosis caused by alcohol abuse is treated by abstaining from alcohol. Treatment for hepatitis-related cirrhosis involves medications used to treat the different types of hepatitis, such as interferon for viral hepatitis and corticosteroids for autoimmune hepatitis.

Cirrhosis caused by Wilson's disease, in which copper builds up in organs, is treated with medications to remove the copper. These are just a few examples—treatment for cirrhosis resulting from other diseases will depend on the underlying cause. In all cases, regardless of the cause, following a healthy diet and avoiding alcohol are essential because the body needs all the nutrients it can get, and alcohol will only lead to more liver damage.

Treatment will also include remedies for complications. For example, for ascites and edema, the doctor may recommend a low-sodium diet or the use of diuretics, which are drugs that remove fluid from the body. Antibiotics will be prescribed for infections, and various medications can help with itching. Protein causes toxins to form in the digestive tract, so eating less protein will help decrease the buildup of toxins in the blood and brain. The doctor may also prescribe laxatives to help absorb the toxins and remove them from the intestines.

For portal hypertension, the doctor may prescribe blood pressure medication such as a beta-blocker. If varices bleed, the doctor may either inject them with a clotting agent or perform a rubber-band ligation, which uses a special device to compress the varices and stop the bleeding.

When complications cannot be controlled or when the liver becomes so damaged from scarring that it completely stops functioning, a liver transplant is necessary. In liver transplantation surgery, a diseased liver is removed and replaced with a healthy one from an organ donor. About 80 to 90 percent of people survive liver transplantation. Survival rates have improved over the past several years because of drugs such as cyclosporine and tacrolimus, which suppress the immune system and keep it from attacking and damaging the new liver.

### For More Information

Information about cirrhosis is also available from

American Liver Foundation  
1425 Pompton Avenue  
Cedar Grove, NJ 07009  
Tel: (800) 465-4837 or (888) 443-7222  
Fax: (201) 256-3214  
Internet: [www.liverfoundation.org](http://www.liverfoundation.org)

Hepatitis Foundation International  
30 Sunrise Terrace  
Cedar Grove, NJ 07009-1423  
Tel: (800) 891-0707  
Fax: (973) 857-5044  
Internet: [www.hepfi.org](http://www.hepfi.org)

United Network for Organ Sharing (UNOS)  
P.O. Box 13770  
Richmond, VA 23225-8770  
Tel: 1-888-894-6361 or (804) 330-8500  
Internet: [www.unos.org](http://www.unos.org)

## National Digestive Diseases Information Clearinghouse

2 Information Way  
Bethesda, MD 20892-3570  
Tel: (301) 654-3810  
Fax: (301) 907-8906  
E-mail: [nddic@info.niddk.nih.gov](mailto:nddic@info.niddk.nih.gov)

The National Digestive Diseases Information Clearinghouse (NDDIC) is a service of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). 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, reviews, 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 for scientific accuracy, content, and readability.

This publication is not copyrighted. The clearinghouse encourages users of this fact sheet to duplicate and distribute as many copies as desired.

This publication is also available under "Health Information" at [www.niddk.nih.gov/](http://www.niddk.nih.gov/).



U.S. DEPARTMENT OF HEALTH  
AND HUMAN SERVICES  
National Institutes of Health

NIH Publication No. 00-1134  
January 2000