TEST

Antithrombin III blood test

A blood test that measures a clot-controlling protein to help identify antithrombin deficiency.

WHAT IT MEASURES
Antithrombin activity or amount, a natural blood-clotting brake

SAMPLE
Blood

FASTING NEEDED?
No

HOW LONG IT TAKES
About five minutes for the blood draw

RESULTS IN
Often several days, depending on the laboratory

USED FOR
Diagnosing deficiency and sometimes monitoring antithrombin treatment

MAIN LIMITATION
Acute clots and anticoagulants can mislead results

Overview

Antithrombin is a protein made mainly by the liver that helps prevent excessive blood clotting. It blocks several clotting proteins, including thrombin and factor Xa.

Although the test is often called an antithrombin III test, the protein is now usually called simply antithrombin .

An antithrombin activity test checks how well the protein works. An antithrombin antigen test measures how much is present. Activity is usually tested first; if it is low, an antigen test may help explain the result.

Low antithrombin can be inherited or acquired through liver, kidney, clotting, or inflammatory conditions. One low result does not establish the cause.

Why the test is ordered

The test may be used after a blood clot, particularly if it occurred at a young age, happened

more than once, developed in an unusual blood vessel, or was accompanied by a strong family history.

It may also be ordered when heparin, an anticoagulant, appears not to be working as expected. Heparin relies partly on antithrombin to slow clotting.

Other reasons include:

Antithrombin testing is not routine screening and is not automatically useful after every blood clot because the result may not change treatment.

- Confirming an unexpectedly low result
- Distinguishing inherited deficiency from an acquired low level
- Monitoring antithrombin replacement in selected hospital settings
- Assessing relatives after inherited deficiency is confirmed in a family

Who should have the test

You may be offered testing if your medical and family history suggests that antithrombin deficiency could affect your care. This may include repeated venous clots, such as deep vein thrombosis or pulmonary embolism, especially when close relatives have had similar problems.

Testing relatives may be considered when a specific inherited deficiency has been found in the family. The possible benefits and effects on future medical decisions should be discussed first.

Timing matters. An acute clot, serious illness, pregnancy, or anticoagulant treatment may produce a misleading result. When possible, testing is delayed until the immediate illness has settled.

How to prepare

You do not normally need to fast. You can eat, drink water, and have coffee unless other tests at the same appointment require fasting.

Tell the healthcare professional about all medicines, hormones, and supplements you use. Anticoagulants like warfarin or apixaban are particularly important because they can change the antithrombin level or interfere with the laboratory method.

Do not stop an anticoagulant or any other medicine on your own. Interrupting treatment can be dangerous. If testing is necessary during treatment, the laboratory may use a different method or interpret the result cautiously.

No special restriction on ordinary activity is usually needed. Follow any instructions given for other tests collected at the same appointment.

What happens during the test

A healthcare professional places a small needle into a vein, usually in your arm. Blood is collected into a tube containing an additive that prevents clotting before analysis.

The needle is removed and pressure is applied. The blood draw usually takes only a few minutes.

The laboratory processes the sample to obtain plasma, the liquid part of blood, and measures antithrombin activity, antigen, or both.

Understanding your results

Results are compared with the reference range on your laboratory report. Interpretation varies by laboratory, method, age, pregnancy status, medicines, and clinical context.

A low activity result means antithrombin did not work normally in the sample. It does not show by itself whether the cause is inherited or acquired.

If activity is low, an antigen test may show one of two broad patterns:

These patterns may suggest different inherited deficiencies, but repeat testing and clinical information are usually needed. Genetic testing is sometimes considered when it could clarify a suspected inherited condition or help assess relatives.

A high antithrombin result is generally less clinically significant and is not usually considered a cause of abnormal bleeding.

- Low activity and low antigen: less antithrombin protein is present
- Low activity with normal antigen: enough protein is present, but it may not work normally

What affects the results

An active or recent clot can consume antithrombin. Major surgery, severe infection, widespread clotting activation, and serious illness may also lower it temporarily.

Kidney conditions that cause protein loss in urine can reduce antithrombin. Liver disease can reduce its production. Pregnancy, particularly around delivery, may also affect the level. Babies

and young children need age-adjusted interpretation.

Medicines and treatments are important:

A clotted, underfilled, or poorly handled sample may be unsuitable. Ordinary meals, coffee, time of day, and routine exercise are not usually major influences.

- Heparin can lower antithrombin levels
- Some direct oral anticoagulants can produce falsely normal or high activity results
- Interference depends on the medicine and assay
- Estrogen-containing medicines may affect clinical interpretation
- Antithrombin concentrate or plasma transfusion can temporarily raise the level
- A recent transfusion may make inherited deficiency harder to assess

Accuracy and limitations

Activity testing finds many clinically important deficiencies but may miss some inherited variants. The result can be normal when a variant is not detected well by the particular assay.

False-low results can occur during acute thrombosis, serious illness, heparin treatment, liver disease, kidney protein loss, or pregnancy. These may resemble inherited deficiency even when the change is temporary or acquired.

False-normal results are also possible. Direct factor Xa inhibitors can mask low antithrombin in factor Xa-based tests. Dabigatran and other direct thrombin inhibitors can interfere with thrombin-based tests. Laboratories may use another assay, remove the medicine from the sample, or recommend testing later.

Test performance varies by assay, medicine exposure, timing, and the type of variant. Repeat activity and antigen testing when you are medically stable is often more informative than one result. Genetic testing may help when laboratory findings and family history strongly suggest inherited deficiency but remain unclear.

Risks and complications

The risks are those of an ordinary blood draw. You may have brief discomfort, a small bruise, or feel faint. Serious complications are uncommon.

What happens next

A result within the laboratory range may end the assessment. Further evaluation may still be needed if testing occurred during anticoagulant treatment or another interfering condition.

A low result is commonly repeated after temporary influences have resolved. Follow-up may include an antigen test, review of liver and kidney function, genetic testing, or assessment of relatives. Results are interpreted alongside your clotting and family history, medicines, pregnancy status, and reason for testing.

Follow-up is usually routine rather than urgent. However, symptoms of a possible new blood clot need prompt attention regardless of the result. Seek urgent medical care for new one-sided leg swelling or pain. Call emergency services for sudden shortness of breath, chest pain, coughing up blood, fainting, or severe breathing difficulty.

Common questions

Can I drink coffee before the test?

Yes. Coffee does not usually affect the test. Follow separate preparation instructions for any other blood tests.

Do I need to fast?

No fasting is normally required unless you have been given different instructions for another test.

Does the time of day matter?

The test does not usually need to be performed at a specific time. Your medicines and the timing of your most recent dose may matter more.

Can I exercise beforehand?

Routine exercise is unlikely to change the result meaningfully. The timing may need review if you are acutely unwell, recovering from surgery, or being assessed for a recent clot.

Can I have the test while taking a blood thinner?

Yes, but anticoagulants may alter or interfere with the result. Do not stop treatment yourself. The laboratory needs to know the exact medicine and when you last took it.

Will one low result confirm an inherited deficiency?

Usually not. Illness, an active clot, medicines, pregnancy, kidney disease, and liver disease can lower the result. Repeat activity testing, an antigen test, or genetic testing may be needed.

Sources

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