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Medical Encyclopedia: Serum sodium

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Alternative names

Sodium - serum; Na+

Definition

This test measures the amount of sodium in the blood.

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, and a band is placed around the upper arm to apply pressure and restrict blood flow through the vein. This causes the veins below the band to swell with blood.

A needle is inserted into the vein, and the blood is collected in an airtight 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.

Because 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 one person may be more difficult than from another.

In infants or young children, the area is cleansed with antiseptic and punctured with a sharp needle or lancet. The blood may be collected in a small glass tube (pipette), on a slide, onto a test strip, or into a small container. If bleeding does not quickly stop, a cotton pad or bandage may be applied to the puncture site.

How to prepare for the test

Your health care provider may advise you to withhold any medications you are taking that can affect the test (see Special Considerations.) DO NOT, however, stop or change your medications without your doctor's knowledge.

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

This test will be performed if you have symptoms of sodium imbalance or disorders associated with abnormal sodium levels.

The level of sodium in your blood is a balance between the sodium in the food and drinks you consume and the amount in urine. In addition, a small percent is lost through stool and sweat.

Many factors affect sodium levels, including the hormone aldosterone, which reduces sodium loss in the urine (aldosterone test.) ANP (atrial natriuretic protein), a hormone secreted from the heart, increases sodium loss from the body.

Despite the tight relationship between sodium and water, the body can controls each one separately.

Normal Values

The normal range of sodium is 135 to 145 mEq/L (milliequivalents per liter).

What abnormal results mean

Higher-than-normal sodium levels may indicate many different conditions. To help determine the cause, your health care provider will consider the total amount of fluid in your body. This is done during a physical exam by looking at the turgor of your skin and swelling in the ankles, feet, and legs.

- If the amount of fluid in your body (total body water) is low, you may have lost water due to excessive sweating, diarrhea, use of diuretics (for example, furosemide, bumetanide, or torsemide), or burns.
- If your total body water is normal, high sodium levels may indicate diabetes insipidus or too little of the hormone vasopressin.
- If your total body water is high, this may indicate hyperaldosteronism (too much of the hormone aldosterone), Cushing's syndrome (too much of the hormone cortisol), or too much salt or sodium bicarbonate ingestion.

Lower-than-normal sodium levels also may be classified according to total body water:

- Low total body water may indicate dehydration, vomiting, diarrhea, over diuresis, or ketonuria (excretion or loss of ketone bodies in urine).
- Near-normal total body water may indicate SIADH, too much of the hormone vasopressin, underactive thyroid (hypothyroidism), or Addison's disease (low production of cortisol and other hormones).
- An increase in total body water may indicate congestive heart failure, nephrotic syndrome or other kidney disease, or cirrhosis of the liver.

Additional conditions for which the test may be performed include:

- Acute adrenal crisis
- Diabetic hyperglycemic hyperosmolar coma
- Drug-induced hypothyroidism
- Hepatorenal syndrome
- Hypopituitarism

What the risks are

Possible risks from any blood test include:

- 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

The following factors can interfere with the a test for sodium levels:

- Recent trauma, surgery, or shock
- Consuming large or small amounts of salt or fluid
- Intravenous fluids containing sodium
- Diuretics or certain other medications

Drugs that can increase sodium levels include anabolic steroids, antibiotics, clonidine, corticosteroids, cough medications, laxatives, methyldopa, nonsteroidal anti-inflammatory drugs (NSAIDs), and birth control pills.

Drugs that can reduce sodium levels include carbamazepine, diuretics, sulfonylureas, triamterene, and vasopressin.

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