TEST

# Thyroid peroxidase antibody

A blood test that checks for antibodies linked with autoimmune thyroid disease.

**WHAT IT MEASURES**
Antibodies targeting a thyroid hormone-making enzyme

**SAMPLE**
Blood

**FASTING NEEDED?**
No

**HOW LONG IT TAKES**
Usually less than 10 minutes

**RESULTS IN**
Usually 1 to 3 days, varying by laboratory

**USED FOR**
Supporting diagnosis of autoimmune thyroid disease

**MAIN LIMITATION**
A positive result does not prove thyroid dysfunction

## Overview

A thyroid peroxidase antibody test looks for antibodies against thyroid peroxidase, often shortened to TPO. Thyroid peroxidase is an enzyme that helps your thyroid gland make thyroid hormones.

Antibodies are proteins made by the immune system. Thyroid peroxidase antibodies, or TPO antibodies, may appear when the immune system mistakenly targets the thyroid. This is called autoimmune thyroid disease.

The test can support a diagnosis of Hashimoto's thyroiditis, a common autoimmune cause of an underactive thyroid. TPO antibodies may also be found in Graves' disease, postpartum thyroiditis and some people whose thyroid is working normally.

The result cannot show how well your thyroid is working. For that, the main tests are thyroid-stimulating hormone, or TSH, and free thyroxine, usually called free T4.

## Why the test is ordered

A clinician may order this test to help explain an abnormal TSH or free T4 result. It can help distinguish autoimmune thyroid disease from other causes of thyroid dysfunction.

The test may also be used when you have an enlarged thyroid, called a goitre, or symptoms that could be related to thyroid hormone levels. These symptoms have many possible causes, so antibody testing is usually considered alongside your examination and other blood tests.

During pregnancy, TPO antibodies may sometimes help with interpreting an abnormal TSH result or assessing the need for follow-up. The antibody result alone does not determine whether treatment is needed.

TPO antibody levels are generally not useful for checking whether thyroid treatment is working. Antibody concentrations can remain raised or change over time without matching your symptoms or thyroid hormone levels.

## Who should have the test

This test may be appropriate if you have:

It is not usually a stand-alone screening test for everyone. A positive result can occur in someone with normal thyroid function, so testing without a clear clinical reason may lead to unnecessary concern or repeat testing.

Whether the test is useful depends on your symptoms, medical history, pregnancy status, examination and previous thyroid results.

- A raised TSH or another unexplained thyroid test result
- A goitre or signs of thyroid inflammation
- Suspected Hashimoto's thyroiditis
- A thyroid problem during pregnancy or after giving birth
- Another autoimmune condition alongside possible thyroid dysfunction

## How to prepare

You do not usually need to fast. You can eat, drink water and take most regular medicines as normal unless you have been given different instructions for other blood tests being collected at the same time.

Tell the clinician or laboratory about vitamins and supplements, especially biotin. Biotin is found in some hair, skin and nail products and in high-dose supplements. It can interfere with

certain laboratory testing systems, although the effect on a TPO antibody result depends on the assay used.

Do not stop biotin, thyroid medicine or any prescribed treatment without instructions from the clinician who arranged the test. Also mention pregnancy, recent intravenous immunoglobulin treatment or a recent blood transfusion because these can affect how some antibody results are interpreted.

## What happens during the test

A healthcare professional usually takes blood from a vein in your arm. A band is placed around your upper arm, the skin is cleaned and a small needle is inserted into the vein.

The blood is collected into a tube and sent to a laboratory. The blood draw itself usually takes only a few minutes.

You can normally leave immediately and continue your usual activities.

## Understanding your results

Laboratories commonly report the result as positive or negative, or as a number with a laboratory-specific cut-off. Numbers are often expressed in international units per millilitre, but testing methods and reporting formats differ.

Reference ranges and interpretation vary by laboratory, age, sex, pregnancy status, medicines and clinical context. Use the range printed on your own report rather than comparing your number with one found elsewhere.

A positive result means TPO antibodies were detected above the laboratory's cut-off. This supports an autoimmune cause when TSH, free T4, symptoms and examination findings also point in that direction. It does not by itself prove that your thyroid is underactive or overactive.

A positive result with normal TSH and free T4 means your thyroid may currently be working normally. Some people remain well, while others develop thyroid dysfunction later. The need and timing for follow-up depend on factors such as symptoms, pregnancy plans and previous TSH results.

A negative result makes TPO-antibody-associated thyroid disease less likely, but does not completely rule it out. Some people with autoimmune thyroiditis do not have detectable TPO antibodies. Other causes of abnormal thyroid function also need to be considered.

The size of the antibody number does not reliably show how severe a thyroid condition is or

how much medicine someone might need.

## What affects the results

The most important influence is the laboratory method. Different assays use different materials and cut-offs, so results from separate laboratories may not be directly comparable.

Other factors include:

Levothyroxine and other thyroid medicines affect thyroid hormone and TSH results more directly than they affect the meaning of a TPO antibody result. Do not change your dose based on the antibody number.

- Biotin: High-dose supplements can distort some immunoassays, depending on the testing system
- Pregnancy: Immune changes can lower antibody concentrations during pregnancy, followed by a rise after birth
- Age and sex: Antibody detection patterns differ across population groups
- Immune treatments: Medicines that suppress or alter immune activity may change antibody levels
- Intravenous immunoglobulin: Donor antibodies can temporarily complicate antibody testing
- Recent transfusion: This is usually not important, but certain blood products may rarely transfer antibodies
- Natural fluctuation: TPO antibody levels can rise or fall without a matching change in thyroid function

## Accuracy and limitations

There is no single accuracy figure for this test. How often it gives the right answer differs by laboratory method, the cut-off used and the group being tested.

The test can miss autoimmune thyroid disease. Some people with clinical and laboratory features of Hashimoto's thyroiditis have no measurable TPO antibodies. A negative result therefore cannot fully exclude it.

The test can also say "positive" when the person has no current thyroid dysfunction. TPO antibodies may be found in people with normal TSH and free T4, and in people with other

autoimmune conditions. This is not necessarily a laboratory error; it reflects the fact that antibodies and thyroid function are not the same thing.

Other tests may answer the clinical question better. TSH and free T4 show how the thyroid is functioning. Thyrotropin receptor antibody testing is more specific when Graves' disease is suspected. Ultrasound is more useful for examining a thyroid lump, enlargement or structural change.

Repeating TPO antibody levels usually adds less information than following TSH and free T4.

## Risks and complications

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

## What happens next

Your result is usually reviewed with your TSH, free T4, symptoms and medical history. A positive antibody result with normal thyroid function may lead to routine follow-up rather than treatment.

If thyroid function is abnormal, the next step may be repeat blood testing, treatment discussion or further assessment. Pregnancy or plans to become pregnant can affect how quickly follow-up is arranged.

A positive TPO antibody result by itself is not an emergency. Arrange routine review if you are well and need help understanding the report.

Seek prompt medical advice if you are pregnant and have abnormal thyroid function results, or if you develop a rapidly enlarging neck swelling or increasing difficulty swallowing. Seek emergency care for trouble breathing, severe chest pain, fainting or new confusion; these symptoms require immediate assessment regardless of the antibody result.

## Common questions

Can I drink coffee before the test?

Yes. Coffee does not usually affect a TPO antibody test. If other fasting blood tests are being collected, follow the instructions given for those tests.

Does the time of day matter?

Not usually for TPO antibodies. TSH can change somewhat during the day, so timing may matter when comparing repeated thyroid function tests.

Can I exercise beforehand?

Normal activity is unlikely to affect the result. There is usually no need to avoid exercise specifically for a TPO antibody test.

Should I stop biotin before the test?

Ask the laboratory or clinician who arranged the test. Biotin affects some laboratory systems, but instructions differ according to the dose and assay. Do not stop prescribed supplements without advice.

Does a positive result mean I have Hashimoto's disease?

Not by itself. A positive result supports an autoimmune explanation, but diagnosis also uses TSH, free T4, symptoms and other clinical information.

Will I need the test repeated?

Usually not. Once TPO antibodies have been identified, repeating the antibody level often does not change care. Thyroid function tests are generally more useful for follow-up.

## Sources

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