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Medical Encyclopedia: TSH

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Alternative names

Thyrotropin; Thyroid stimulating hormone

Definition

TSH is a test that measures the amount of the hormone TSH in the blood.

How the test is performed

Adult or child:

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 tourniquet is placed around the upper arm to apply pressure and restrict blood flow through the vein. This causes veins below the tourniquet to fill with blood. A needle is inserted into the vein, and the blood is collected in an air-tight vial or a syringe. The tourniquet is then removed to restore circulation. After blood has been collected the needle is removed, and the puncture site is covered to stop any bleeding.

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

No special preparation is usually necessary.

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

TSH is measured as a screening test for abnormal thyroid function (either hyperthyroidism or hypothyroidism). It is also measured to monitor treatment of these conditions. The test is also done in infertile females, to check if thyroid disease is the cause of infertility.

TRH, a hormone produced in the hypothalamus, stimulates the pituitary gland to release TSH. TSH subsequently stimulates the thyroid to produce thyroid hormones, T3 and T4. These hormones feedback to the hypothalamus and pituitary to regulate the release of both TSH and TRH.

In certain diseases, this regulation pathway is altered, leading to under- or over-production of thyroid hormone. When a thyroid disorder is suspected clinically, a TSH level is obtained as an initial test.

Normal Values

Normal values are from 0.4 to 4.0 mIU/L for those with no symptoms of an under- or over-active thyroid.

If you are being treated for a thyroid disorder, your TSH should be between 0.5 and 2.0 mIU/L. This means that you are being treated appropriately.

Some people with a TSH value over 2.0 mIU/L, who have no signs or symptoms suggestive of an under-active thyroid, may develop hypothyroidism sometime in the future. Anyone with a TSH above 2.0 mIU/L, therefore, should be followed very closely by a doctor.

Normal value ranges may vary slightly among different laboratories.

What abnormal results mean

Greater-than-normal levels may indicate:

- Congenital hypothyroidism (cretinism)
- Primary hypothyroidism
- TSH-dependent hyperthyroidism
- Thyroid hormone resistance
- Exposure to mice (lab workers or veterinarians)

Lower-than-normal levels may indicate:

- Hyperthyroidism
- TSH deficiency
- Medications (dopamine agonists, glucocorticoids, somatostatin analogues, bexarotene)

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

Drugs that can affect TSH measurements include: antithyroid medications, lithium, potassium iodide, amiodarone, dopamine and prednisone.

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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