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Medical Encyclopedia: Serum calcium

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Alternative names

Ca+2; Calcium - serum; Ca++

Definition

Serum calcium is a blood test to measure the amount of calcium in the blood. Serum calcium is usually measured to screen for or monitor bone diseases or calcium-regulation disorders (diseases of the parathyroid gland or kidneys).

How the test is performed

Blood is drawn from a vein, usually from the inside of the elbow or the back of the hand. The puncture site is cleaned with antiseptic. An elastic band is placed around the upper arm to apply pressure and cause the vein to swell with blood.

A needle is inserted into the vein, and the blood is collected in an air-tight vial or a syringe. During the procedure, the band is removed to restore circulation. Once the blood has been collected, the needle is removed, and the puncture site is covered to stop any bleeding.

For an infant or young child, the area is cleansed with antiseptic and punctured with a sharp needle or a lancet. The blood may be collected in a pipette (small glass tube), on a slide, onto a test strip, or into a small container. A bandage may be applied to the puncture site if there is any bleeding.

How to prepare for the test

Drugs that can cause increased measurements in this test include calcium salts (for example, in nutritional supplements or antacids), vitamin D, lithium, thiazide diuretics, and thyroxine. Consult your health care provider regarding the need to discontinue drugs that may affect this test.

How the test will feel

When the needle is inserted to draw blood, some people feel moderate pain, while others feel only a prick or stinging sensation. Afterward, there may be some throbbing.

Why the test is performed

All cells require calcium to function. Calcium is especially important in the structure of bones and in neuromuscular (nerves and muscles) activity. A deficiency of calcium in the body fluids causes hyperexcitable nerves and muscles. Excess calcium has the opposite effect.

Normal Values

Normal values range from 8.5 to 10.2 mg/dL. Normal value ranges may vary slightly among different laboratories.

What abnormal results mean

Abnormal results indicate the following:

Higher-than-normal levels may indicate:

- Hyperparathyroidism
- Metastatic bone tumor
- Milk-alkali syndrome
- Multiple myeloma
- Paget's disease
- Sarcoidosis
- Tumors producing a PTH-like substance
- Vitamin D intoxication
- Excessive calcium intake
- Prolonged immobilization
- Hyperthyroidism (overactive thyroid gland)
- Addison's disease (underactive adrenal gland)
- Thiazide diuretics
- Lithium
- HIV/AIDS

Lower-than-normal levels may indicate:

- Hypoparathyroidism
- Malabsorption (inadequate absorption of nutrients from the intestinal tract)
- Osteomalacia
- Pancreatitis
- Renal failure
- Rickets and vitamin D deficiency
- Liver disease (decreased albumin production)
- Low serum magnesium

Additional conditions under which the test may be performed:

- Delirium
- Dementia
- Multiple endocrine neoplasia (MEN) II
- Multiple endocrine neoplasia (MEN) I
- Renal cell carcinoma
- Secondary hyperparathyroidism

What the risks are

- Excessive bleeding
- Fainting or feeling lightheaded
- Hematoma (blood accumulating under the skin)
- Infection (a slight risk any time the skin is broken)
- Multiple punctures to locate veins

Special considerations

Drinking too much milk or taking too much vitamin D as a dietary supplement can increase calcium levels.

Veins and arteries vary in size from one patient to another and from one side of the body to the other. Obtaining a blood sample from some people may be more difficult than from others.

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