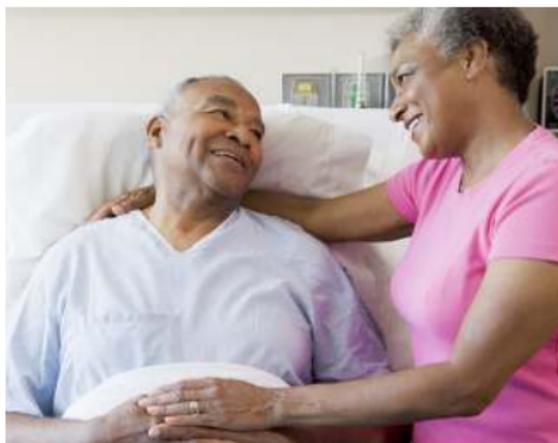
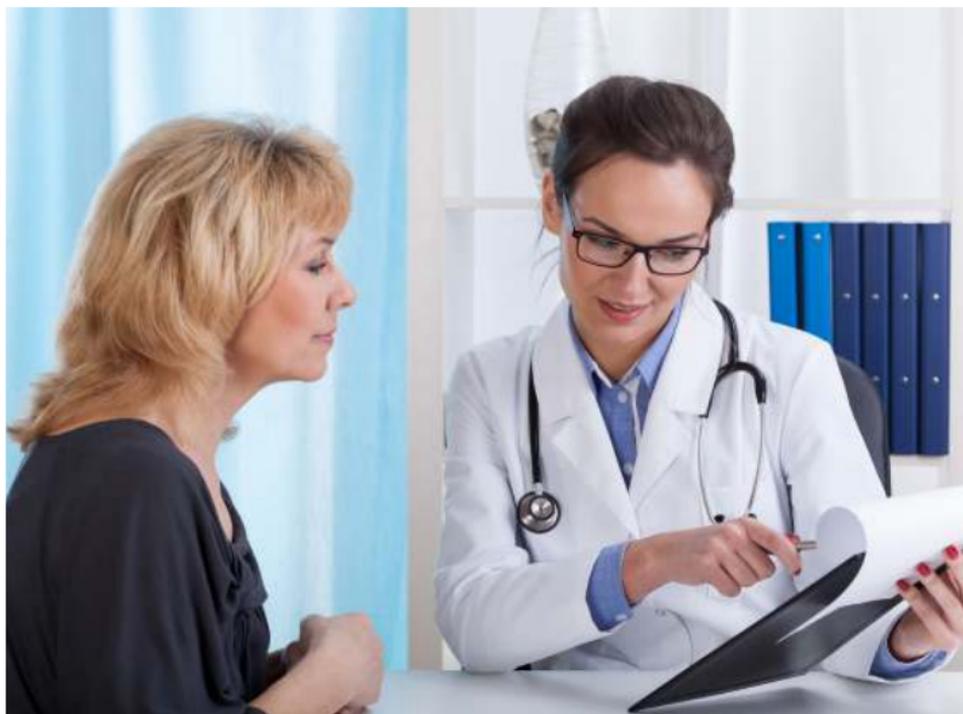


Progression of Liver Disease



Why is the liver important?

The liver is the second largest organ in your body and is located under your rib cage on the right side. It weighs about three pounds and is shaped like a football that is flat on one side.

The liver performs over 500 essential jobs in your body. Its biggest job is to filter the blood to process what you eat and drink into energy and nutrients your body can use. The liver also removes harmful substances from your blood.

The liver is an organ that can repair itself, or regenerate, even if scar tissue has formed. If someone's liver disease can be treated, well-managed, or cured early in the progression of liver disease, the liver will often be able to recover from damage.

Many people with liver disease do not look or feel sick but damage is still happening. At a certain point in the progression of liver disease, once people start having symptoms, the damage tends to become irreversible and can lead to liver failure, liver cancer, or death.

What are common causes of liver disease?

Common causes of liver disease include:

- Viruses
- Poor diet and/or obesity
- Excessive alcohol use
- Genetics
- Autoimmune disease
- Reactions to medications, street drugs, or toxic chemicals

Most liver diseases result in similar damage to the liver and for many, the progression of liver disease looks the same regardless of the underlying disease.

What is hepatitis, or inflammation, of the liver?

Inflammation (swelling) of the liver, also known as hepatitis, is usually the first stage of liver disease. Inflammation is generally a sign that the body is trying to fight an infection or heal an injury. When liver disease is present, inflammation continues over time. This leads to scarring of the liver. Many people with hepatitis have no symptoms; however, some may feel tired or have abdominal (belly area) discomfort.

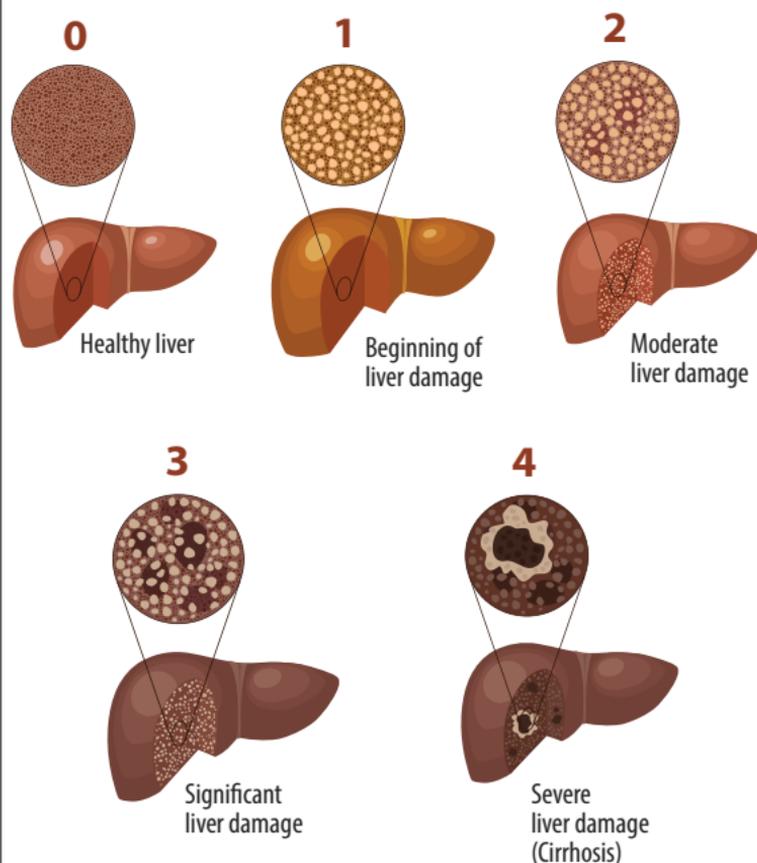
Hepatitis is often diagnosed through blood and imaging tests. If the liver disease is diagnosed and treated successfully at this stage, the inflammation may go away.

What is fibrosis?

Fibrosis is the formation of scar tissue in the liver that replaces healthy tissue. As scar tissue builds up, the liver may not work as well as it once did. The scar tissue affects the flow of blood in the liver, making it hard for the liver to function. People with fibrosis usually do not have symptoms of illness until it progresses to cirrhosis. People with fibrosis may have normal liver function tests because the liver is working even though damage is happening. Many people live with fibrosis for many years without knowing they have liver disease. It is important to remember that the process of fibrosis progressing to cirrhosis happens over a long period of time. The time it takes for fibrosis to progress is different for every disease and every person. Not everyone who develops fibrosis will progress to cirrhosis. Not everyone who gets cirrhosis will get cancer.

Fibrosis is diagnosed by blood and imaging tests. A liver biopsy may be needed to check how much liver scarring has formed. During a biopsy, a small piece of liver tissue is removed with a needle and

STAGES OF LIVER DAMAGE



looked at under a microscope. The tests a doctor does to diagnose fibrosis will provide information about the stage of fibrosis a person has. The most common scale used in the United States uses a rating of 0-4. A stage 0 is no fibrosis. A stage 4 is definite or likely cirrhosis.

If the liver disease is diagnosed and successfully treated in the stage of fibrosis, the liver may be able to heal on its own over time.

If you have been diagnosed with liver disease, it is important to know the stage of your liver damage. Knowing the stage of your liver disease will affect the decisions you and your care team make about your health. People with more advanced fibrosis or cirrhosis will need to be monitored for liver cancer. They may need to avoid certain medications, and they may need to be seen by their doctors more frequently for blood tests.

What is cirrhosis?

Cirrhosis is severe scarring of the liver. It can take many years for liver disease to lead to cirrhosis. As the amount of scar tissue in the liver increases, replacing healthy tissue, the liver may not be able to perform its jobs.

Symptoms of cirrhosis may include:

- Loss of appetite
- Tiredness
- Nausea
- Weight loss
- Abdominal pain
- Spider-like blood vessels on the skin
- Severe itching

Cirrhosis can lead to complications, which may include:

- Jaundice (yellowing of the skin and whites of the eyes)
- Gallstones
- Bruising and bleeding easily
- Fluid buildup and painful swelling of the legs (edema) and abdomen (ascites)
- Mental confusion (hepatic encephalopathy)
- Infection
- Internal bleeding from enlarged veins
- Damage to other organs, often the kidneys

The liver needs to lose about 90% of its function to lead to some of the more serious complications listed above.

Cirrhosis is diagnosed by symptoms and through blood and imaging tests. A liver biopsy may be needed to check how much of the liver has been damaged.

Treatment for cirrhosis depends on the cause and the level of liver damage. The goals of treatment are to prevent further liver damage and to treat the symptoms and complications of cirrhosis.

What is liver cancer and when can it develop?

Liver cancer is the growth and spread of unhealthy cells in the liver. Cancer that develops in the liver is called primary liver cancer. The most common form is called hepatocellular carcinoma. Cancer that starts in another part of the body and spreads to the liver is called metastatic liver cancer.

Primary liver cancer can develop during the progression of liver disease. It often occurs only if cirrhosis is present. There are people without cirrhosis, however, who may develop liver cancer. For example, people with chronic (long-term) hepatitis B are at risk for developing primary liver cancer without first having cirrhosis.

Often there are no symptoms of liver cancer until it is in an advanced stage. When symptoms do occur, they may include:

- Fatigue
- Bloating
- Pain on the right side of the upper abdomen, back, or shoulder
- Nausea
- Loss of appetite
- Weight loss
- Weakness
- Fever
- Jaundice

Liver cancer is usually diagnosed by blood and imaging tests. A liver biopsy may be needed to determine if the cells are cancerous.

Liver cancer treatment depends on:

- The overall health of the liver
- The size, location, and number of tumors
- Whether the cancer has stayed within or spread outside of the liver
- The person's age and overall health

What happens when liver failure occurs?

Liver failure, or end-stage liver disease, occurs if the liver is losing or has lost all function.

The first symptoms of liver failure are usually:

- Nausea
- Loss of appetite
- Fatigue
- Diarrhea

As liver failure progresses, symptoms may include:

- Confusion
- Extreme tiredness
- Coma
- Kidney failure

Chronic liver failure indicates the liver has been failing gradually, possibly for years. Acute liver failure occurs suddenly and is often a reaction to poisoning or medication overdose. It may also occur due to acute viral hepatitis or other causes of liver disease. If the liver is failing, a liver transplant may be needed.

What is liver transplant?

A liver transplant is the process of replacing a sick liver with a donated, healthy liver. Liver transplants require that the blood type and body size of the donor match those of the person receiving the transplant.

Liver transplants are often performed using livers from registered organ donors who have died. However, because livers can regenerate (rebuild themselves), it is possible to accept donations of partial livers from living donors. Liver transplant surgery usually takes between four and 12 hours. Most patients stay in the hospital for up to three weeks after surgery. In the United States, the number of people who need liver transplants is higher than the number of available livers for transplantation.

The transplant list is organized by something called a MELD score. The MELD score (or Model for End Stage Liver Disease) is based on blood work and assesses the severity of chronic liver disease. Scores range from 6 to 40 (40 being very sick). This score is used to ensure that the sickest people get livers first. Points may be added or removed as someone waits for a transplant. Some conditions, like liver cancer, add extra points to someone's MELD score because their risk of death increases.

The evaluation process to determine if someone is a candidate for liver transplantation begins with a referral from the patient's doctor for an evaluation at a transplant hospital. The patient then meets with members of the transplant team (clinical coordinator, doctor/surgeon, financial coordinator and/or social worker, and dietitian). The team assesses:

- All aspects of the patient's physical condition, including MELD score
- The patient's psychological well-being
- The patient's financial needs that must be met before, during, and after the transplant
- The patient's nutritional needs before and after the transplant
- The patient's available emotional support network (family and friends)

Every hospital has its own conditions about who it accepts for transplant. If the team at a patient's preferred hospital finds that he or she is eligible for a liver transplant, they will add that person to the transplant waiting list.

There are many factors that determine how long a person will be on the transplant waiting list. These factors include:

- Whether the liver disease is acute or chronic
- The person's level of illness
- How well the patient matches with a potential donor (e.g., blood type, body size)
- The number of available donors in the transplant candidate's region

After receiving a liver transplant, the patient must take medicines to help prevent their bodies from rejecting the transplanted organ. These medicines are called immunosuppressants, or anti-rejection drugs. Most patients are on these medications for the rest of their lives.

People usually stay in the hospital for a week to ten days following transplant surgery. Recovery times can vary, but most people can return to normal activities within a few months to one year after their transplants.

In some cases, the liver disease a person had before a transplant can come back and affect the new liver. If this happens, the person may need treatment or possibly a second liver transplant.



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