

Intact Parathyroid Hormone (iPTH)

MDL Test Number: 618

Methodology: Immunoassay

CPT Codes: 83970 x 1



Specimen Collection Platform:

Serum in Serum Separator Tube (SST)

Turnaround Time:

24 - 72 hours

Stability:

Room temperature

Test Additions*:

30 days to add tests

Specimen Collection:



1. Immediately after blood collection, invert the tube(s) gently 5 times to ensure mixing of clot activator.



2. Allow the tube to rest upright for at least 30 minutes after collection to ensure proper clotting.



3. Centrifuge for at least 15 minutes at 2200-2500 RPM within one hour of collection.



4. Do not remove the stopper or pour off serum.



What is Intact PTH?

Parathyroid hormone (PTH) is a single-chain hormone of 84 amino acids, made by the four parathyroid glands, which sit behind the thyroid in the neck. Its job is to keep the amount of calcium in the blood within a narrow range. When calcium starts to fall, PTH

is released and acts in three places at once. It moves calcium out of bone into the circulation, tells the kidneys to reabsorb calcium while excreting phosphate, and activates vitamin D so the intestine can absorb more calcium from food. Once calcium has recovered, that recovery signals the parathyroid glands to switch secretion back off.

Whole PTH survives only two to five minutes in the blood before it is broken into smaller pieces. Older tests measured those pieces along with the hormone itself, which made results hard to read. This test measures the intact hormone, so it reflects what the glands are producing now. Levels rise overnight and fall through the morning, which is why the time of the draw matters.

Why test for Intact PTH?

A healthcare provider may order an intact PTH test to measure how much of the hormone is present in the blood. Common reasons include:

- **Working out why a blood calcium level came back high on a routine panel**, the most common reason this test is ordered
- **Investigating primary hyperparathyroidism**, in which one or more parathyroid glands make too much hormone on their own, it is two to three times more common in women and is most often found after menopause
- **Investigating a low blood calcium level**, which can follow thyroid or neck surgery if the parathyroid glands were injured or removed
- **Looking for a treatable cause of thinning bones (osteoporosis)**, where an overactive parathyroid gland is one of the standard things to rule out
- **Following parathyroid function in chronic kidney disease**, where PTH climbs as the kidneys lose the ability to handle calcium and phosphate
- **Helping tell whether a high calcium level in a patient with cancer is coming from the parathyroid glands or from the cancer itself**



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Special Instructions:

- **Collection timing:** PTH rises overnight and drifts down through the morning, so the time of the draw changes the number. The sample should be taken in the morning after 7 a.m., preferably after an overnight fast. The manufacturer notes that drawing after 10 a.m. may separate normal results from mild overactivity of the parathyroid glands more clearly.
- **Biotin supplements:** Biotin, sold on its own as vitamin B7 and included in many hair, skin, and nail products, interferes with this test above the manufacturer's stated threshold of 1500 nanograms per milliliter. No stop-taking interval has been established, so patients should tell the ordering provider about any biotin they take and follow that provider's advice on timing.
- **Comparing results over time:** PTH methods differ from one another, and the same sample can give different numbers on different systems. When results are being tracked over time, use the same test at the same laboratory each time so the comparison is meaningful.

Limitations:

Every laboratory test has limits. For intact PTH, the main ones are:

- A PTH number on its own says very little. The same result can be entirely normal, clearly too high, or clearly too low, depending on the calcium level measured at the same time. A PTH sitting inside the expected range can still be wrong for that patient — too high for a calcium that is already at the top of its range, or too low for a calcium that has fallen.

- Vitamin D status matters in the same way, because a deficiency raises PTH by itself: the parathyroid glands compensate when the intestine cannot absorb enough calcium, and PTH climbs while calcium stays normal. Current guidance is therefore to correct a low vitamin D level before concluding that an unexplained elevation originates in the parathyroid glands themselves.
- This test measures whole PTH, but it also picks up PTH 7-84, a fragment missing the first six amino acids of the molecule, which cross-reacts at 44.8 percent. That fragment accumulates when the kidneys cannot clear it, so results in kidney disease can run higher than the amount of active hormone actually present.
- Triglycerides, bilirubin, and broken-down red blood cells (hemolysis) all push this result down rather than up, and a markedly fatty sample can read at roughly half its true value — enough to make an overactive parathyroid gland look unremarkable. A sample drawn after fasting avoids this.
- A small number of patients carry natural antibodies in their blood — often people who work closely with animals or who have received certain antibody-based treatments — that can interfere with the test and produce an unexpected result.
- This test is intended to help establish why a calcium level is high or low, and is not used to diagnose cancer or to monitor how a cancer is responding to treatment.
- An intact PTH result is one piece of a larger picture. It is meant to be read together with the patient's symptoms, medical history, and other test results — never on its own.

Reference Range(s):

Intact PTH is measured in picograms per milliliter (pg/mL). Unlike most hormones on this menu, it carries a single adult interval. The expected range is identical for women and men and does not shift with age, because the parathyroid glands are regulated by circulating calcium rather than by sex or by the reproductive cycle. The interval below is specific to serum, which is the sample type this laboratory reports:

- **Adults (serum): 12–65 pg/mL (1.3–6.8 pmol/L)**

A result outside these ranges is not automatically a problem, and a result inside them does not rule one out. Only the ordering provider can interpret what a given number means for a given patient. Patients should always go by the reference range printed on their own laboratory report.

Analyte	Disorder	Expected Value*
iPTH	Primary hyperparathyroidism	↑
FiPTH	Secondary hyperparathyroidism	↑↑
iPTH	Vitamin D deficiency	↑
iPTH	Hypoparathyroidism	↓↓

*↓ ↓ – Markedly Decreased, ↑ – Increased, ↑↑ – Markedly Increased.

What are some references that discuss the medical necessity of testing Intact PTH?

1. Bilezikian JP, et al. Evaluation and management of primary hyperparathyroidism: summary statement and guidelines from the Fifth International Workshop. *J Bone Miner Res*, **37**, 2293–2314 (2022).
2. Khan AA, et al. Evaluation and management of hypoparathyroidism: summary statement and guidelines from the Second International Workshop. *J Bone Miner Res*, **37**, 2568–2585 (2022).
3. El-Hajj Fuleihan G, et al. Treatment of hypercalcemia of malignancy in adults: an Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab*, **108**, 507–528 (2023).
4. Kidney Disease: Improving Global Outcomes (KDIGO) CKD-MBD Update Work Group. KDIGO 2017 clinical practice guideline update for the diagnosis, evaluation, prevention, and treatment of chronic kidney disease–mineral and bone disorder (CKD-MBD). *Kidney Int Suppl*, **7**, 1–59 (2017).
5. Demay MB, et al. Vitamin D for the prevention of disease: an Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab*, **109**, 1907–1947 (2024).



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