



## Estimation of Serum Calcium

Calcium (  $\text{Ca}^{2+}$  ) :- is one of the essential chemical elements of the body. Body cells, especially the brain, muscles and heart, need a healthy level of calcium in the blood to function properly. Calcium reaches the body through the food we eat and is absorbed from the digestive system into the body, where part of the calcium in the blood enters the cells

Calcium is stored in the teeth and bones while excess amounts are secreted into the urine. Calcium levels are controlled by several hormones, especially Parathyroid Hormone (PTH).

Almost all of your body's calcium is stored in your bones and teeth 99%. A very small amount about 1% is in your blood.

### Calcium in your blood comes in two forms:

- **Free calcium** is not attached to anything else in your blood.
- **Bound calcium** is attached to a **protein** called albumin or other substances in your blood.

There are two levels of calcium in the blood: **total calcium** and **ionized calcium**.

50% of the total calcium in the body is linked to albumin (a blood protein), and therefore can change the level of total calcium in the blood at high or low level of albumin.



## **There are two types of blood calcium tests:**

- ❖ A total calcium test measures both free and bound calcium. It's the type of blood calcium test doctors order most often.
- ❖ An ionized calcium test measures only free calcium.

## **The roles of calcium**

1. Blood Coagulation .
2. Cofactor .
3. Maintenance of normal muscle contraction .
4. Transmission of nerve impulses.

\*\*\*The real reduction of calcium ion caused tetany .

## **Clinical Significance**

### **Causes Hyper clacium**

High total calcium levels can be caused by:

1. Overactive parathyroid or thyroid gland
2. Cancer
3. Tuberculosis -- a lung disease caused by bacteria
4. Staying in bed for too long
5. Too much vitamin D in your diet
6. Kidney transplant
7. AIDS



## Symptoms of Hyper calcium

1. No desire to eat
2. Constipation
3. Always tired
4. Intense thirst
5. Nausea
6. Stomach pain
7. Vomiting
8. Weakness

## Causes Hypo calcium

Low total calcium levels may be caused by:-

1. Low protein levels in your blood
2. Underactive parathyroid gland
3. low levels of magnesium and/or vitamin D in body
4. Too much phosphorus
5. Pancreatitis
6. Kidney failure

## Symptoms of hypo calcium

1. Irregular heartbeat
2. Muscle cramps or spasms
3. Tingling in your hands or feet
4. Muscle pain.

**Normal value :- 8 - 12.2 mg/dL**