TEST

Glucagon blood test

A glucagon blood test measures a blood-sugar-raising hormone, mainly to investigate a rare hormone-producing tumor.

WHAT IT MEASURES
Glucagon, a hormone that raises blood sugar

SAMPLE
Blood

FASTING NEEDED?
Sometimes, usually eight hours for a baseline measurement

HOW LONG IT TAKES
Usually less than 10 minutes

RESULTS IN
Usually several days; turnaround varies by laboratory

USED FOR
Diagnosing or monitoring rare glucagon-producing tumors

MAIN LIMITATION
Sample handling and assay differences can mislead

Overview

Glucagon is a hormone made mainly by alpha cells in the pancreas. It helps prevent blood sugar from falling too low by telling the liver to release stored glucose, a type of sugar.

A glucagon blood test measures the amount of this hormone in your blood. It is not a routine diabetes test. It is used mainly when a healthcare professional suspects a rare pancreatic neuroendocrine tumor that releases glucagon, called a glucagonoma.

The test may also be used in selected investigations of unusual blood sugar changes. It is different from a glucagon stimulation test , in which glucagon is given as a medicine and your body's response is measured.

Why the test is ordered

Your healthcare professional may order this test when a combination of symptoms and other results suggests excessive glucagon production. Possible reasons include:

Features that may lead to testing include newly difficult-to-control blood sugar, unexplained weight loss, diarrhea, or a distinctive recurring rash. These problems have many possible causes, so the test does not diagnose a tumor by itself.

A glucagon measurement is not normally used to screen people without relevant symptoms or findings.

- Investigating a suspected glucagon-producing pancreatic tumor
- Checking a known glucagonoma before or after treatment
- Monitoring whether treatment is controlling hormone production
- Investigating selected cases of unexplained blood sugar disturbance

Who should have the test

This test is generally reserved for people whose symptoms, examination, scans, or other laboratory results suggest a glucagon-producing tumor. It may also be useful if you already have a pancreatic neuroendocrine tumor or an inherited condition associated with these tumors, such as multiple endocrine neoplasia type 1.

One symptom alone is usually not enough to make the test useful. For example, high blood sugar is common and is much more often caused by diabetes than by excessive glucagon production.

For an investigation of low blood sugar, other measurements taken during an episode are usually more informative. These may include glucose, insulin, C-peptide, proinsulin, ketones, and a screen for medicines that lower blood sugar.

How to prepare

Follow the instructions from the laboratory that will collect your sample. Many laboratories request an overnight fast, often for about eight hours, because food-especially protein and amino acids-can change glucagon levels.

During a fast, you can usually drink plain water. Coffee, tea, juice, and sweetened drinks may affect the result or mean that you are no longer fasting.

Tell the testing team about:

Do not stop prescribed medicine unless the professional arranging the test tells you to. If fasting could be unsafe because you use insulin or another blood-sugar-lowering medicine, ask

for specific instructions beforehand.

Avoid strenuous exercise shortly before the test unless told otherwise. Intense activity can increase glucagon as part of the body's response to increased energy needs.

- Prescription and non-prescription medicines
- Glucagon injections or nasal glucagon used recently
- Vitamins, supplements, and diabetes medicines
- Kidney, liver, pancreatic, or blood sugar conditions
- Pregnancy or possible pregnancy

What happens during the test

A healthcare worker places a needle into a vein, usually in your arm, and collects a small amount of blood. The appointment usually takes less than 10 minutes.

Glucagon breaks down quickly after blood is collected. The sample may need to go into a special tube, be kept cold, and have its plasma separated and frozen promptly. These steps are important because delayed or incorrect processing can produce a misleadingly low result.

You can usually leave and return to normal activities immediately afterward.

Understanding your results

Your report should show your glucagon result and the laboratory's own reference interval. There is no single range that applies to every testing method. Ranges and interpretation vary by laboratory, age, sex, pregnancy status, medicines, and clinical context.

A raised result may support a suspected glucagonoma, particularly when it is clearly elevated on a properly collected fasting sample and fits with other findings. However, a raised level does not prove that a tumor is present. Kidney disease, liver disease, diabetes, pancreatic inflammation, low blood sugar, and physical stress can also increase glucagon.

A result within the laboratory's range makes substantial ongoing glucagon excess less likely. It cannot completely exclude intermittent hormone release, a small tumor, or a problem with sample handling.

Low results are rarely interpreted on their own. A low glucagon concentration does not necessarily mean that your body cannot respond normally to falling blood sugar.

What affects the results

Glucagon is sensitive to both what is happening in your body and how the sample is handled.

Eating can change the result. Protein and amino acids may increase glucagon, while glucose can suppress it. Differences in fasting time can therefore make two results difficult to compare.

Low blood sugar, acute illness, emotional stress, and recent strenuous exercise may raise glucagon. Diabetes can disturb the normal relationship between glucose and glucagon, even when no glucagon-producing tumor is present.

Kidney function matters because reduced kidney function can contribute to higher measured levels. Liver disease may also change glucagon processing. Pancreatitis, meaning inflammation of the pancreas, can produce abnormal results.

Medicines may affect the level directly or by changing blood sugar. Recent treatment with injected or nasal glucagon is especially important to report. Insulin, glucose, somatostatin-like medicines, and some diabetes treatments may also influence interpretation.

Collection and storage are major sources of error. Glucagon can be broken down by enzymes in the blood after collection. Delayed chilling, separation, or freezing may make the reported level lower than it was in your body.

Laboratory methods also differ. Some tests may detect related hormone fragments as if they were glucagon, producing a falsely high result. A recent blood transfusion is not usually a major influence on glucagon, but it should still be mentioned when your wider results are being reviewed.

Accuracy and limitations

There is no single reliable percentage describing how often this test finds or misses a glucagonoma. The answer changes with the laboratory method, sample handling, degree of hormone production, and reason for testing.

The test can miss glucagon excess if secretion is intermittent, the sample is not processed quickly, or the assay has difficulty measuring low concentrations. Repeating a fasting sample under controlled conditions may be more useful than relying on one borderline result.

The test can also report a high level when no glucagonoma is present. Kidney or liver disease, diabetes, pancreatitis, low blood sugar, and cross-reaction with related hormones can all contribute to this.

A blood test shows hormone concentration; it does not show where the hormone comes from. CT, MRI, or endoscopic ultrasound may be better for locating a pancreatic tumor after the laboratory findings have been assessed. Imaging alone is not a substitute for hormone testing because scans can find unrelated pancreatic changes. A tissue biopsy may be needed to identify the type of tumor.

Risks and complications

A blood draw may cause brief pain, a small bruise, or minor bleeding where the needle entered. Some people feel lightheaded or faint, but serious complications are uncommon.

What happens next

A result that is normal or only slightly outside the laboratory's range usually receives routine follow-up. Your healthcare professional may compare it with your symptoms, blood sugar, kidney and liver results, medicines, and any previous measurements.

If the result is unexpected or borderline, the next step may be a repeat fasting test with careful sample handling. A clearly raised result may lead to further blood tests and pancreatic imaging. If you already have a glucagon-producing tumor, repeat measurements may help show how the hormone level changes with treatment, but scans and your overall health remain important.

The glucagon number itself is rarely an emergency. Seek urgent medical help for severe symptoms such as confusion, a seizure, loss of consciousness, chest pain, sudden shortness of breath, or one-sided leg swelling. Less severe ongoing symptoms or an abnormal laboratory result can usually be discussed through routine follow-up.

Common questions

Can I drink coffee before a glucagon blood test?

If you have been told to fast, drink only plain water unless your laboratory gives different instructions. Even black coffee may affect blood sugar and hormone responses.

Does the time of day matter?

A morning sample after an overnight fast is often used to make conditions more consistent. Follow the collection time on your request because repeat results are easier to compare when taken under similar conditions.

Can I exercise beforehand?

Avoid strenuous exercise shortly before the test. Exercise can increase glucagon, especially when it lowers blood sugar or uses substantial stored energy.

Can I take my usual medicines?

Usually, but do not assume. Ask for instructions about insulin and other medicines that lower blood sugar if you must fast. Do not stop any medicine without specific advice.

Why might I need the test repeated?

A repeat may be needed if the result is borderline, does not fit your other findings, or may have been affected by eating, exercise, illness, medicine, or delayed sample processing.

Is this the same as an emergency glucagon injection?

No. The blood test measures glucagon already in your circulation. Emergency glucagon is a medicine given to raise blood sugar during severe hypoglycemia.

Sources

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