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## Calcium - ionized

Ionized calcium is calcium in your blood that is not attached to proteins. It is also called free calcium.

All cells need calcium in order to work. Calcium helps build strong bones and teeth. It is important for heart function. It also helps with muscle contraction, nerve signaling, and blood clotting.

This article discusses the test used to measure the amount of ionized calcium in blood.

### How the Test is Performed

A blood sample is needed. Most of the time blood is drawn from a vein located on the inside of the elbow or the back of the hand.

### How to Prepare for the Test

Many medicines can interfere with blood test results.

- Your health care provider will tell you if you need to stop taking any medicines before you have this test.
- DO NOT stop or change your medicines without talking to your provider first.

### Why the Test is Performed

Your provider may order this test if you have signs of bone, kidney, liver or parathyroid disease. The test may also be done to monitor progress and treatment of these diseases.

Most of the time, blood tests measure your total calcium level. This looks at both ionized calcium and calcium attached to proteins. You may need to have a separate ionized calcium test if you have factors that increase or decrease total calcium levels. These may include abnormal blood levels of albumin or immunoglobulins.

### Normal Results

Results generally fall in these ranges:

- Children: 4.8 to 5.3 milligrams per deciliter (mg/dL) or 1.20 to 1.32 millimoles per liter (millimol/L)
- Adults: 4.8 to 5.6 mg/dL or 1.20 to 1.40 millimol/L

Normal value ranges may vary slightly among different laboratories. Talk to your provider about the meaning of your specific test results.

The examples above show the common measurements for results for these tests. Some laboratories use different measurements or may test different specimens.

## What Abnormal Results Mean

Higher-than-normal levels of ionized calcium may be due to:

- Decreased levels of calcium in the urine from an unknown cause (also called hypocalciuria)
- Hyperparathyroidism
- Hyperthyroidism
- Milk-alkali syndrome
- Multiple myeloma
- Paget disease
- Sarcoidosis
- Thiazide diuretics
- Thrombocytosis (high platelet count)
- Tumors
- Vitamin A excess
- Vitamin D excess

Lower-than-normal levels may be due to (or caused by):

- Hypoparathyroidism
- Malabsorption
- Osteomalacia
- Pancreatitis
- Renal failure
- Rickets
- Vitamin D deficiency

## Alternative Names

Free calcium; Ionized calcium

## References

Bringhurst FR, Demay MB, Kronenberg HM. Hormones and disorders of mineral metabolism. In: Melmed S, Auchus, RJ, Goldfine AB, Koenig RJ, Rosen CJ, eds. *Williams Textbook of Endocrinology*. 14th ed. Philadelphia, PA: Elsevier; 2020:chap 29.

Klemm KM, Klein MJ, Zhang Y. Biochemical markers of bone metabolism. In: McPherson RA, Pincus MR, eds. *Henry's Clinical Diagnosis and Management by Laboratory Methods*. 24th ed. Philadelphia, PA: Elsevier; 2022:chap 16.

Thakker RV. The parathyroid glands, hypercalcemia, and hypocalcemia. In: Goldman L, Schafer AI, eds. *Goldman-Cecil Medicine*. 26th ed. Philadelphia, PA: Elsevier; 2020:chap 232.

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