TEST

Parathyroid hormone-related protein blood test

A blood test that helps investigate whether excess PTHrP is causing high calcium levels

WHAT IT MEASURES
Parathyroid hormone-related protein in the blood

SAMPLE
Blood

FASTING NEEDED?
No

HOW LONG IT TAKES
Usually less than 10 minutes

RESULTS IN
Several days, with timing varying by laboratory

USED FOR
Diagnosing the cause of high blood calcium

MAIN LIMITATION
An abnormal result does not identify its cause

Overview

The parathyroid hormone-related protein blood test measures parathyroid hormone-related protein, usually shortened to PTHrP .

PTHrP is made in small amounts by many normal tissues. It has roles in bone development, smooth muscle, pregnancy, and breastfeeding. Some cancers can make much larger amounts. Excess PTHrP can raise the calcium level in your blood by affecting bones and kidneys.

Although its name is similar, PTHrP is not the same as parathyroid hormone, or PTH. PTH is produced by the parathyroid glands in your neck and is a major regulator of calcium. A standard PTH blood test does not measure PTHrP.

The PTHrP test is mainly used to investigate hypercalcaemia , meaning a higher-than-expected blood calcium level. It is not a general cancer screening test and cannot diagnose cancer by itself.

Why the test is ordered

This test may be ordered when blood tests confirm high calcium and your PTH level is low. That pattern suggests that the parathyroid glands are not causing the high calcium.

A high PTHrP result may support a diagnosis of humoral hypercalcaemia of malignancy . This means that a cancer is releasing a substance into the blood that raises calcium. PTHrP is often that substance.

The test may also help distinguish PTHrP-related hypercalcaemia from other causes, such as:

Not everyone with high calcium needs this test. Calcium is usually confirmed first, followed by PTH and other tests chosen according to your medical history.

- Overactive parathyroid glands
- High vitamin D activity
- Certain medicines or supplements
- Bone breakdown from some cancers
- Other kidney, hormone, or inflammatory conditions

Who should have the test

You may be offered a PTHrP test if you have confirmed high calcium, especially when your PTH level is appropriately low or suppressed.

It may also be considered if you have a known cancer and develop unexplained high calcium. However, high calcium in someone with cancer is not always caused by PTHrP.

PTHrP testing is generally not useful for screening people without high calcium. It is also not suitable as a stand-alone test to look for cancer or to determine where a cancer is located.

How to prepare

Fasting is not usually needed. You can normally eat and drink as usual, including drinking water.

Follow the instructions from the laboratory arranging your test. Requirements can differ because laboratories use different collection tubes and testing methods.

Tell your healthcare professional about prescription medicines, over-the-counter products, vitamins, and supplements. Do not stop calcium, vitamin D, or any prescribed medicine unless you have been specifically told to do so.

Also mention if you are pregnant, breastfeeding, or have reduced kidney function. These factors can affect how a result is interpreted.

What happens during the test

A healthcare worker places a small needle into a vein, usually inside your elbow or on the back of your hand. Blood is collected into a tube, and the needle is removed. The appointment generally takes less than 10 minutes.

PTHrP can break down after blood is collected. The laboratory may require the sample to be collected in a particular tube, kept cold, processed quickly, and frozen before testing.

Many hospitals send PTHrP samples to a specialist laboratory. This is why results may take several days or occasionally longer.

Understanding your results

Your result will be shown with the reference range used by the testing laboratory. Do not compare it directly with a range from another laboratory or website.

Ranges and interpretation vary by laboratory and testing method. Age, sex, pregnancy status, medicines, kidney function, and the wider clinical context may also matter.

A high result means that more PTHrP than expected was detected. When this occurs alongside high calcium and low PTH, excess PTHrP may be contributing to the high calcium. The result does not, by itself, prove that cancer is present.

A result within the laboratory range makes PTHrP-driven hypercalcaemia less likely. It does not rule out other cancer-related causes of high calcium. For example, cancer affecting bone can raise calcium without producing measurable excess PTHrP.

Your result needs to be considered with your calcium, albumin, PTH, kidney function, phosphate, and sometimes vitamin D results. Albumin is important because much of the calcium in blood is attached to this protein. An ionised calcium test may be used when a direct measurement of active calcium is needed.

What affects the results

PTHrP testing is unusually sensitive to the type of assay and the way the sample is handled.

Different tests measure different sections, or fragments, of the PTHrP molecule. Results from two assay methods may not be directly comparable. If repeat measurements are needed, using the same laboratory and method can make trends easier to interpret.

Important influences include:

Some non-cancerous conditions have also been associated with increased PTHrP. For this reason, an isolated high result should not be used as a cancer diagnosis.

Eating, coffee, the time of day, and ordinary activity are not considered major direct influences on PTHrP. They may still affect other blood tests collected at the same appointment.

- Kidney function: C-terminal PTHrP fragments can build up in advanced kidney disease, producing a misleadingly high result. An N-terminal PTHrP test may be more useful in this setting.
- Pregnancy and breastfeeding: Placental and breast tissue can produce PTHrP, so results require careful interpretation.
- Sample handling: Delayed processing, the wrong collection tube, or incorrect storage may allow PTHrP to break down and produce a falsely low result.
- Assay interference: Antibodies or other substances in the blood can occasionally interfere with some laboratory methods.
- Testing method: A change in assay can cause an apparent change even when your medical condition has not changed.

Accuracy and limitations

There is no single figure showing how often PTHrP testing is right or wrong in every situation. Performance differs by assay, the fragment being measured, sample handling, kidney function, and the reason for high calcium.

The test can miss a cancer-related cause of hypercalcaemia. Some cancers raise calcium by damaging bone or producing other chemical signals rather than by releasing PTHrP. A degraded or poorly handled sample may also give a result that is lower than it should be.

The test can appear positive when cancer is not the cause. Pregnancy, breastfeeding, advanced kidney disease with some assay types, certain non-cancerous conditions, and laboratory interference can contribute to an increased result.

PTH is usually the better first test for sorting out the cause of confirmed high calcium. If PTH is low, PTHrP, vitamin D-related tests, protein studies, or imaging may be considered based on the overall picture. In advanced kidney disease, an N-terminal PTHrP assay is generally more informative than a C-terminal assay.

Risks and complications

The risks are those of a routine blood draw. You may have brief pain, a small bruise, or minor bleeding where the needle entered.

Some people feel light-headed or faint. Serious complications are uncommon.

What happens next

If the PTHrP result is within range, your healthcare team may look for other causes of high calcium. This may involve repeating calcium, measuring ionised calcium, reviewing medicines and supplements, or ordering PTH, vitamin D, kidney, or protein tests.

If PTHrP is elevated, the result will be checked against your calcium and PTH levels, kidney function, symptoms, and medical history. Further testing is chosen from that information; an elevated PTHrP result alone does not determine which tests or scans you need.

A stable result without severe symptoms can usually be discussed through routine follow-up.

Seek urgent medical advice if high calcium is accompanied by repeated vomiting, worsening dehydration, marked weakness, or increasing drowsiness. Call emergency services for severe confusion, difficulty waking, fainting, chest pain, or a new abnormal heartbeat sensation.

Common questions

Can I drink coffee before the test?

Usually, yes, because fasting is not normally required. If other blood tests are being collected at the same time, follow the preparation instructions for those tests.

Does the time of day matter?

There is no standard requirement to collect PTHrP at a particular time. The laboratory's handling instructions are more important than the time of day.

Can I exercise beforehand?

Ordinary activity is unlikely to change PTHrP significantly. Avoid unusual strenuous exercise if you are also having other tests that may be affected by exercise.

Should I stop calcium or vitamin D supplements?

Not unless a healthcare professional has told you to. Supplements can affect your calcium level and its interpretation, so provide an accurate list of what you take.

Does a high PTHrP result mean I have cancer?

No. It may support a cancer-related cause when calcium is high and PTH is low, but it cannot

diagnose cancer on its own. Kidney disease, pregnancy, breastfeeding, assay interference, and some non-cancerous conditions can affect results.

Can a normal result rule out cancer-related high calcium?

No. Cancer can raise calcium through bone damage or other chemical pathways without increasing PTHrP.

Sources

- Mayo Clinic Laboratories. Parathyroid Hormone-Related Peptide, Plasma . Test use, interpretation, specimen requirements, and assay cautions.
- ARUP Laboratories. Parathyroid Hormone-Related Peptide by LC-MS/MS, Plasma . Collection, processing, and laboratory interpretation information.
- Endotext. Approach to Hypercalcemia . Clinical evaluation of high calcium, including PTH and PTHrP testing.
- Endocrine Society. Treatment of Hypercalcemia of Malignancy in Adults: Clinical Practice Guideline . Evaluation and management context for cancer-related hypercalcaemia.
- Woldemichael JA and colleagues. PTH-Related Protein Assays in Advanced Kidney Disease: Implications for Evaluation of Hypercalcemia . Differences between N-terminal and C-terminal assays in kidney disease.