

KNOW YOUR LIVER LABS

LIVER FUNCTION TESTS: WHAT ARE THEY?

Liver function tests are blood tests used to help diagnose and monitor liver disease or damage. These tests monitor key proteins and enzymes that indicate whether the liver is functioning properly, and can determine the amount of fat or damage in the liver.

Since liver disease is often hard to see, lab tests and screenings are important. Liver function tests can be used to:

- 1 **Screen for liver infections, such as hepatitis**
- 2 **Monitor liver disease over time to find out how well a treatment is working**
- 3 **Help uncover liver diseases or liver problems**
- 4 **Assess liver inflammation**
- 5 **Monitor the side effects of medicines**

A liver test only gives us a snapshot of what is going on inside of your body, they do not always provide the full picture. The results of one lab test may not always cause concern, care providers tend to look for trends of abnormal lab results. Feeling sick or stressed can affect your lab results, so pay attention to how your body feels. Non-invasive tools can be safer and even more precise.

HOW TO PREPARE FOR MY LAB TESTS:

-  **Hydration is key.** Make sure to drink plenty of water, starting two days before your lab tests!
-  **Dress comfortably.** Opt to wear a short sleeve shirt to make the process easier.
-  **Address Medications.** Let your healthcare provider know about any medications you are on before the test as some medications may affect blood test results.
-  **Ask your lab technician** if you have any concerns about your lab tests. Reference ranges can differ with age, sex, race/ethnicity, and even by lab, so make sure to communicate with your lab technician!
-  **Follow all instructions** provided by your healthcare provider. Your healthcare provider may request that you avoid certain food and drinks or even fast for several hours before the test to help ensure the test's accuracy.

UNDERSTANDING DIFFERENT TYPES OF FUNCTION TESTS:

ALT (Alanine Aminotransferase)

ALT is an enzyme that is mostly found in your liver, though it can also reside in other parts of your body. If your liver is damaged, ALT can be released into the bloodstream causing the levels in your blood to increase. A blood test for ALT can help doctors check the health of your liver.¹

Ranges: Normal ranges are between 7 to 56 U/L (units per liter).

BUN (Blood Urea Nitrogen)

Urea nitrogen is a waste product of protein breakdown, which is then removed by your kidneys. A BUN test measures how much urea nitrogen is in your blood, which indicates how well your kidneys are working.²

Ranges: Normal ranges are between 6 to 24 mg/dL (2.1 to 8.5 mmol/L).

Globulins

This test measures your blood levels of a protein called globulin, which plays an important role in liver and kidney function, blood clotting, and fighting off viruses and infections. High globulin levels can indicate autoimmune diseases or infections while low globulin levels can indicate kidney or liver disease.³

Ranges: Normal ranges are between 2.0 to 3.5 g/DL (grams per deciliter) or 20 to 35 g/L (grams per liter).

Bilirubin

Bilirubin is the yellow pigment that results from the breakdown of hemoglobin (the pigment in red blood cells). Lower than normal bilirubin levels are usually not concerning but high levels of bilirubin in the bloodstream can indicate issues with the liver or bile ducts.⁵

Ranges: Normal ranges are between 0.3 - 1.2 mg/dL.

HbA1c (Hemoglobin A1c)

An HbA1C test is a blood test that shows what your average blood sugar level was over the last 2-3 months. Monitoring blood sugar levels are important as they can help prevent or delay long-term health complications such as diabetes.⁷

Ranges: Normal ranges are between 5.7% - 6.4%.

LDH (L-lactate dehydrogenase)

LDH is an important enzyme found in the muscles, kidneys, liver, and red blood cells; however, when body tissues are damaged they release LDH into the bloodstream. Because of this, LDH tests help detect any widespread tissue damage within the body.⁹

Ranges: For people assigned male at birth: 135-225 U/L (units per liter). For people assigned female at birth: 135-214 U/L.

PT (Prothrombin time)

Prothrombin is a protein produced by the liver to help with blood clotting. Determining your PT allows your doctor to evaluate how your blood is clotting and check for liver issues.¹¹

Ranges: If your PT results are presented in seconds, the normal range is 10-13 seconds. If your PR results are presented in international normalized ratio (INR), values of 1.1 or below are considered normal.

AST (Aspartate Aminotransferase)

AST is an enzyme found in the liver, heart, brain, pancreas, kidneys, muscles, and many other tissues in your body. High levels of AST in the blood can be a sign of an underlying medical condition such as liver disease.⁴

Ranges: Normal ranges are between 8-33 U/L.

GFR (Glomerular Filtration Rate)

GFR is the estimated rate at which the kidneys filter blood to remove any toxins or waste. Being aware of your GFR can help with early detection of kidney disease, diabetes, and other health conditions.⁶ A higher GFR indicates better kidney function.

Ranges: Average is about 116 mL/min/1.7m².

ALP (Alkaline Phosphatase)

ALP is an enzyme primarily found in the liver, but can also be found in your kidneys, bones, and digestive system. Monitoring ALP levels in the bloodstream allows for early detection of a wide range of health conditions, including liver issues, bone disorders, and kidney disease.⁸

Ranges: Normal ranges are between 44-147 IU/L.

APRI (Platelet Ratio Index)

The APRI test is a non-invasive way to determine the amount of fibrosis (scar tissue) present in the liver. The test measures AST (an enzyme your liver creates) and platelet levels (a type of blood cell) which can indicate the overall health of the liver.¹⁰

Ranges: An APRI of less than 0.5 indicates a healthy liver with very minimal fibrosis. An APRI of greater than 1.5 suggests the presence of significant scarring of the liver tissue, or even cirrhosis.

Albumin

Albumin is a protein produced by the liver and found in your blood plasma. It helps circulate vitamins, enzymes, and other substances throughout your body. Albumin blood tests help detect liver and kidney dysfunction.¹²

Ranges: Normal ranges are between 3.5-5.5 g/dL.

GGT (Gamma-glutamyltransferase)

GGT is an enzyme produced by the liver and found in the liver, kidneys, heart, brain, and pancreas. GGT may leak into your bloodstream if your liver or bile duct is damaged, so high GGT levels can indicate liver or bile duct issues at a very early stage.¹³

Ranges: 5-40 U/L (units per liter).



MY BLOOD WORK WAS JUST COMPLETED. WHAT'S NEXT?

It is important to know when to expect your results. Interpreting results and communicating them to you can take hours, days, or weeks. The doctor's office may or may not reach out to you if your results are normal or within range. If results are normal, they can usually be delivered via a secure message through a mobile app, phone call, text, or letter.

Please consult with your doctor if your lab results seem to be out of range or abnormal. Make sure to intentionally write down any questions or concerns you may have to ask your care provider.

WHEN SHOULD I GET TESTED?

Whenever you experience abnormal symptoms, are concerned about conditions that may cause liver dysfunction, or are taking medications that could damage your liver, you should have your liver function checked.

Liver function tests are generally recommended by healthcare providers when symptoms indicative of liver disease occur. These include:

- *Jaundice (yellowing of skin or eyes)*
- *Weakness or fatigue*
- *Diarrhea*
- *Abdominal pain or swelling*
- *Dark-colored urine*
- *Nausea and vomiting*
- *Light colored stool*
- *Lack of appetite*

In addition to these symptoms, liver function tests are recommended if you are at high risk for liver disease (e.g. certain medication use, family history of liver disease, etc.). While there are no specific guidelines regarding the frequency or age of testing, communicate with your provider to determine the frequency of testing that is right for you.

IMPORTANT QUESTIONS TO CONSIDER ASKING YOUR DOCTOR:

- 1 **How often should I be coming in for my lab work?**
- 2 **My lab tests are out of range, what do I do?**
- 3 **Are my current lab results concerning? If so, what can I do to manage this?**
- 4 **Should I get repeat labs or why do I need repeat labs?**
- 5 **Will my tests be affected by diet or medications?**
- 6 **How do other health conditions affect my liver labs?**
- 7 **If my results are normal, does that mean I have nothing to worry about?**

REFERENCES

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