TEST

TSH test

A TSH test is a blood test measuring the pituitary signal that controls thyroid hormone production.

WHAT IT MEASURES
Thyroid-stimulating hormone, which signals the thyroid to make hormones

SAMPLE
Blood from a vein

FASTING NEEDED?
No, unless other tests require fasting

HOW LONG IT TAKES
Usually less than ten minutes

RESULTS IN
Usually one to two days; timing varies by laboratory

USED FOR
Screening, diagnosis, and monitoring of thyroid problems

MAIN LIMITATION
Illness, medicines, pregnancy, and pituitary disease can mislead interpretation

Overview

A TSH test measures thyroid-stimulating hormone in your blood. TSH is made by the pituitary gland, a small gland at the base of the brain.

TSH tells your thyroid gland to make the hormones thyroxine, called T4, and triiodothyronine, called T3. These hormones affect energy use, body temperature, heart rate, digestion, and many other body functions.

The pituitary gland adjusts TSH according to the amount of thyroid hormone circulating in your blood. When thyroid hormone falls, TSH usually rises. When thyroid hormone rises, TSH usually falls.

TSH is often the first blood test used to assess thyroid function. It may be tested with free T4, which measures the portion of T4 available for your body to use. Sometimes free T3 and thyroid antibody tests are added.

Why the test is ordered

A TSH test can help investigate whether your thyroid is underactive or overactive. It is also used to monitor thyroid conditions and treatment.

It may be ordered to:

Many symptoms linked with thyroid conditions have other possible causes. A TSH result is interpreted alongside your symptoms, examination, medical history, and other test results.

- Investigate symptoms that could be related to thyroid function
- Follow up an enlarged thyroid gland or thyroid nodule
- Monitor treatment with thyroid hormone replacement
- Monitor treatment for an overactive thyroid
- Check thyroid function during pregnancy or pregnancy planning
- Assess thyroid function when another condition or medicine may affect it
- Follow up an earlier TSH result outside the laboratory range

Who should have the test

You may be offered testing if you have symptoms or physical findings that could suggest a thyroid problem. These can include an unexplained change in weight, heat or cold intolerance, changes in heart rate, bowel changes, menstrual changes, neck swelling, or persistent changes in energy.

Testing may also be appropriate if you have a higher chance of thyroid disease because of autoimmune disease, previous thyroid treatment, pituitary disease, pregnancy, certain medicines, or a family history.

Recommendations about routine screening in people without symptoms differ between countries and healthcare systems. Testing is not automatically needed for everyone.

Babies may have TSH measured as part of newborn screening. This uses a different testing pathway and age-specific interpretation.

How to prepare

You usually do not need to fast. You can normally eat and drink as usual unless your blood sample is being used for other tests that require fasting.

Tell the person arranging the test about prescription medicines, over-the-counter products, vitamins, and supplements. Biotin, also called vitamin B7, can interfere with some laboratory methods. It is found in some hair, skin, and nail supplements.

Do not stop prescribed medicine or thyroid treatment unless you have been given specific instructions. If you take thyroid hormone, ask whether the sample should be collected before or after your daily dose. Keeping the timing consistent can make monitoring results easier to compare.

Also mention pregnancy, recent serious illness, and any recent changes to thyroid medicine.

What happens during the test

A healthcare professional usually takes blood from a vein in your arm. They clean the skin, insert a small needle, and collect the blood into a tube.

You may feel a brief scratch or sting. The blood draw usually takes less than ten minutes, although the full appointment may take longer.

The sample is sent to a laboratory for analysis. Results are often available within one or two days, but turnaround time varies by laboratory and care setting.

Understanding your results

Your result should be compared with the reference range printed on your laboratory report. Ranges and interpretation vary by laboratory, age, sex, pregnancy status, medicines, and clinical context.

A TSH result cannot always be interpreted by itself.

A high TSH often means the pituitary gland is sending a stronger signal because the thyroid is not making enough hormone. If free T4 is also low, this pattern can support an underactive thyroid. If free T4 remains within range, the meaning is less certain and repeat testing may be appropriate.

A low TSH often means the pituitary gland is reducing its signal because there is more thyroid hormone in the blood. Free T4 and sometimes free T3 help clarify whether the thyroid is overactive.

There are important exceptions. If the pituitary gland or nearby brain structures are not working normally, TSH may be low or apparently normal even when free T4 is low. In this situation, TSH alone can miss an underactive thyroid.

A result just outside the reference range does not always mean you have a thyroid condition. Small changes can be temporary or related to medicines, illness, pregnancy, or normal biological variation.

What affects the results

Several factors can change TSH without a permanent thyroid disorder being present:

If a result does not fit how you feel or conflicts with other thyroid tests, repeating it with another laboratory method may help.

- Acute illness: Serious or recent illness can temporarily alter TSH and thyroid hormone levels
- Pregnancy: TSH changes during pregnancy, especially early pregnancy, so pregnancy-specific interpretation is needed
- Age: TSH patterns and appropriate interpretation can change with age
- Time of day: TSH follows a daily rhythm and is generally higher overnight
- Thyroid medicine: Missed doses, recent dose changes, and timing around the blood draw can affect results
- Other medicines: Amiodarone, lithium, glucocorticoids, dopamine-related medicines, and some cancer treatments can affect thyroid function or TSH
- Biotin supplements: High biotin intake can produce misleading results in some test systems, often making TSH appear lower
- Recent thyroid treatment: Surgery, radioactive iodine, or treatment for an overactive thyroid can leave TSH slow to adjust
- Laboratory interference: Unusual antibodies in the blood can rarely interfere with the test and produce an unexpected result

Accuracy and limitations

TSH is a useful first test for common thyroid problems that begin in the thyroid gland. In a stable person, a clearly abnormal result combined with free T4 often gives reliable information.

However, TSH can miss thyroid hormone deficiency caused by pituitary or hypothalamic disease. Free T4 is more important when this is suspected.

The test can also suggest a problem when thyroid function is actually recovering from illness

or being affected by medicine, pregnancy, or test interference. Mildly abnormal results are therefore often checked again before long-term decisions are made.

TSH does not show the cause of a thyroid problem. Thyroid antibody tests, imaging, or other blood tests may be needed. Ultrasound examines the thyroid's structure, but it does not replace blood tests for measuring thyroid function.

Risks and complications

A blood draw may cause brief discomfort, a small bruise, or minor bleeding where the needle entered. Some people feel light-headed or faint, but serious complications are uncommon.

What happens next

If your TSH is within the laboratory range and there are no other concerns, you may not need further testing.

An unexpected result is often followed by free T4, and sometimes free T3 or thyroid antibody tests. Your healthcare professional may repeat TSH after allowing time for a temporary illness to settle or for a medicine change to take effect. TSH adjusts over weeks, so repeating it too soon may not show the full effect.

If you already take thyroid medicine, the result may be used to decide whether your treatment needs review. Do not change your dose based only on a result without discussing it with the clinician managing your prescription.

Most abnormal TSH results can be followed up routinely. Seek urgent medical help if you have severe shortness of breath, chest pain, fainting, new confusion, extreme drowsiness, or a very fast or irregular heartbeat. These symptoms require prompt assessment regardless of your TSH result.

Common questions

Can I drink coffee before a TSH test?

Usually, yes. Coffee does not require you to fast for TSH alone. If you take thyroid hormone in the morning, coffee can affect how the medicine is absorbed, so follow your usual medication and testing instructions.

Does the time of day matter?

TSH changes during the day. This usually does not prevent routine testing, but collecting repeat samples at a similar time can help when results are borderline or being closely monitored.

Can I exercise beforehand?

Ordinary activity is unlikely to cause a meaningful problem. Very strenuous exercise can temporarily affect some hormone measurements, particularly if it causes physical stress or dehydration. Mention unusually intense exercise if your result is unexpected.

Should I take my thyroid tablet before the test?

Follow the instructions from the service arranging the test. Taking levothyroxine shortly before blood collection can temporarily raise free T4, while TSH changes more slowly. Consistent timing is especially useful for monitoring.

Do I need to stop biotin?

Biotin can interfere with some thyroid test methods. Tell the laboratory or clinician how much you take and when you last took it. Do not stop a prescribed supplement without advice.

What if my TSH is only slightly outside the range?

A small difference may be temporary or reflect normal variation. The result is usually considered with free T4, symptoms, medicines, pregnancy status, and previous results. Repeat testing may be more informative than a single measurement.

Sources

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