TEST

Calcitonin blood test

A calcitonin blood test measures a thyroid-related hormone used mainly to assess and monitor medullary thyroid cancer.

WHAT IT MEASURES
Calcitonin, a hormone made mainly by thyroid C cells

SAMPLE
Blood

FASTING NEEDED?
Sometimes, if the laboratory requests an overnight fast

HOW LONG IT TAKES
About 5 to 10 minutes

RESULTS IN
Usually several days; timing varies by laboratory

USED FOR
Diagnosing and monitoring medullary thyroid cancer

MAIN LIMITATION
Non-cancer conditions and assay interference can alter results

Overview

Calcitonin is a hormone made mainly by specialized thyroid cells called C cells. It helps regulate calcium but is not essential for day-to-day calcium control in most adults.

A calcitonin blood test is used mainly when there is concern about medullary thyroid cancer, or MTC. This uncommon cancer begins in C cells and often releases calcitonin. The test also helps monitor people treated for MTC.

Calcitonin is different from procalcitonin , which may be measured when assessing serious bacterial infection. It is also different from thyroid-stimulating hormone, or TSH, a standard thyroid-function test.

A calcitonin result cannot diagnose cancer by itself. It is interpreted with your medical and family history, examination, imaging, and sometimes genetic testing or a tissue sample.

Why the test is ordered

Your healthcare professional may order the test if a thyroid lump or another finding raises concern about MTC. Routine calcitonin testing for every thyroid nodule is not used consistently because small increases are not specific to cancer.

The test may be ordered to:

Some cases of MTC are linked to changes in the RET gene, including those associated with multiple endocrine neoplasia type 2, or MEN2. Calcitonin testing does not replace RET genetic testing when inherited disease is suspected.

- Investigate a thyroid nodule when MTC is possible
- Establish a baseline before treatment for known MTC
- Check whether calcitonin falls after treatment
- Look for evidence that MTC remains or has returned
- Assess someone from a family affected by inherited MTC

Who should have the test

The test is mainly useful for people with known or suspected MTC and those being monitored after treatment.

It may also be appropriate if a close relative has an inherited RET gene change. Specialists in endocrinology, genetics, or thyroid surgery usually coordinate assessment, which may include genetic testing, calcitonin measurements, and other tests based on the gene change and family history.

Calcitonin is not a general thyroid-function test. It does not usually help diagnose an underactive or overactive thyroid and is not the main blood marker for the more common papillary and follicular thyroid cancers.

How to prepare

Follow the instructions from the laboratory collecting your sample. Many laboratories do not require fasting, while others request an overnight fast because food can cause small changes in calcitonin.

Tell the healthcare professional or laboratory about:

Do not stop prescribed medicines or supplements unless the professional who ordered the test tells you to. If biotin may interfere with the laboratory method, they can advise whether

and when to pause it.

For repeat monitoring, using the same laboratory can make trends easier to interpret because testing methods differ.

- Prescription and non-prescription medicines
- Acid-reducing medicines like omeprazole or lansoprazole , especially proton pump inhibitors
- Biotin supplements, including high-dose hair and nail products
- Kidney disease
- Pregnancy or recent childbirth
- Smoking
- Recent thyroid surgery or treatment

What happens during the test

A healthcare professional places a band around your upper arm, cleans the skin, and inserts a small needle into a vein, usually near the elbow. Blood is collected into a tube.

The blood draw usually takes a few minutes, and you can normally resume your usual activities immediately.

In selected specialist settings, calcitonin may be measured before and after giving a substance that stimulates its release. These stimulation tests are not routinely available, and methods differ between centres.

Understanding your results

Your report should show your result and the laboratory's reference range. Do not compare it with a range found online. Results vary by laboratory method, age, sex, pregnancy status, medicines, kidney function, and clinical context.

A result within range makes a large calcitonin-producing tumour less likely, but it does not completely rule out a small tumour or one that releases little calcitonin.

A raised result does not automatically mean cancer. Mild or moderate increases have several possible causes. Higher results may require more careful investigation for MTC, but no single cutoff answers every case.

After MTC treatment, a very low or undetectable result may suggest that little or no

calcitonin-producing tissue remains. A detectable or rising level may prompt further assessment. Trends across several tests are often more informative than one result.

What affects the results

Factors that can affect calcitonin include:

At extremely high concentrations, some assays may produce an unexpectedly low result, called the hook effect . If a result does not fit the clinical picture, the laboratory can repeat the test after diluting the sample.

Exercise is not usually a major source of interference. Follow any restrictions given by your laboratory.

- Laboratory method: Testing systems use different antibodies and reference ranges.
- Age and sex: Levels are often higher in men and may vary with age.
- Pregnancy and recent childbirth: Hormonal and calcium-related changes may affect results.
- Kidney function: Reduced function can increase calcitonin.
- Smoking: People who smoke may have higher levels.
- Food: Eating may cause a small rise.
- Medicines: Proton pump inhibitors can indirectly increase calcitonin.
- Other conditions: High gastrin levels and some neuroendocrine tumours can raise it.
- Recent thyroid surgery: Early testing may not show the eventual post-treatment level.
- Biotin: High-dose supplements can cause a falsely low result with some assays.
- Antibody interference: Naturally occurring antibodies can occasionally produce falsely high or low results.

Accuracy and limitations

Calcitonin is useful for many medullary thyroid cancers, but a small tumour may not release enough hormone to exceed the laboratory range. Rare tumours release little or no measurable calcitonin, and assay interference can cause falsely low results.

Raised values can also result from kidney disease, smoking, medicines, other hormone-producing tumours, or antibody interference. An unexpected result is therefore

usually confirmed rather than treated as a diagnosis. Repeating the test, using another method, or diluting the sample may help.

Other tests provide different information. Ultrasound shows the structure of the thyroid and neck. A needle biopsy collects cells from a nodule, although MTC can sometimes be difficult to identify from cells alone. Tissue examination confirms the tumour type, while RET genetic testing assesses inherited risk.

Risks and complications

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

What happens next

If your result is within range, you may need no further calcitonin testing or may have repeat measurements as part of planned follow-up.

If it is raised, your healthcare professional may review your medicines, smoking, kidney function, pregnancy status, and recent treatment. They may repeat the test or arrange thyroid ultrasound, a needle biopsy, another marker such as carcinoembryonic antigen, or RET genetic testing.

After treatment for MTC, calcitonin is usually followed over time. A consistent upward trend may lead to imaging for remaining or returning disease.

An abnormal result alone is not usually an emergency. Arrange routine follow-up to discuss it rather than interpreting the number by yourself.

Seek urgent medical assessment for a rapidly enlarging neck swelling or new or worsening trouble swallowing. Call emergency services for severe breathing difficulty. These symptoms need prompt assessment regardless of your calcitonin result.

Common questions

Can I drink coffee before the test?

If told to fast, have only water unless the laboratory says otherwise. If fasting was not requested, follow the instructions on your appointment notice.

Does the time of day matter?

There is no universal requirement. For repeat monitoring, collecting samples under similar conditions at the same laboratory may improve comparisons.

Can I exercise beforehand?

Routine activity is usually acceptable, but follow instructions from your laboratory or specialist.

Does a high calcitonin result mean I have cancer?

No. Non-cancer conditions and testing interference can raise calcitonin. The result usually needs confirmation and interpretation with other findings.

Should I stop biotin or acid-reducing medicine?

Do not stop anything on your own. Tell the person ordering the test what you take so they can advise you.

Why might my repeat result be different?

Fasting, medicines, smoking, kidney function, recent treatment, and the assay used can affect results. A small change may not be medically important, especially if different laboratories performed the tests.

Sources

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