TEST

CSF glucose test

A CSF glucose test measures sugar in the fluid surrounding your brain and spinal cord.

WHAT IT MEASURES
Glucose in fluid surrounding the brain and spinal cord

SAMPLE
Cerebrospinal fluid collected by lumbar puncture

FASTING NEEDED?
Usually no; fasting may be required before sedation

HOW LONG IT TAKES
Usually 30 to 60 minutes for lumbar puncture

RESULTS IN
Often same day; timing varies by laboratory

USED FOR
Supporting diagnosis of brain and spinal cord conditions

MAIN LIMITATION
Requires comparison with blood glucose taken around the same time

Overview

A cerebrospinal fluid, or CSF, glucose test measures glucose in the clear fluid surrounding your brain and spinal cord. Glucose is a sugar that cells use for energy.

CSF is usually collected during a lumbar puncture , also called a spinal tap. A thin needle is placed into the lower back to collect fluid. The glucose measurement is normally part of a wider CSF analysis.

CSF glucose is often compared with glucose in blood taken around the same time because blood glucose affects CSF glucose. The test cannot diagnose a condition by itself and must be interpreted with your symptoms, examination, blood tests, and other CSF results.

Why the test is ordered

The test may be ordered when a condition affecting the brain, spinal cord, or their protective coverings is suspected. Possible reasons include looking for:

CSF glucose is usually measured with protein, white and red blood cell counts, and tests for

bacteria, viruses, fungi, or cancer cells. The overall pattern is more useful than glucose alone.

- Meningitis or encephalitis
- Fungal or tuberculosis infection involving the nervous system
- Bleeding around the brain
- Inflammatory or immune-related conditions
- Cancer affecting the brain or spinal cord coverings

Who should have the test

You may be offered testing if your symptoms and examination suggest that a lumbar puncture could help identify or rule out a nervous system condition. Not everyone with headache, fever, confusion, or neck discomfort needs one.

A lumbar puncture may need to be delayed or modified if you have a significant bleeding risk, take certain blood-thinning medicines, have an infection over the lower back, or have signs of increased pressure inside the skull. Some people need brain imaging or blood-clotting tests first, although these are not required for everyone.

How to prepare

You can usually eat and drink normally. If sedation is planned, follow the facility's fasting instructions.

Tell the clinical team if you:

Do not stop prescribed blood-thinning medicine unless the clinician arranging the procedure tells you to. Bring an up-to-date medicines list.

Blood may be taken close to the lumbar puncture so the laboratory can compare CSF and blood glucose.

- Take anticoagulants like warfarin or apixaban , antiplatelet medicines, or other medicines affecting clotting
- Have a bleeding disorder or low platelet count
- Have allergies to local anaesthetic, dressings, or antiseptics
- Could be pregnant
- Have had back surgery or major spinal problems

- Have an infection, rash, or wound on your lower back

What happens during the test

You will usually lie on your side with your knees drawn up or sit leaning forward. The skin over your lower back is cleaned, and local anaesthetic is injected. This may sting briefly.

A thin needle is passed between two lower-back bones into the space containing CSF, below the usual end of the spinal cord. You may feel pressure. Tell the clinician if you have sharp pain or pain running down a leg so the needle can be repositioned.

An opening pressure may be measured before fluid is collected into several small tubes. The needle is then removed and a dressing applied. Collection takes several minutes, but preparation and observation make the appointment longer.

Understanding your results

CSF glucose is normally lower than blood glucose. There is no single result that can be interpreted safely for everyone. Interpretation varies with the laboratory method, age, blood glucose, medicines, and clinical circumstances. Newborns and young infants need age-specific interpretation.

A low CSF glucose can occur with bacterial, fungal, or tuberculosis meningitis. It may also occur with some cancers, inflammatory conditions, or bleeding around the brain. The result alone cannot identify the cause.

Many viral infections leave CSF glucose within the expected range, but this is not absolute. A result within range does not rule out meningitis or another serious condition.

A high CSF glucose usually reflects raised blood glucose and is generally less useful for identifying a specific nervous system condition.

The result is interpreted with CSF cell counts, protein, opening pressure, microbiology tests, and blood results.

What affects the results

CSF glucose reflects blood glucose over the preceding hours, so a blood sample taken too early or late can make comparison misleading.

Other influences include:

Pregnancy and sex do not usually affect CSF glucose directly, but changes in blood glucose remain relevant.

- Very high or low blood glucose
- Food, sugary drinks, intravenous glucose, and diabetes medicines
- Delayed processing: Cells and microorganisms can use glucose in the sample.
- A traumatic lumbar puncture: Blood entering the sample can complicate interpretation.
- Age: Newborns and infants require different interpretation.

Accuracy and limitations

CSF glucose is useful as part of a pattern but cannot diagnose or exclude meningitis on its own. It may remain within the expected range early in infection, with many viral infections, and occasionally with other infections.

Low CSF glucose can also result from cancer, inflammation, bleeding, or low blood glucose. Comparing it with properly timed blood glucose reduces uncertainty but does not eliminate it.

Other tests help identify the cause. CSF culture can grow bacteria or fungi, while polymerase chain reaction, or PCR, tests look for genetic material from specific organisms. Cytology and flow cytometry may be used when cancer is suspected. Results are considered together.

Risks and complications

The risks come from the lumbar puncture rather than the glucose measurement.

A headache may develop afterward, often worsening when upright and improving when lying down. Temporary back soreness, minor bleeding, or bruising may also occur.

Infection and significant bleeding around the spine are uncommon. Serious complications related to pressure inside the skull are rare because clinicians assess for warning signs and arrange imaging when needed.

Tell the clinical team promptly if a headache is severe, lasts longer than expected, or prevents normal activity. Seek urgent medical care for fever, increasing redness or fluid leakage from the puncture site, new leg weakness or numbness, difficulty passing urine, confusion, a seizure, or reduced consciousness.

What happens next

If the findings are reassuring and you are well, you may need only routine follow-up. Your clinician may review the complete CSF report later because cultures and specialised tests can take longer than glucose measurement.

An unexpected result may lead to blood tests, additional CSF testing, brain imaging, or specialist review. A repeat lumbar puncture is needed only in selected situations.

If infection is strongly suspected, treatment may begin before every result is available. This does not confirm the diagnosis; it avoids delaying care when concern is significant.

Common questions

Can I eat or drink coffee before the test?

Usually, yes. Sugar, milk, and food can affect blood glucose, however. Follow fasting instructions if you will receive sedation.

Does the time of day matter?

Usually not. The accompanying blood glucose should be collected close to the lumbar puncture.

Can I exercise beforehand?

Normal activity is usually acceptable. Strenuous exercise can affect blood glucose and hydration, so follow the facility's instructions.

Will the lumbar puncture hurt?

The anaesthetic may sting, and you may feel pressure. Report sharp or shooting pain immediately so the needle can be adjusted.

Can I drive afterward?

Policies differ. Do not drive if you received sedation, feel dizzy, or develop a headache. Ask the facility in advance and arrange transport if advised.

Why do some results take longer than others?

Glucose can often be measured quickly. Cultures need time for organisms to grow, and specialised tests may be sent to another laboratory.

Sources

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