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1. The liver receives a dual blood supply from the hepatic portal vein and hepatic arteries. The hepatic portal vein delivers around 75% of the liver's blood supply and carries venous blood drained from the spleen, gastrointestinal tract, and its associated organs. The hepatic arteries supply arterial blood to the liver, accounting for the remaining quarter of its blood flow. Oxygen is provided from both sources; about half of the liver's oxygen demand is met by the hepatic portal vein, and half is met by the hepatic arteries. The hepatic artery also has both alpha- and beta-adrenergic receptors; therefore, flow through the artery is controlled, in part, by the splanchnic nerves of the autonomic nervous system. Blood flows through the liver sinusoids and empties into the central vein of each lobule. The central veins coalesce into hepatic veins, which leave the liver and drain into the inferior vena cava. The veins that drain as direct branches into the portal vein include the cystic vein, the superior pancreaticoduodenal vein and the left and right gastric veins. The venous drainage of the liver itself occurs via the three hepatic veins which consist of an accumulation of central veins and take the deoxygenated hepatic blood directly to the inferior vena cava just before it passes up through the diaphragm.

2(a) Cirrhosis is a slowly developing disease in which healthy liver tissue is replaced with scar tissue. The scar tissue blocks the flow of blood through the liver and slows the liver’s ability to process nutrients, hormones, drugs and natural toxins (poisons). It also reduces the production of proteins and other substances made by the liver. Cirrhosis eventually keeps the liver from working properly.

**CAUSES:** The most common causes of cirrhosis are chronic (long-term) [viral infections](https://my.clevelandclinic.org/health/diseases/4245-hepatitis-viral-hepatitis-a-b--c) of the liver (hepatitis types [B](https://my.clevelandclinic.org/health/diseases/4246-hepatitis-b) and [C](https://my.clevelandclinic.org/health/diseases/15664-hepatitis-c)), [fatty liver](https://my.clevelandclinic.org/health/diseases/15831-fatty-liver-disease) associated with obesity and [diabetes](https://my.clevelandclinic.org/health/diseases/7104-diabetes-mellitus-an-overview), and [alcohol abuse](https://my.clevelandclinic.org/health/diseases/3909-alcoholism). In addition, anything that damages the liver can cause cirrhosis, including the following inherited diseases:

1. [Cystic fibrosis](https://my.clevelandclinic.org/health/diseases/9358-cystic-fibrosis);
2. [Glycogen storage diseases](https://my.clevelandclinic.org/health/diseases/15553-glycogen-storage-disease-gsd), in which the body is unable to process glycogen (a form of sugar that is converted to glucose and serves as a source of energy for the body);
3. Alpha-1 antitrypsin deficiency (an absence of a specific enzyme in the liver);
4. Diseases caused by abnormal liver function, such as [hemochromatosis](https://my.clevelandclinic.org/health/diseases/14971-hemochromatosis) (a condition in which excessive iron is absorbed and deposited into the liver and other organs), and Wilson's disease (the abnormal storage of copper in the liver);
5. Autoimmune diseases of the liver (chronic conditions in which the body’s own immune system attacks the liver or bile duct cells), including: [autoimmune hepatitis](https://my.clevelandclinic.org/health/diseases/17867-autoimmune-hepatitis); [primary biliary cholangitis](https://my.clevelandclinic.org/health/diseases/17715-primary-biliary-cholangitis-pbc-) and primary sclerosing cholangitis; and overlap syndromes;
6. Blockage of the bile duct. The bile duct carries bile that is formed in the liver to the intestines, where it helps in the digestion of fats.
7. Repeated bouts of heart failure, with fluid backing up into the liver and causing congestion (clogging).

Although less likely, other causes of cirrhosis include reactions to prescription drugs, lengthy exposure to environmental toxins, or infections by parasites.

**Symptoms:** The symptoms of cirrhosis depend on the stage of the illness. In the beginning stages, there may not be any symptoms. As the disease gets worse, symptoms may include:

* Loss of appetite
* Lack of energy (fatigue)
* [Weight loss](https://my.clevelandclinic.org/health/diseases/17770-unexplained-weight-loss) or sudden weight gain
* Bruises
* Yellowing of skin or the whites of eyes ([jaundice](https://my.clevelandclinic.org/health/diseases/15367-adult-jaundice))
* Itchy skin
* Fluid retention ([edema](https://my.clevelandclinic.org/health/diseases/12564-edema)) and swelling in the ankles, legs and abdomen
* A brownish or orange color to the urine
* Light-colored stools
* Confusion, disorientation, personality changes
* Blood in the stool
* [Fever](https://my.clevelandclinic.org/health/symptoms/10880-fever)

An early sign of cirrhosis is retaining (holding onto) fluid and salt. This may start as a swollen ankle or leg, but can move on to significant fluid retention in the abdomen (ascites). By reducing [salt](https://my.clevelandclinic.org/health/articles/15426-sodium-controlled-diet) in the diet, and using the right combination of diuretics (water pills), fluid retention can be lessened for some time. In more severe cases, a doctor may need to drain fluid from the abdomen. Fluid in the abdomen can become infected (a condition called [peritonitis](https://my.clevelandclinic.org/health/diseases/17831-peritonitis)), which requires quick diagnosis and treatment with antibiotics. Some people with severe fluid retention that does not improve with treatment may need a [liver transplant](https://my.clevelandclinic.org/health/treatments/8111-liver-transplantation).

(b) Fatty liver disease is the accumulation of abnormal amounts of fat within the liver cells (hepatocytes). Fatty liver disease can progress to cause cirrhosis (scarring of the liver) and liver failure. It usually does not cause symptoms and signs unless there is progression to liver failure. Complications of cirrhosis are the main causes of signs and symptoms of fatty liver disease. These can include abdominal pain, swollen belly, swollen legs, jaundice (yellowing of the skin and the whites of the eyes), and tiredness. Enlargement of the breasts in men is another possible associated sign.

**Causes of fatty liver disease:** Fatty liver disease can be caused by excess alcohol consumption or other causes, in which case it is known as nonalcoholic fatty liver disease.

Other fatty liver disease symptoms and signs

* Abdominal Pain
* Breast Enlargement in Men
* Enlarged Blood Vessels Beneath the Skin
* Jaundice
* Red Palms
* Swollen Belly
* Swollen Legs
* Tiredness
* Weight Loss

(C) Budd-Chiari syndrome is a rare disorder characterized by narrowing and obstruction (occlusion) of the veins of the liver (hepatic veins). Symptoms associated with Budd Chiari syndrome include pain in the upper right part of the abdomen, an abnormally large liver (hepatomegaly), and/or accumulation of fluid in the space (peritoneal cavity) between the two layers of the membrane that lines the stomach (ascites). Additional findings that may be associated with the disorder include nausea, vomiting, and/or an abnormally large spleen (splenomegaly). The severity of the disorder varies from case to case, depending upon the site and number of affected veins. In some cases, if the major hepatic veins are involved, high blood pressure in the veins carrying blood from the gastrointestinal (GI) tract back to the heart through the liver (portal hypertension) may be present. In most cases, the exact cause of Budd-Chiari syndrome is unknown.

**Signs & Symptoms**

The majority of the patients who have Budd Chiari syndrome have the *three* chief manifestations:

1. **Ascites** – abdomen becomes distended because of the fluid accumulation in the abdominal cavity
2. **Pain in the abdomen** – sudden in onset, accompanied by nausea and vomiting
3. **Hepatomegaly** – enlargement of the liver, blood can flow toward the liver, but not away from it

The accumulation of blood inside the liver can destroy the liver cells. This may subsequently lead to jaundice or yellowish discoloration of the eyes and skin and problems in the kidney.

**Causes**

Usually Budd Chiari syndrome was brought about by a blood disorder, for instance polycythemia vera or Sickle cell disease. Furthermore, it can also be brought about by the use of birth control pills, pregnancy, liver cancer, liver trauma, infection, and autoimmune diseases.The causes or underlying conditions that can cause Budd Chiari Syndrome are the following:

1. hepatic vein thrombosis
2. hepatic vein compression caused by a tumor
3. pregnancy and the use of birth control pills
4. infection
5. blood disorders
6. congenital venous webs
7. inferior vena caval narrowing

(d) Hepatitis is an inflammation of the liver. The condition can be self-limiting or can progress to fibrosis (scarring), cirrhosis or liver cancer. Hepatitis viruses are the most common cause of hepatitis in the world but other infections, toxic substances (e.g. alcohol, certain drugs), and autoimmune diseases can also cause hepatitis. There are 5 main hepatitis viruses, referred to as types A, B, C, D and E. These 5 types are of greatest concern because of the burden of illness and death they cause and the potential for outbreaks and epidemic spread. In particular, types B and C lead to chronic disease in hundreds of millions of people and, together, are the most common cause of liver cirrhosis and cancer. Hepatitis A and E are typically caused by ingestion of contaminated food or water. Hepatitis B, C and D usually occur as a result of parenteral contact with infected body fluids. Common modes of transmission for these viruses include receipt of contaminated blood or blood products, invasive medical procedures using contaminated equipment and for hepatitis B transmission from mother to baby at birth, from family member to child, and also by sexual contact. Acute infection may occur with limited or no symptoms, or may include symptoms such as jaundice (yellowing of the skin and eyes), dark urine, extreme fatigue, nausea, vomiting and abdominal pain. Signs and symptoms of acute hepatitis appear quickly. They include:

* [fatigue](https://www.healthline.com/symptom/fatigue)
* [flu-like symptoms](https://www.healthline.com/health/flu-symptoms)
* [dark urine](https://www.healthline.com/symptom/dark-urine)
* [pale stool](https://www.healthline.com/symptom/pale-stools)
* abdominal pain
* [loss of appetite](https://www.healthline.com/symptom/anorexia)
* unexplained weight loss
* yellow skin and eyes, which may be signs of [jaundice](https://www.healthline.com/health/jaundice-yellow-skin)
* Chronic hepatitis develops slowly, so these signs and symptoms may be too subtle to notice.

(b) Liver cancer is cancer that begins in the cells of your liver. Your liver is a football-sized organ that sits in the upper right portion of your abdomen, beneath your diaphragm and above your stomach. Several types of cancer can form in the liver. The most common type of liver cancer is hepatocellular carcinoma, which begins in the main type of liver cell (hepatocyte). Other types of liver cancer, such as intrahepatic cholangiocarcinoma and hepatoblastoma, are much less common. Cancer that spreads to the liver is more common than cancer that begins in the liver cells. Cancer that begins in another area of the body such as the colon, lung or breast and then spreads to the liver is called metastatic cancer rather than liver cancer. This type of cancer is named after the organ in which it began such as metastatic colon cancer to describe cancer that begins in the colon and spreads to the liver. Most people don't have signs and symptoms in the early stages of primary liver cancer. When signs and symptoms do appear, they may include:

* Losing weight without trying
* Loss of appetite
* Upper abdominal pain
* Nausea and vomiting
* General weakness and fatigue
* Abdominal swelling
* Yellow discoloration of your skin and the whites of your eyes (jaundice)
* White, chalky stools