TEST

Ammonia blood test

An ammonia blood test measures ammonia in your blood to investigate impaired clearance or excess production

WHAT IT MEASURES
Amount of ammonia in the liquid part of blood

SAMPLE
Blood

FASTING NEEDED?
Sometimes, if your laboratory requests it

HOW LONG IT TAKES
Usually under 10 minutes

RESULTS IN
Often same day; timing varies by laboratory

USED FOR
Diagnosis and monitoring of conditions causing excess ammonia

MAIN LIMITATION
Collection and transport delays can falsely raise the result

Overview

An ammonia blood test measures ammonia in your blood, usually in plasma, the liquid part of blood.

Ammonia is produced when your body breaks down protein and when intestinal bacteria process certain substances. The liver normally converts ammonia into urea, which leaves the body mainly through urine.

Ammonia can build up if the liver cannot process it, blood bypasses the liver, or the body produces unusually large amounts. Rare inherited conditions called urea cycle disorders can also prevent normal removal.

This is not a general liver screening test. An abnormal result cannot identify the cause by itself, and the number may not reflect how unwell someone is.

Why the test is ordered

The test is often ordered when someone has a change in brain function that could be related to excess ammonia, such as new confusion, unusual sleepiness, reduced alertness, or unexplained behavioural changes.

It may help investigate:

Ammonia cannot diagnose or grade hepatic encephalopathy on its own. Diagnosis also depends on symptoms, examination, medical history, and tests for other causes of altered mental function.

- Possible hepatic encephalopathy caused by severe liver dysfunction or blood bypassing the liver
- A possible urea cycle disorder, especially in a newborn or child
- Symptoms occurring while taking a medicine that can raise ammonia, such as valproate
- Whether treatment for a known high ammonia level is working

Who should have the test

You may need this test if your symptoms or history suggest that ammonia is not being cleared normally. It is commonly used when someone with serious liver disease develops a new change in awareness or behaviour.

A newborn may be tested urgently for poor feeding, vomiting, unusual sleepiness, abnormal breathing, or seizures. These symptoms have many causes, but rapid testing can help identify a metabolic emergency.

Testing may also be appropriate if you take valproate and develop unexplained vomiting, marked drowsiness, confusion, or reduced alertness. High ammonia can occur even without severely abnormal routine liver tests.

Routine testing is generally not useful without relevant symptoms or a condition requiring monitoring.

How to prepare

Follow the laboratory's instructions. Some laboratories require fasting, usually allowing only water for a specified period, while others do not.

Avoid vigorous exercise immediately before the blood draw because muscle activity can temporarily increase ammonia. If the test is planned, ask whether you should avoid smoking

beforehand.

Tell the healthcare professional about all medicines and supplements, particularly valproate. Do not stop prescribed medicine unless the clinician responsible for it tells you to.

In an emergency, testing and treatment should not be delayed for fasting or other preparation.

What happens during the test

A healthcare professional inserts a needle into a vein, usually in your arm, and collects a small tube of blood. This normally takes a few minutes.

Ammonia can increase after blood leaves the body, so the sample may need to be kept cold, transported promptly, and separated from blood cells quickly. Procedures vary between laboratories.

Keep your arm relaxed. Repeated fist clenching or prolonged tourniquet pressure may affect the result. If collection was difficult or processing was delayed, the laboratory may request another sample.

Understanding your results

Your report will show the result, units, and laboratory reference range. Use the range on your report rather than one found online.

Interpretation can vary with age, pregnancy, medicines, sample type, testing method, and clinical context. Newborns and young infants may have different expected values from adults.

A high result means the sample contained more ammonia than expected, but does not show why. Causes include reduced liver clearance, blood bypassing the liver, kidney dysfunction, urea cycle disorders, medicines, seizures, gastrointestinal bleeding, and sample-handling problems.

The result does not consistently reflect the severity of hepatic encephalopathy. Someone may have liver-related brain dysfunction with a result within range, or an elevated result without related symptoms.

A low result is usually not important by itself.

What affects the results

Ammonia is particularly sensitive to collection and processing. Important influences include:

Tell the healthcare team about recent illness, exercise, bleeding, transfusion, seizures, medicines, and any collection problems if the result seems unexpected.

- Delayed processing or warm storage: Ammonia may increase in the tube
- Haemolysis: Damage to blood cells can interfere with measurement
- Difficult collection: Prolonged tourniquet use or repeated fist clenching may increase the value
- Vigorous exercise or recent seizures: Muscle activity can temporarily raise ammonia
- Smoking or food: Smoking and a recent high-protein meal may affect the result
- Medicines: Valproate is a well-recognised cause of elevated ammonia
- Kidney dysfunction: The kidneys help handle nitrogen-containing waste
- Gastrointestinal bleeding: Digested blood increases the protein load
- Recent transfusion: Stored blood and the underlying illness may affect interpretation

Accuracy and limitations

The test can detect a substantial increase when the sample is collected and processed correctly. However, accuracy varies with the method, condition being investigated, and sample handling.

Delayed processing, haemolysis, muscle activity, or collection problems can produce a falsely high result. A result within range does not exclude hepatic encephalopathy, and a high result does not confirm it. No single ammonia number diagnoses this condition.

If the result does not fit your symptoms, repeating the test under carefully controlled conditions may be more useful than relying on the original result.

Other tests may be needed to find the cause, including liver and kidney blood tests, infection testing, medicine levels, or brain imaging. If a urea cycle disorder is suspected, testing may include plasma amino acids, urine orotic acid, and genetic testing.

Risks and complications

A blood draw may cause brief pain, a small bruise, minor bleeding, or faintness during or shortly after the procedure.

What happens next

An elevated result is interpreted alongside symptoms, medicines, liver and kidney function, and other findings. The test may be repeated if collection or transport could have affected it.

If you are stable and the test was planned, follow-up may include discussing the result at a scheduled appointment, reviewing medicines, or repeating the measurement under controlled conditions.

Seek emergency medical help for new confusion, inability to stay awake, a seizure, collapse, or serious breathing difficulty. A newborn or infant with poor feeding, repeated vomiting, marked sleepiness, abnormal breathing, or seizures also needs urgent assessment. Do not wait for an appointment or test result.

A mildly abnormal result without urgent symptoms usually requires routine clinical review. Its significance depends on why testing was ordered and whether the sample was handled correctly.

Common questions

Can I drink coffee before an ammonia blood test?

If told to fast, have only water unless instructed otherwise. If fasting was not requested, follow the laboratory's guidance.

Does the time of day matter?

Ammonia can vary, but correct collection and rapid processing are usually more important than the exact time. Similar collection conditions can help when comparing results.

Can I exercise beforehand?

Avoid vigorous exercise shortly before a planned test because it can temporarily raise ammonia.

Do I need to stop valproate before the test?

No, unless the clinician responsible for your prescription tells you to stop. Valproate can raise ammonia and must be considered when interpreting the result.

Why do I need another blood sample?

A repeat may be needed if the sample was delayed, became too warm, was damaged, or produced a result inconsistent with your condition.

Is a high ammonia result proof of liver failure?

No. Other causes include medicines, seizures, kidney problems, gastrointestinal bleeding,

inherited metabolic conditions, and sample-handling problems.

Sources

- MedlinePlus Medical Test: Ammonia Levels , US National Library of Medicine
- Mayo Clinic Laboratories: Ammonia, Plasma , test information and specimen requirements
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