TEST

Parathyroid hormone (PTH) blood test

A PTH blood test measures a hormone that helps control calcium levels.

WHAT IT MEASURES
Parathyroid hormone, which helps control blood calcium

SAMPLE
Blood

FASTING NEEDED?
No, unless combined tests require fasting

HOW LONG IT TAKES
Usually less than 10 minutes

RESULTS IN
Usually 1-2 days; timing varies by laboratory

USED FOR
Diagnosis and monitoring of calcium and parathyroid disorders

MAIN LIMITATION
Cannot be interpreted without calcium and kidney function

Overview

A parathyroid hormone blood test measures PTH, a hormone made by four small parathyroid glands in your neck. These glands sit near the thyroid but have a different job.

PTH helps keep calcium in your blood within a controlled range. It affects how calcium moves between your bones, kidneys, intestines, and bloodstream. It also affects phosphate and the activation of vitamin D.

PTH is usually measured alongside calcium. A PTH result that appears "normal" may still be inappropriate if your calcium is unusually high or low. Kidney function, vitamin D, magnesium, and phosphate often provide important context.

The test may be called an intact PTH test. Most laboratories use an immunoassay, which measures PTH using antibodies designed to recognize the hormone.

Why the test is ordered

Your healthcare professional may order a PTH test after a blood test finds a high or low

calcium level. The relationship between PTH and calcium can help show whether the parathyroid glands are responding as expected.

The test may help investigate:

PTH may also be monitored after parathyroid surgery or during treatment for an established calcium or parathyroid disorder. In kidney disease, repeated measurements may be used to follow trends rather than relying on one result.

- High or low blood calcium
- Suspected overactive or underactive parathyroid glands
- Kidney disease affecting calcium, phosphate, and bone health
- Vitamin D deficiency or problems absorbing nutrients
- Repeated kidney stones or reduced bone strength when calcium balance may be involved

Who should have the test

PTH testing is not a routine screening test for everyone. It is generally used when symptoms, medical history, or another laboratory result suggests a problem with calcium regulation.

A test may be considered if you have an unexplained abnormal calcium result. It may also be useful if you have chronic kidney disease, certain bone problems, recurrent kidney stones, or previous parathyroid treatment.

Symptoms such as thirst, constipation, muscle cramps, tingling, fatigue, or weakness have many possible causes. They do not show by themselves that you need a PTH test. Your healthcare professional can decide whether calcium, PTH, or another test is appropriate.

How to prepare

You usually do not need to fast for a PTH blood test. However, you may be asked to fast if other tests are being collected at the same time. Follow the instructions from the laboratory or clinic.

Tell the person arranging the test about medicines and supplements you use. Biotin, sometimes called vitamin B7, can interfere with some PTH laboratory methods. It is found in certain hair, skin, and nail supplements and in some multivitamins. Do not stop a prescribed medicine or supplement unless you have been told to do so.

PTH changes during the day. If you are having repeat tests, using a similar collection time can

make the results easier to compare.

Drink water as usual unless you have been given fluid restrictions. Being well hydrated can make the blood draw easier.

What happens during the test

A healthcare professional places a small needle into a vein, usually in your arm. Blood is collected into a tube and sent to a laboratory.

You may feel a brief scratch or sting. The blood draw usually takes less than 10 minutes.

The laboratory must handle the sample correctly because PTH can break down after collection. Depending on the laboratory method, the sample may need prompt separation, cooling, or freezing.

Understanding your results

Interpretation starts with your calcium result. Kidney function, phosphate, magnesium, and vitamin D may also be considered.

Common result patterns include:

A PTH result within the laboratory range is not always reassuring. For example, PTH would normally be suppressed when calcium is high. A value in the middle of the range can therefore be "inappropriately normal."

Do not compare results from different laboratories without checking their methods and ranges. PTH ranges and interpretation vary by laboratory, age, sex, pregnancy status, medicines, and clinical context.

- High calcium with high PTH: PTH may be driving the high calcium
- High calcium with low PTH: The parathyroid glands may be appropriately reducing PTH, so another cause of high calcium may be considered
- Low calcium with high PTH: The glands may be responding to low calcium, vitamin D deficiency, poor absorption, or kidney disease
- Low calcium with low PTH: The glands may not be producing the expected response
- Normal calcium with high PTH: Secondary causes must be assessed before a parathyroid disorder is considered

What affects the results

Several factors can change PTH without meaning that the laboratory made an error.

Kidney function is particularly important. Reduced kidney function can lead to phosphate retention, altered vitamin D activity, and rising PTH. PTH fragments may also collect in the blood and be detected differently by different assays.

Other influences include:

Sample handling also matters. Delayed processing or unsuitable storage can allow PTH to break down and may produce a falsely low result. This is a collection or handling issue rather than a change in your health.

A recent blood transfusion is not usually a major direct influence on PTH, but it may affect calcium temporarily in some settings, especially during a large transfusion. Tell your healthcare team if you have recently received one.

- Vitamin D deficiency or recent vitamin D treatment
- Low calcium intake or reduced absorption from the intestine
- Magnesium abnormalities
- Pregnancy and breastfeeding
- Time of day
- Recent parathyroid or neck surgery
- Medicines affecting calcium or bone, including lithium and some osteoporosis treatments
- Biotin interference with certain laboratory methods
- Differences between PTH testing platforms

Accuracy and limitations

PTH testing is useful, but it cannot identify the cause of an abnormal calcium level by itself. There is no single percentage describing how often it is right or wrong because accuracy differs by assay, cutoff, health condition, and the way the result is interpreted.

The test can appear to say "yes" to a parathyroid problem when PTH is actually elevated because of kidney disease, vitamin D deficiency, low calcium intake, poor absorption, or a medicine. These causes need to be checked before some parathyroid conditions can be confirmed.

It can also miss a problem. PTH may fluctuate, and one result can fall within the laboratory range even when the relationship with calcium is abnormal. Biotin interference or poor sample handling can produce a falsely low result.

Repeat calcium and PTH measurements may be more informative than one test. An ionized calcium test can sometimes be better when blood proteins or acid-base balance may make total calcium misleading. Vitamin D, creatinine or estimated kidney function, phosphate, magnesium, and urine calcium may also be needed.

Ultrasound and other scans do not replace blood testing for diagnosis. They are mainly used to locate an abnormal parathyroid gland after biochemical testing supports a diagnosis.

Risks and complications

A blood draw may cause a small bruise, mild soreness, or brief bleeding. Some people feel light-headed or faint during or shortly after the procedure.

What happens next

A result outside the laboratory range usually needs interpretation rather than immediate treatment. Your healthcare professional may compare it with calcium and kidney function, review medicines and supplements, or arrange repeat testing.

Routine follow-up may include vitamin D, phosphate, magnesium, urine calcium, or bone density testing. If a parathyroid disorder is supported by repeated blood results, you may be referred to an endocrinologist, a specialist in hormone conditions.

Seek urgent medical advice if you have significant new symptoms alongside a known calcium abnormality, such as repeated vomiting, worsening confusion, or marked muscle spasms.

Call emergency services for a seizure, loss of consciousness, severe breathing difficulty, or a serious irregular heartbeat. These symptoms can have many causes and should not be attributed to a PTH result without urgent assessment.

Common questions

Can I drink coffee before a PTH blood test?

Usually, yes, if PTH is the only test being done and you have not been asked to fast. Coffee may not be allowed when fasting tests are collected at the same appointment.

Does the time of day matter?

PTH naturally changes over the day. A single test can still be useful, but repeat samples are easier to compare when collected at a similar time.

Can I exercise beforehand?

Ordinary activity is unlikely to make the test unusable. Strenuous exercise can temporarily affect calcium and related hormones, so avoid an unusually hard workout immediately beforehand if practical.

Should I stop biotin before the test?

Biotin can interfere with some PTH assays. Ask the laboratory or healthcare professional for instructions because the effect depends on the product, amount, and testing method. Do not stop prescribed treatment on your own.

Why were calcium and vitamin D ordered too?

PTH responds to calcium and is closely linked with vitamin D. These results help distinguish a parathyroid problem from an appropriate response to low calcium, vitamin D deficiency, or kidney disease.

Can one abnormal PTH result confirm a diagnosis?

Usually not. Interpretation often requires calcium, kidney function, vitamin D, medicines, symptoms, and sometimes repeat testing.

Sources

- MedlinePlus Medical Test: Parathyroid Hormone Blood Test
- Mayo Clinic Laboratories: Parathyroid Hormone, Serum
- ARUP Consult: Hyperparathyroidism
- Fifth International Workshop: Evaluation and Management of Primary Hyperparathyroidism, Journal of Bone and Mineral Research , 2022
- KDIGO 2017 Clinical Practice Guideline Update for Chronic Kidney Disease-Mineral and Bone Disorder
- US Food and Drug Administration: Biotin Interference with Certain Laboratory Tests