TEST

Liver function tests

Liver function tests are blood tests that assess liver injury and how well the liver performs key tasks.

WHAT IT MEASURES
Liver enzymes, bilirubin, and proteins in blood

SAMPLE
Blood

FASTING NEEDED?
Sometimes, if combined with tests requiring fasting

HOW LONG IT TAKES
Usually less than 10 minutes

RESULTS IN
Often one day; timing differs by laboratory

USED FOR
Detecting liver injury and monitoring liver health or treatment

MAIN LIMITATION
Abnormal results do not identify one specific cause

Overview

Liver function tests are a group of blood tests. They are also called liver blood tests or a liver panel.

The name can be misleading. Some tests measure substances released when liver cells or bile ducts are irritated. Others provide information about how well the liver makes proteins or processes waste.

A typical panel may include:

A clotting test called prothrombin time or INR may be ordered separately. Because the liver makes clotting proteins, this test can provide information about liver function. However, it is also affected by blood-thinning medicines and other conditions.

The exact panel differs between laboratories and healthcare settings.

- Alanine aminotransferase (ALT) and aspartate aminotransferase (AST)
- Alkaline phosphatase (ALP) and sometimes gamma-glutamyl transferase (GGT)

- Bilirubin
- Albumin and total protein

Why the test is ordered

Liver function tests can help look for liver or bile duct problems. They may be ordered after symptoms such as yellow skin or eyes, dark urine, pale stools, itching, abdominal discomfort, nausea, or unexplained tiredness.

They may also be used to:

These tests usually cannot identify the cause by themselves. The pattern of results helps decide whether repeat blood tests, imaging, or more specific tests may be useful.

- Investigate an abnormal result found on another blood test
- Check possible effects of alcohol, medicines, or supplements
- Assess risks such as viral hepatitis or metabolic liver disease
- Monitor a known liver or bile duct condition
- Check whether treatment is working
- Monitor medicines that can sometimes affect the liver

Who should have the test

You may be offered liver function tests if you have symptoms, examination findings, medical conditions, or exposures that could affect the liver.

Testing may also be appropriate if you take a medicine that requires liver monitoring. The recommended schedule is specific to the medicine and your circumstances.

Routine testing is not necessary for everyone at the same frequency. Decisions may consider alcohol use, body weight and metabolic health, pregnancy, family history, previous results, infections, and other medical conditions.

How to prepare

Most liver panels do not require fasting. However, fasting may be requested if other blood tests, such as certain glucose or lipid tests, are being taken at the same time. Follow the

instructions on your appointment letter.

Tell the healthcare professional about prescription medicines, over-the-counter products, vitamins, herbal remedies, and gym or bodybuilding supplements. Do not stop a medicine unless you have been specifically told to do so.

Avoid unusually strenuous exercise shortly before the test if possible. Hard exercise and muscle injury can raise AST and sometimes ALT, making the pattern harder to interpret.

If your test is part of planned monitoring, try to follow any instructions about alcohol, meals, and timing. This helps make repeat results easier to compare.

What happens during the test

A healthcare professional usually takes blood from a vein in your arm. They clean the skin, place a small needle into the vein, and collect blood into one or more tubes.

You may feel a brief scratch or sting. The blood draw usually takes only a few minutes.

The sample is sent to a laboratory. Results may be available the same day or within a few days, depending on the laboratory and whether additional tests are needed.

Understanding your results

Results must be interpreted together. Reference ranges vary by laboratory, age, sex, pregnancy status, medicines, and clinical context. A result just outside a laboratory's range does not automatically mean that you have liver disease.

ALT is found mainly in the liver. A raised ALT can suggest liver cell irritation or injury, but it does not show the cause or measure the amount of permanent damage.

AST is found in the liver and in other tissues, especially muscle. An AST rise may come from the liver, muscle injury, or strenuous exercise.

ALP is present in the bile ducts but also in bone and the placenta. A raised ALP may suggest reduced bile flow, but it can also be related to bone growth, bone conditions, or pregnancy.

GGT is often used to help interpret a raised ALP. A raised GGT can support a liver or bile duct source, but it is not specific. Alcohol and several medicines can increase it.

Bilirubin is produced when old red blood cells are broken down. The liver processes it so it can leave the body in bile. A raised result may come from increased red blood cell breakdown, reduced liver processing, or blocked bile flow.

Albumin is a protein made by the liver. A low level can occur when the liver makes less protein, but kidney disease, inflammation, poor nutrition, and fluid balance can also lower it.

The pattern and change over time often matter more than one isolated number.

What affects the results

A result may be misleading even when the laboratory measurement is correct.

Recent strenuous exercise, muscle injury, injections into muscle, or surgery can raise AST and sometimes ALT. This is especially important when AST rises more than other liver-related tests.

Alcohol can change liver enzyme levels. The amount, timing, and pattern of alcohol use may all matter.

Medicines and supplements can raise enzymes or bilirubin. Examples include some antibiotics like amoxicillin or doxycycline , seizure medicines, cholesterol-lowering medicines, pain medicines, herbal products, and bodybuilding supplements. This does not mean you should stop them without advice.

Pregnancy can raise ALP because the placenta produces it. Albumin commonly becomes lower as blood volume expands. These changes require pregnancy-specific interpretation.

Children and teenagers may have a higher ALP during periods of bone growth. Age-appropriate ranges are therefore important.

Fasting can increase bilirubin in some people, particularly those with Gilbert syndrome, a common inherited difference in bilirubin processing. Dehydration and acute illness may also affect results.

Red blood cell breakdown can raise bilirubin. Breakdown of cells within the sample tube, called haemolysis, can also interfere with AST and some other measurements. The laboratory may request a new sample.

Kidney disease, inflammation, fluid overload, and poor protein intake can lower albumin without a primary liver problem. A recent blood transfusion may also affect bilirubin and the interpretation of red blood cell breakdown.

Accuracy and limitations

Liver function tests are useful for detecting patterns, but they are not perfect screening or diagnostic tests.

They can miss liver disease. Some people with long-term liver scarring may have enzyme levels within the laboratory range, especially when the condition is stable. A normal panel therefore does not rule out every liver condition.

They can also suggest a liver problem when the source is elsewhere. AST may come from muscle, ALP may come from bone or the placenta, and low albumin may result from kidney disease, inflammation, nutrition, or fluid balance.

The height of an enzyme result does not reliably show how much scarring is present. Blood tests designed to estimate fibrosis, ultrasound-based elastography, or other imaging may be better for assessing liver stiffness and scarring.

Ultrasound, CT, or MRI may be more useful when gallstones, blocked bile ducts, masses, or structural changes are suspected. Tests for viral hepatitis, autoimmune conditions, iron overload, or other specific causes may be needed. A liver biopsy is used only in selected situations when less invasive tests do not provide enough information.

Risks and complications

The main risks are a small bruise, brief soreness, or feeling faint during the blood draw. Serious complications from routine blood sampling are uncommon.

Tell the person taking the sample if you have previously fainted during blood tests or have difficulty stopping bleeding.

What happens next

If all results are within the expected range, no further testing may be needed. The result still needs to be considered alongside why the test was ordered.

A mild abnormality is often followed up routinely. This may involve repeating the panel, reviewing medicines and supplements, discussing alcohol use, or ordering more targeted blood tests.

A larger or persistent change may lead to imaging or referral for specialist assessment. The next step depends on which results are abnormal, how they have changed, and whether you have symptoms.

Seek prompt medical advice if you develop new yellowing of the eyes or skin, very dark urine, pale stools, persistent vomiting, or worsening abdominal swelling.

Get emergency help for confusion or marked drowsiness, vomiting blood, black stools, severe

abdominal pain, collapse, or heavy bleeding. These symptoms need urgent assessment rather than waiting for routine test follow-up.

Common questions

Can I drink coffee before liver function tests?

Usually, if you have not been asked to fast. If fasting is required because other tests are included, plain water is generally preferred. Milk, sugar, syrups, and cream break a fast.

Does the time of day matter?

Usually not for a routine liver panel. For repeat monitoring, testing under similar conditions can make comparisons easier. Follow any timing instructions linked to a medicine or another blood test.

Can I exercise beforehand?

Gentle activity is unlikely to be a problem. Strenuous exercise, heavy weight training, or a recent muscle injury can raise AST and sometimes ALT. Mention recent intense exercise when your results are reviewed.

Can I drink alcohol the night before?

Alcohol can affect some liver enzymes and may make the result harder to interpret. Follow the instructions given for your test and report your usual alcohol intake honestly. Do not make sudden changes if alcohol withdrawal could be a concern.

Should I stop my medicines or supplements?

Do not stop prescribed medicines unless you have been told to. Bring an up-to-date list of medicines, vitamins, herbal products, and workout supplements because these may affect the results.

Does an abnormal result mean my liver is damaged?

Not necessarily. Results may be affected by muscle, bone, pregnancy, medicines, alcohol, illness, or sample issues. Interpretation usually considers the overall pattern, previous results, symptoms, and any follow-up tests.

Sources

- American College of Gastroenterology Clinical Guideline: Evaluation of Abnormal Liver Chemistries , The American Journal of Gastroenterology , 2017

- Guidelines on the management of abnormal liver blood tests , British Society of Gastroenterology, Gut , 2018
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