

Cirrhosis

The liver is an organ that has important functions in the body, including filtering toxins, making proteins and producing bile. Cirrhosis is a slow and progressive disease in which healthy liver tissue is replaced with scar tissue. See image below. Scar tissue forms because of injury or long-term (chronic) disease. Over time, the liver stops working properly and can also affect the way other organs function.

In the very early stage of cirrhosis, the liver might be swollen and enlarged. As the liver becomes more damaged and scar tissue replaces healthy liver tissue, the liver may become smaller than normal.



Healthy Liver

Cirrhosis

Causes

- Heavy alcohol use
- Chronic viral infections, especially with hepatitis types B and C
- Non-alcoholic fatty liver disease – This is often related to obesity, high cholesterol or type II diabetes
- Autoimmune disease affecting the liver
- Diseases that damage or destroy bile ducts (such as primary biliary cholangitis and primary sclerosing cholangitis)
- Certain drugs, medicines and chemicals
- Certain infections from parasites

Cirrhosis may also be caused by inherited diseases such as:

- Wilson disease – High levels of copper in the body
- Alpha-1 antitrypsin deficiency – Low levels of a protein in the blood
- Hereditary hemochromatosis – High levels of iron in the body
- Hepatic porphyria – Disorder that affects the skin, bone marrow and liver

Symptoms

Early Symptoms – In the early stages of cirrhosis, you may have few or no symptoms. Early stage symptoms can be non-specific and include:

- Weight loss
- Weakness
- Fatigue

Later Signs and Symptoms – As the cirrhosis gets worse, you may begin to notice certain physical signs or symptoms. Serious symptoms or problems that may occur in later stages of cirrhosis include:

- Jaundice – Yellowing of the skin or the white part of the eyes. Jaundice is caused by the build-up of bile pigment.
- Itching – Caused by the build-up of bile.
- Ascites – Fluid build-up in the abdomen (belly) that can cause distension. This may cause unexpected weight gain. The fluid can become infected. Some patients may have new abdominal pain and fever.
- Swelling of the legs, ankles and feet
- Easy bruising or bleeding – From the gum line or the nose
- Loss of muscle mass, particularly in the face, arms and legs
- Hepatic encephalopathy – This includes confusion, sleep disturbance, slurred speech and even coma. These problems are caused by a build-up of toxins affecting the brain because the liver cannot metabolize the toxins adequately. Some medical problems like underlying infection or gastrointestinal (GI) bleeding can also cause or worsen this condition.
- Esophageal varices – These are enlarged veins often found lining the esophagus and stomach. This is a common problem due to portal hypertension. Varices can rupture suddenly, which can result in life-threatening blood loss, with vomiting of blood (bright red or coffee-ground material) or blood in the stool causing the stool to look tarry black or maroon.
- Problems with other organs – This can include kidney problems such as acute kidney injury.
- Low sodium levels in the blood
- An increased risk for developing liver cancer
- Enlarged spleen – This is often found through imaging tests. This is often associated with low platelet counts.
- Increase or decrease in liver size – This is often found through imaging tests.
- Unusual redness in the palms of the hands
- Tiny spider-like vessels that may appear on the skin, particularly in the upper chest wall

Diagnosis

Keep in mind that the diagnosis of cirrhosis alone, in general, **does not** necessarily mean you are in liver failure. Patients with cirrhosis can live high-quality lives for many years, especially if the cirrhosis is diagnosed early.

To confirm the diagnosis of cirrhosis, your doctor **may** order a liver biopsy. A biopsy takes a small sample of liver tissue to study under a microscope.

A liver biopsy may not be needed if your doctor has enough information to support the diagnosis of cirrhosis, based on:

- Your symptoms and features on a physical exam, if present
- Blood tests results that can help determine how well the liver is working. These tests can also help detect if there is ongoing inflammation in the liver.
- Imaging by CT (computerized tomography) scan, MRI (magnetic resonance imaging) or ultrasound can show an abnormal appearance of the liver (liver might appear nodular). The scans may show signs of cirrhosis or signs of portal hypertension that are sometimes seen in patients with cirrhosis.
- Indirect fibrosis testing can be used to help determine the extent of liver scar tissue or fibrosis, such as through scoring systems, blood tests, or elastography. This is a special type of ultrasound test or MRI to estimate the degree of scar tissue in the liver.

Treatment of Cirrhosis

Treatment depends on the underlying cause and the level of liver damage. The goals of treatment are to prevent further liver damage and reduce the risk of developing complications of cirrhosis.

- The first step is to determine the cause or rule out other causes of cirrhosis. Your doctor may order multiple blood tests and possibly a liver biopsy to help determine the cause.
- Once a cause is suspected or found, your doctor will determine whether the underlying cause of cirrhosis requires specific treatment. For example, a person with cirrhosis who drinks too much alcohol will need to stop alcohol use. If you have chronic viral hepatitis B infection, your doctor will treat the hepatitis B infection. To treat different types of chronic liver disease, your doctor may prescribe medicine, if needed, and recommend lifestyle changes to reduce further damage to the liver.
- There is no medicine to reverse cirrhosis once it has developed. Your doctor will talk with you about how to possibly slow down the progression of cirrhosis and prevent potential complications of cirrhosis.

Treating Potential Complications and Symptoms

In very early cirrhosis, the complications of cirrhosis may not yet appear. However, as the years go by, one or all of these complications may develop.

- **Ascites** – Abnormal fluid in the belly. This can cause your belly to appear distended. A treatment or care plan may include:
 - Paracentesis – A procedure using a small needle and local anesthesia to remove fluid from the belly. The fluid can be tested for infection.
 - Low-sodium diet – This can help reduce the amount of fluid build-up. In most cases, a maximum of 2000 milligrams (or 2 grams) of sodium intake per day is recommended.
 - Diuretic medicines – These are often called fluid pills. They can help remove excess fluid from the belly and also reduce edema (swelling).
 - Electrolytes and creatinine (kidney function) levels will be monitored if diuretic medicines are prescribed.
 - You may be asked to record your weight each day to ensure that you are losing enough weight from excess fluid.

- **Hepatic encephalopathy** – A build-up of toxins in the brain. A treatment or a care plan may include:
 - Lactulose – This is a laxative that can help remove toxins from the body through bowel movements. Less toxins will help reduce confusion and help improve changes in cognition or wakefulness. Your doctor may tell you to take this medicine in a way to help you have 3 bowel movements a day.
 - Rifaximin – This is an antibiotic often used in addition to lactulose. In certain cases, this medicine is used to prevent recurrent episodes of hepatic encephalopathy.

- **Esophageal varices** – These are swollen veins lining the esophagus caused by portal hypertension. The treatment goal is to prevent life-threatening bleeding from esophageal varices. Your doctor will talk with you about performing a procedure called an upper endoscopy (EGD). This test checks for varices of the upper GI tract and can help determine how frequently the EGD needs to be repeated.
 - If varices are found, treatment depends on the size of the varices and whether or not you have had a prior bleeding episode(s) from the esophageal varices. If the varices are very small, these can sometimes be monitored with repeat upper endoscopies.
 - In some cases, blood pressure medicine can be prescribed to help decrease portal hypertension that causes esophageal varices.
 - If varices are large, then your doctor may talk with you about one of two treatments.
 - One option is called banding. This treatment involves placing a rubber band around the varices by an endoscopy procedure.
 - Another option is treatment with a specific blood pressure medicine, called a non-selective beta-blocker (NSBB).
 - Your doctor will talk with you about which treatment option is best for you and the timing of your next upper endoscopy.

- **Portal vein thrombus** – A blood clot in the veins of the liver.
 - This can arise as a result of having cirrhosis or in relation to underlying liver cancer, or other cancer.
 - This condition is generally diagnosed by CT, ultrasound or MRI imaging.
 - If a clot is found, and depending on the extent of the clot, your doctor will discuss whether specific treatment is needed.
 - This condition can worsen the severity of portal hypertension that is already present.

- **Acute kidney injury** – The kidneys are very sensitive in patients with cirrhosis, especially in patients who have ascites. Your doctor may order a serum creatinine (Cr) test. This routine test measures the level of creatinine in your blood and provides an estimate of how well your kidneys function. In some cases, reduced kidney function may be permanent, which can affect the electrolytes in the body, worsen retention of fluid and cause overall swelling.
 - If you are prescribed fluid pills, your doctor will closely monitor your kidney function and electrolytes.
 - If your Cr level is elevated, your doctor will talk with you about the next step. Your doctor may be able to closely manage your care as an outpatient or you may need to visit

a hospital emergency center to be admitted as an inpatient. In the hospital, you can receive urgent care, depending on the severity of the kidney injury.

- **Itching** – Can be caused by bile build-up. Anti-itching medicines can sometimes help relieve symptoms.
- **Liver toxicity** – Certain medicines broken down or filtered by the liver may cause liver damage or lead to abnormal levels of liver enzymes in the blood. This may require your doctor to change your medicine or the dose. **Do not** drink alcohol, including beer, non-alcoholic beer (which generally still contains a small percentage of alcohol) or wine.
- **Liver cancer** – Patients with cirrhosis are at increased risk for developing liver cancer.
 - Your doctor will talk with you about using an abdominal imaging test (such as ultrasound, CT or MRI) to screen for suspicious liver lesions (spots) every 6 months along with a tumor marker (blood test) as part of liver cancer screening. Whether or not you should have screening also depends on your current underlying diseases or non-liver cancer.
 - If a screening exam shows a suspicious spot, your doctor will discuss additional testing with you. Your doctor could refer you to a specialized cancer doctor if liver cancer is suspected.
- **Liver transplant** – Certain patients with cirrhosis may benefit from evaluation for a liver organ transplant at another institution that offers liver transplant services. Whether a patient is a potential transplant candidate depends on circumstances such as the status of a non-liver cancer (if it has been in remission for several years), the stage of a newly diagnosed liver cancer, other existing medical problems and specific criteria based on lab tests.

Your care provider can answer your questions and concerns. Because every patient is different, treatment plans vary from patient to patient. It is important to talk to a health care provider who is familiar with your case.

Screening and Surveillance

Liver Cancer Screening


- Patients with cirrhosis have an increased risk of developing primary liver cancer compared to those without cirrhosis.
- In general, if eligible based on your health, patients with cirrhosis are screened every 6 months with abdominal imaging to look for suspicious spots in the liver. At the same time, patients often have a blood test for a tumor marker called AFP (alpha-fetoprotein).
- Ultrasound, CT and MRI are common imaging tests for liver cancer. Your doctor will decide which tests are best for you.

Variceal Screening and Surveillance

- Cirrhosis can cause large varices to form in the GI tract, often in the esophagus and sometimes in the stomach.

- You doctor will talk with you about getting an upper endoscopy (or EGD) if you have not had one yet, or to repeat an EGD depending on any prior findings of varices. It is important to check if you have varices. If you do, your doctor can treat you to help reduce the risk of a severe life-threatening bleeding event.
- When non-bleeding large varices are found in the esophagus, your doctor may talk with you about the best way to reduce the risk of future bleeding. This may include taking medicine (such as an NSBB mentioned on page 4) or by the use of an endoscopic banding procedure.

Health Maintenance and Prevention

- Your doctor will determine if you need testing for immunity to hepatitis A and B through bloodwork and whether or not you meet criteria to be vaccinated. You may need vaccines against hepatitis A and B if you are not immune. Vaccines can help reduce your chances of developing liver injury from a **preventable** viral hepatitis infection. You should consult with your cancer doctor about getting these vaccines, depending on the results of your blood tests.
-  Annual flu, Tdap, pneumococcal disease, MMR and zoster vaccines are some of the other recommended vaccines in adults with chronic liver disease. However, you must consult with your cancer doctor if it is safe for you to get any of these vaccines.
- You may also talk with your doctor about bone health and your vitamin D levels. Your doctor may want to test these levels to determine if you need to take nutritional supplements.

Nutrition

Patients with cirrhosis are at risk for malnutrition, especially those who are underweight and have advanced cirrhosis. Malnutrition happens when the body does not receive enough nutrients for proper function. Follow these guidelines:

- It is important to have adequate protein in your diet. Protein sources include chicken, turkey, cooked fish (absolutely no raw seafood), eggs and egg whites.
- Eat fresh fruits and vegetables.
- If you have ascites and swelling, maintain a sodium (salt)-restricted diet. Your care team will talk with you about this.
- Some patients need specific vitamin supplements. Your care team will talk with you about this.
- Your doctor may refer you to a dietitian to discuss your dietary needs.

Self-Care and Precautions

- Tylenol (acetaminophen) is considered safe to use if you have cirrhosis, but with special precautions. If you take acetaminophen as needed for mild-to-moderate pain or for fevers, **do not** take more than 2 grams of acetaminophen, or 4 extra-strength tablets in a 24-hour span. Check all medicine, since many combination products contain acetaminophen.
- If possible, **avoid taking** non-steroidal anti-inflammatory medicines or products (NSAIDs). Examples include Aleve[®], Advil[®], Motrin[®], Celebrex[®], BC Powder[®], etc. However, if you have a medical need for taking a daily aspirin, confirm this with your doctor.



- **Do not:**
 - Take herbal or other dietary supplement products
 - Eat raw seafood including raw oysters, undercooked or raw meat or unpasteurized (raw or uncooked) dairy products
 - **Smoke, drink alcohol or use any type of illegal drugs**
- In warm months, avoid skin contact with salt water and sand.
- If you have fluid overload (edema or ascites), your doctor will likely recommend diet changes. As described above, this may include a salt-restricted diet of no more than 2 grams total salt per day. Avoid eating very salty foods such as canned soup and pickled foods. **Do not** use a salt substitute. Instead, use lemon juice and no-salt products like Mrs. Dash[®] to season food.
- Problems from cirrhosis include liver failure and liver cancer. You should have regular medical check-ups and screening for liver cancer (blood test and liver imaging scan) every 6 months.
- It is important to watch your health closely to help avoid situations that could worsen your liver health.
- If you see a dentist, tell your dentist that you have cirrhosis and ask whether you need antibiotics before routine teeth cleaning and other dental procedures.



Contact your care provider right away if:

- You are very tired or have weakness that is getting worse
- You have gained weight, and your belly area is bloated, swollen or distended, and you do not know why
- Your legs, ankles or feet are swollen
- You have a fever of 100.4°F (38°C) or higher
- You develop jaundice (or yellowing of the eyes or skin)
- You are bruising easily or have unexplained bleeding
- You notice sudden abnormal changes in the kidney function (elevations in serum creatinine level) in your routine blood work



Emergency Care

Seek emergency medical care right away if you:

- Vomit bright red blood or a material that looks like coffee-grounds
- Have blood in your stools, whether it is new bright red blood, dark red/maroon-colored stool, or black tarry stool
- Feel very lightheaded
- Have chest pain or trouble breathing
- Become confused

In case of an emergency, call 911 or go to the nearest hospital emergency center. The MD Anderson Acute Cancer Care Center is open 24 hours a day, every day. From Holcombe Boulevard, turn at Entrance Marker 3. The entrance is on Bates Street for patient drop off only. You can park in Garage 2.

Follow-Up Care

- Your doctor will determine the timing of clinic follow-up visits.
- The clinic will contact you when you need labs tests.
- If your liver doctor plans to see you for routine follow-up visits and you notice that you do have an appointment, contact the Gastrointestinal/liver clinic directly to ask about appointments.

Resources

American Liver Foundation

<https://liverfoundation.org/for-patients/about-the-liver/diseases-of-the-liver/cirrhosis/>

The National Institute of Diabetes, Digestive and Kidney Diseases (NIDDK)

Phone: 800-860-8747

<https://www.niddk.nih.gov/health-information/liver-disease>