

# Liver Biopsy

*National Digestive Diseases Information Clearinghouse*



U.S. Department  
of Health and  
Human Services

NATIONAL  
INSTITUTES  
OF HEALTH

**NIDDK**  
NATIONAL INSTITUTE OF  
DIABETES AND DIGESTIVE  
AND KIDNEY DISEASES

## What is a liver biopsy?

A liver biopsy is a procedure to remove a small piece of the liver so it can be examined with a microscope for signs of damage or disease. The three main types of liver biopsy are percutaneous, transvenous, and laparoscopic.

## What is the liver?

The liver is a vital organ with many important functions.

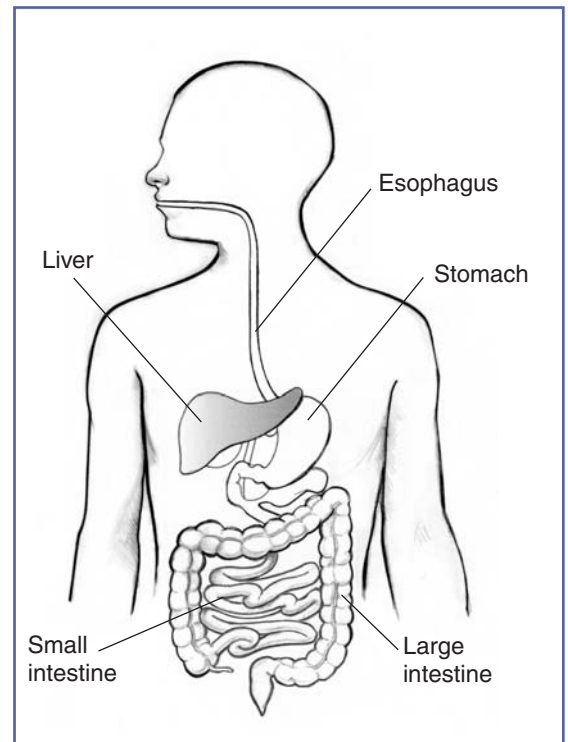
### The liver

- removes harmful chemicals from the blood
- fights infection
- helps digest food
- stores nutrients and vitamins
- stores energy

## When is a liver biopsy performed?

A liver biopsy is performed when a liver problem is difficult to diagnose with blood tests or imaging techniques, such as ultrasound and x ray.

More often, a liver biopsy is performed to estimate the degree of liver damage—a process called staging. Staging helps guide treatment.



The liver is a vital organ.

## How does a person prepare for a liver biopsy?

At least 1 week before a scheduled liver biopsy, patients should inform their doctor of all medications they are taking. Patients may be asked to temporarily stop taking medications that affect blood clotting or interact with sedatives, which are sometimes given during a liver biopsy.

Medications that may be restricted before and after a liver biopsy include

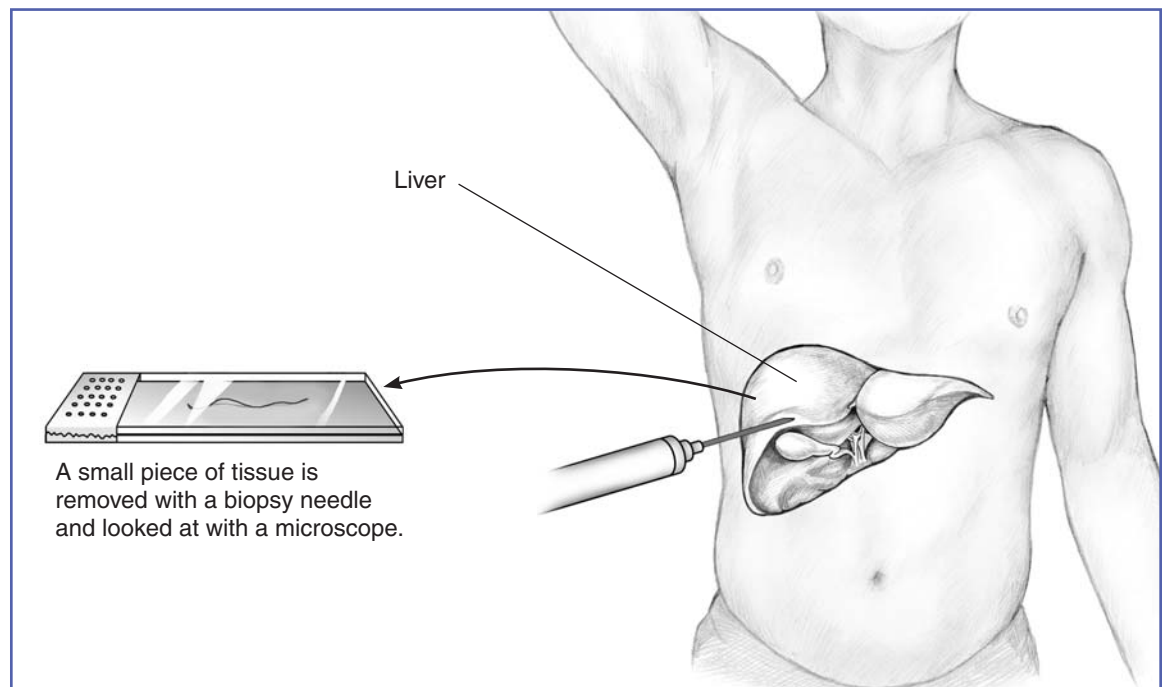
- nonsteroidal anti-inflammatory drugs, such as aspirin, ibuprofen, and naproxen
- blood thinners
- high blood pressure medication
- diabetes medications
- antidepressants
- antibiotics
- asthma medications
- dietary supplements

Prior to liver biopsy, blood will be drawn to determine its ability to clot. People with severe liver disease often have blood clotting problems that can increase the risk of bleeding after the procedure. A medicine given just before a liver biopsy, called clotting factor concentrates, reduces the risk of bleeding in patients with blood clotting abnormalities.

Patients who will be sedated should not eat or drink for 8 hours before the liver biopsy and should arrange a ride home, as driving is prohibited for 12 hours after the procedure. Mild sedation is sometimes used during liver biopsy to help patients stay relaxed. Unlike general anesthesia where patients are unconscious, patients can communicate while sedated but then often have no memory of the procedure. Sedatives are often given through an intravenous (IV) tube placed in a vein. The IV can also be used to give pain medication, if necessary, after the procedure.

## How is a liver biopsy performed?

All three main types of liver biopsy remove liver tissue with a needle; however, each takes a different approach to needle insertion. A liver biopsy may be performed at a hospital or outpatient center.



Percutaneous liver biopsy.

## **Percutaneous Liver Biopsy**

The most commonly used technique for collecting a liver sample is percutaneous liver biopsy. For this method, a hollow needle is inserted through the abdomen into the liver to remove a small piece of tissue.

To help find the liver and avoid sticking other organs with the biopsy needle, doctors often use ultrasound, computerized tomography (CT), or other imaging techniques.

Ultrasound is an imaging technique that uses sound waves to create images of the body's internal tissues and organs. Ultrasound images are displayed on a video monitor. The doctor chooses the best spot on the abdomen for inserting the biopsy needle and then marks the spot with ink. In other cases, ultrasound is used during a biopsy to safely guide the needle through the abdomen and into the liver.

CT is an imaging technique that takes hundreds of cross-sectional x rays in a few seconds. Putting together the cross-sectional x-ray pictures—like lining up slices of a loaf of bread—a computer forms a whole image of the internal organ.

Some doctors do not use an imaging technique and instead locate the liver by tapping on the abdomen.

During the procedure, patients lie on their back on a table with their right hand resting above their head. A local anesthetic is applied to the area where the biopsy needle will be inserted. If needed, an IV tube is used to give sedatives and pain medication.

The doctor makes a small incision in the abdomen, either toward the bottom of the rib cage or just below it, and inserts the biopsy needle. Patients will be asked to exhale and hold their breath while the needle is inserted and a liver sample is quickly withdrawn. Several samples may be collected, requiring multiple needle insertions.

After the biopsy, patients must lie on their right side for up to 2 hours to reduce the risk of bleeding. Patients are then monitored an additional 2 to 4 hours after the biopsy before being sent home.

## **Transvenous Liver Biopsy**

Transvenous liver biopsy is used when a person's blood clots slowly or when excess fluid is present in the abdomen, a condition called ascites.

During the procedure, patients lie on their back on an x-ray table and a local anesthetic is applied to one side of the neck. If needed, an IV tube is used to give sedatives and pain medication.

A small incision is made in the neck and a specially designed hollow tube called a sheath is inserted into the jugular vein. The doctor threads the sheath down the jugular vein, along the side of the heart, and into one of the hepatic veins, which are located in the liver. To see the veins, the doctor injects liquid contrast material into the sheath. The contrast material lights up when x rayed, highlighting the blood vessels and showing the location of the sheath.

The doctor threads a biopsy needle through the sheath and into the liver and a liver sample is quickly withdrawn. Several samples may be collected, requiring multiple needle insertions. The sheath is carefully withdrawn and the incision is closed with a bandage.

Patients are monitored for 4 to 6 hours for signs of bleeding.

### **Laparoscopic Liver Biopsy**

Doctors use laparoscopic liver biopsy to obtain a tissue sample from a specific area or from multiple areas of the liver or when the risk of spreading cancer or infection exists.

Laparoscopic surgery is a technique that avoids making a large incision by instead making one or a few small incisions. The doctor works with special tools—including a small, lighted video camera—passed through the incisions.

A doctor may take a liver sample during laparoscopic surgery performed for other reasons, including liver surgery.

During laparoscopy, patients lie on their back on an operating table. An IV is inserted in a vein to give sedatives and pain medication. A small incision is made in the abdomen, usually just below the rib cage. A plastic, tubelike instrument, called a cannula, is inserted in the incision and the abdomen is inflated with gas. Inflation allows the doctor space to work inside the abdominal cavity.

A biopsy needle is inserted through the cannula and into the abdomen. The needle is inserted into the liver and a tissue sample is quickly withdrawn. Several samples may be collected, requiring multiple needle insertions. Any excessive bleeding because of the surgery is easily spotted with the camera and treated using an electric probe.

After liver samples are collected, the cannula is removed and the incision is closed with dissolvable stitches.

Patients will need to remain at the hospital or outpatient center for a few hours while the sedatives wear off.

## How soon do results come back from a liver biopsy?

Results from a liver biopsy take a few days to come back. The liver sample goes to a pathology laboratory where the tissue is stained. Staining highlights important details within the liver tissue and helps the pathologist—a doctor who specializes in diagnosing disease—identify signs of liver disease. The pathologist looks at the tissue with a microscope and sends a report to the patient's doctor.

## How long does it take to recover from a liver biopsy?

Most patients fully recover from a liver biopsy in 1 to 2 days. Patients should avoid intense activity, exercise, or heavy lifting during this time. Soreness around the incision site may persist for about a week. Acetaminophen (Tylenol) or other pain medications that do not interfere with blood clotting may help. Patients should check with their doctor before taking any pain medications.

## What are the risks of liver biopsy?

Pain at the biopsy site is the most frequent risk of percutaneous liver biopsy, occurring in about 20 percent of patients.<sup>1</sup> The risk of excessive bleeding, called hemorrhage, is about 1 in 500<sup>2</sup> to 1 in 1,000.<sup>3</sup> Risk of death is about 1 in 10,000 to 1 in 12,000.<sup>4</sup> If hemorrhage occurs, a procedure called embolization, assisted by an x-ray procedure used to visualize blood vessels called angiography, can be used to stop the bleeding. In some cases, a blood transfusion is necessary. Surgery can also be used to stop a hemorrhage. Other risks include puncture of other internal organs, infection, and spread of cancer cells, called cancer seeding. Transvenous liver biopsy carries an additional risk of adverse reaction to the contrast material.

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<sup>1</sup>Al KB, Shiffman M. Percutaneous liver biopsy in clinical practice. *Liver International*. 2007;27(9):1166–1173.

<sup>2</sup>Beddy P, Lyburn IL, Geoghegan T, Buckley O, Buckley AR, Torreggiani WC. Outpatient liver biopsy: a prospective evaluation of 500 cases. *Gut*. 2007;56(2):307.

<sup>3</sup>Piccinino F, Sagnelli E, Pasquale G, Giusti G. Complications following percutaneous liver biopsy. A multicentre retrospective study on 68,276 biopsies. *Journal of Hepatology*. 1986;2(2):165–173.

<sup>4</sup>Bravo AA, Sheth SG, Chopra S. Liver biopsy. *New England Journal of Medicine*. 2001;344(7):495–500.

## Points to Remember

- A liver biopsy is a procedure to remove a small piece of the liver so it can be examined with a microscope for signs of damage or disease.
- The three main types of liver biopsy are percutaneous, transvenous, and laparoscopic.
- A liver biopsy is used to diagnose liver problems or to estimate the degree of liver damage.
- Patients prepare for a liver biopsy by stopping medications that might interfere with blood clotting and by having blood drawn to make sure clotting is normal. Patients who will be sedated should not eat or drink for 8 hours before the liver biopsy and should arrange a ride home.
- All three main types of liver biopsy remove liver tissue with a needle; however, each uses a different approach to inserting the needle into the liver.
- Results from a liver biopsy take a few days to come back.
- Most patients fully recover from a liver biopsy in 1 to 2 days.
- The major risk of liver biopsy is excessive bleeding, called hemorrhage.

## Hope through Research

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) conducts and supports basic and clinical research into many digestive disorders. The NIDDK is developing techniques that use less invasive magnetic resonance imaging (MRI) for staging liver damage. MRI uses powerful magnets to create images of internal organs and tissues.

Participants in clinical trials can play a more active role in their own health care, gain access to new research treatments before they are widely available, and help others by contributing to medical research. For information about current studies, visit [www.ClinicalTrials.gov](http://www.ClinicalTrials.gov).

## For More Information

Fact sheets about other diagnostic tests are available from the National Digestive Diseases Information Clearinghouse at [www.digestive.niddk.nih.gov](http://www.digestive.niddk.nih.gov), including

- *Colonoscopy*
- *ERCP (Endoscopic Retrograde Cholangiopancreatography)*
- *Flexible Sigmoidoscopy*
- *Lower GI Series*
- *Upper GI Endoscopy*
- *Upper GI Series*
- *Virtual Colonoscopy*

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Publications produced by the Clearinghouse are carefully reviewed by both NIDDK scientists and outside experts. This publication was reviewed by Mitchell L. Shiffman, M.D., Virginia Commonwealth University Medical Center.

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