TEST

Partial thromboplastin time

A blood test that measures how long part of the clotting process takes

WHAT IT MEASURES
Seconds for blood plasma to form a clot

SAMPLE
Blood from a vein

FASTING NEEDED?
No

HOW LONG IT TAKES
About 5 to 10 minutes

RESULTS IN
Same day to 2 days, varying by laboratory

USED FOR
Investigating clotting problems and monitoring unfractionated heparin

MAIN LIMITATION
Collection problems and medicines can prolong results without a bleeding disorder

Overview

Partial thromboplastin time, or PTT, measures how many seconds it takes your blood plasma to form a clot under laboratory conditions. Plasma is the liquid part of blood.

Most laboratories perform an activated partial thromboplastin time , called aPTT. PTT and aPTT are often used to mean the same test.

The test looks at several clotting proteins, including factors VIII, IX, XI and XII. It also reflects proteins in the "common pathway," the final series of steps that forms a stable blood clot. It does not assess every part of clotting. For example, it does not directly measure how well your platelets work.

Why the test is ordered

A PTT may help investigate unexplained bleeding or bruising. It may also be used when a healthcare professional suspects that one or more clotting proteins are low or not working normally.

Other reasons include:

Despite its name, lupus anticoagulant is not necessarily linked to lupus. It is an antibody that can prolong the PTT in the laboratory but is more often associated with clotting than bleeding.

PTT is not a complete screening test for all bleeding or clotting conditions. Routine testing before every operation is not always useful, especially when there is no personal or family history of unusual bleeding.

- Monitoring treatment with intravenous unfractionated heparin
- Investigating an unexpected result from another clotting test
- Assessing possible clotting inhibitors, such as lupus anticoagulant like warfarin or apixaban
- Helping evaluate serious liver illness or widespread abnormal clotting
- Checking clotting before some procedures when your history suggests a risk

Who should have the test

You may be offered a PTT if you have bleeding that is difficult to explain, frequent large bruises, unusually heavy menstrual bleeding or excessive bleeding after surgery, dental work or childbirth.

It may also be ordered after an unexplained blood clot, particularly as part of testing for certain antibodies. However, PTT alone cannot identify why a clot occurred.

If you receive unfractionated heparin, repeated tests may be used to adjust treatment. Some hospitals use an anti-Xa test instead because PTT can be affected by factors unrelated to heparin.

Whether testing is appropriate depends on your symptoms, medical history, medicines and other laboratory results.

How to prepare

You usually do not need to fast. You can normally eat, drink water and have coffee unless you are also having another test that requires fasting.

Tell the person arranging the test about prescription medicines, over-the-counter products and supplements. This is especially important for heparin, warfarin, direct oral anticoagulants and other medicines that affect clotting.

Do not stop an anticoagulant, sometimes called a blood thinner, unless the clinician responsible for it tells you to do so. Stopping it without a plan may increase your risk of a blood clot.

If possible, mention any recent blood transfusion or problems with previous blood draws.

What happens during the test

A healthcare worker places a small needle into a vein, usually in your arm. Blood is collected into a tube containing citrate, which prevents clotting before the sample reaches the laboratory.

The tube must be filled to the correct level. The laboratory then separates the plasma and adds substances that start a controlled clotting reaction. A machine records the time until a clot forms.

The blood draw usually takes a few minutes. If you have an intravenous line, the sample may be taken from a different vein to reduce the chance of contamination by heparin or other fluids.

Understanding your results

Your result is usually reported in seconds. Always use the reference range printed on your own report. Ranges and interpretation vary by laboratory, testing method, age, sex, pregnancy status, medicines and clinical context.

A prolonged PTT means clotting took longer than expected in that laboratory. Possible explanations include an anticoagulant medicine, a low clotting factor, an antibody that interferes with the test, significant liver dysfunction or abnormal clotting during severe illness. A collection problem can produce the same result.

A prolonged result does not automatically mean that you are likely to bleed. Lupus anticoagulant, for example, may prolong the test without causing a bleeding tendency.

A short PTT means the sample clotted faster than the laboratory range. This can occur when factor VIII is raised during inflammation, stress or pregnancy. Collection or processing conditions can also contribute. A short result is usually interpreted alongside your history rather than on its own.

A normal PTT does not exclude every bleeding disorder. Platelet problems, factor XIII deficiency, many cases of von Willebrand disease and mild deficiencies of other clotting factors can be present with a normal result.

What affects the results

A PTT is especially sensitive to how the blood is collected and processed. An unexpected result may be real even when the laboratory has made no technical error.

Important influences include:

Direct oral anticoagulants affect PTT unpredictably. A normal PTT cannot reliably prove that these medicines are absent or no longer active.

Ordinary daily activity usually has little effect. Very intense exercise may temporarily alter clotting proteins, but this is rarely the main explanation for an abnormal result.

- An underfilled tube: Too much citrate compared with blood can falsely prolong the result
- Heparin contamination: Blood taken through a heparin-treated line may appear to clot slowly
- A clot in the sample: This can use up clotting proteins and make the result unreliable
- Delayed processing: Clotting factors can change while the sample waits
- A very high red blood cell level: Extra citrate may require a laboratory adjustment
- Medicines: Heparin, warfarin, dabigatran, argatroban and some other anticoagulants can prolong PTT
- Kidney function: Reduced clearance can increase the effect of some anticoagulants, especially dabigatran
- Pregnancy or acute illness: Higher clotting factor levels may shorten PTT or hide another effect
- Age: Newborns and young children can have different clotting factor levels from adults
- Recent transfusion: Donated plasma or blood products can temporarily change clotting results

Accuracy and limitations

PTT is good at detecting some major clotting factor deficiencies and the effect of unfractionated heparin. However, different PTT reagents do not respond equally to every factor deficiency, inhibitor or medicine.

The test can miss mild deficiencies. It can also be normal in conditions that affect platelets or parts of clotting not measured by PTT. In other words, a normal result can occur even when another type of clotting problem is present.

A prolonged result can suggest a problem when there is no bleeding disorder. Common reasons include lupus anticoagulant, heparin contamination and an incorrectly filled collection tube.

Different tests may answer more specific questions. PT/INR assesses another part of clotting and is generally used to monitor warfarin. An anti-Xa test may be better for measuring heparin in some situations. Factor assays measure individual clotting proteins, while specialised antibody tests investigate lupus anticoagulant. No single test replaces clinical history.

Risks and complications

The main risks are brief discomfort, a small bruise or feeling faint during the blood draw. Applying pressure afterward usually limits bruising.

What happens next

An unexpected abnormal result is often repeated, especially when a collection problem is possible. Your healthcare professional will compare it with your symptoms, medicines, previous results and tests such as PT/INR, platelet count, fibrinogen or thrombin time.

A mixing study may be performed. Your plasma is mixed with normal plasma and retested. Correction toward normal suggests that a clotting factor may be low; failure to correct suggests a medicine or inhibitor may be interfering. Further testing is still needed to confirm the cause.

An abnormal PTT without active bleeding is generally addressed through routine follow-up. Seek urgent medical care for bleeding that will not stop, vomiting blood, black or bloody stools, or unusually heavy bleeding with weakness or faintness. Call emergency services for sudden severe headache with confusion, weakness or difficulty speaking, particularly if you take an anticoagulant.

Common questions

Can I drink coffee before a PTT test?

Usually, yes. PTT does not require fasting, so plain coffee does not normally affect it. Follow separate instructions if other blood tests are being collected at the same time.

Does the time of day matter?

Usually not. Timing may matter when the result is being used to monitor an anticoagulant infusion or when it must be compared with a medicine dose. Follow the timing given by your care team.

Can I exercise beforehand?

Normal activity is unlikely to matter. Very intense exercise can temporarily affect clotting proteins, so mention recent strenuous exercise if your result is unexpected.

Should I take my blood thinner before the test?

Take it exactly as prescribed unless the clinician managing it gives different instructions. The reason for testing determines whether the sample should be collected before or after a dose.

Why is my PTT high if I do not bleed easily?

Some antibodies and medicines prolong clotting in the test tube without causing a bleeding tendency. Sample collection problems can do this as well. The result needs to be interpreted with your history and other tests.

How quickly will I get the result?

Hospitals may report urgent results within hours. Routine outpatient results are often available the same day or within two days, but turnaround varies by laboratory.

Sources

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