TEST

Prothrombin time (PT)

A prothrombin time test measures how long your blood takes to clot.

WHAT IT MEASURES
Seconds needed for blood plasma to form a clot

SAMPLE
Blood from a vein

FASTING NEEDED?
No

HOW LONG IT TAKES
Usually less than five minutes

RESULTS IN
Usually same day; timing differs by laboratory

USED FOR
Monitoring warfarin and investigating abnormal bleeding or clotting

MAIN LIMITATION
Results change with reagents, medicines, illness, and sample quality

Overview

A prothrombin time, or PT, measures how many seconds it takes a blood sample to form a clot. The laboratory starts clotting by adding substances to the liquid part of your blood, called plasma.

PT mainly assesses the "extrinsic" and "common" clotting pathways. These are linked steps involving proteins called clotting factors. Your body uses these factors to control bleeding after an injury.

Results may be reported as PT in seconds, an international normalized ratio (INR), or both. The INR adjusts for differences between laboratory testing materials. It is mainly used to monitor warfarin, an anticoagulant medicine that reduces blood clotting.

PT does not show where bleeding is coming from, and it cannot assess every part of the clotting process. It is often interpreted with your symptoms, medicines, medical history, platelet count, and activated partial thromboplastin time (aPTT).

Why the test is ordered

PT is commonly ordered to monitor warfarin treatment. Regular INR testing helps check whether warfarin is having the intended effect without reducing clotting too much.

A healthcare professional may also order PT to investigate:

The liver makes many clotting factors. Liver disease can therefore lengthen the PT. Vitamin K is also needed to produce several of these factors.

PT may be requested before some procedures, particularly if you have a history of abnormal bleeding, take anticoagulants like warfarin or apixaban , or are having an operation with a meaningful risk of bleeding. It is not a complete check of whether surgery is safe, and a normal result does not rule out every bleeding condition.

- Unexplained or unusually heavy bleeding
- Frequent or large bruises
- An abnormal result from another clotting test
- Possible liver problems
- Possible vitamin K deficiency
- A suspected deficiency of certain clotting factors

Who should have the test

You may need PT or INR testing if you take warfarin. How often you are tested is based on your treatment plan, recent results, medicine changes, illness, and how stable your INR has been.

You may also be tested if you have symptoms or a medical history suggesting abnormal bleeding, liver disease, vitamin K deficiency, or a clotting-factor problem.

PT is not usually a general screening test for people without relevant symptoms, medicines, or medical history. Whether it is useful before a procedure depends on your individual circumstances and the type of procedure.

How to prepare

Fasting is not normally required. You can usually eat, drink water, and have coffee before the test unless you are also having another test that requires fasting.

Tell the person arranging the test about all prescription medicines, over-the-counter products,

vitamins, and herbal supplements you use. Important examples include warfarin, heparin, direct oral anticoagulants, antibiotics like amoxicillin or doxycycline , and products containing vitamin K.

If you take warfarin, follow the instructions you have been given about when to take it in relation to the blood test. Do not skip, double, or stop a dose unless your prescribing team tells you to.

You do not usually need to avoid foods containing vitamin K. If you take warfarin, large changes in your intake of foods such as leafy green vegetables can change your INR. A reasonably consistent eating pattern is generally more useful than suddenly avoiding these foods.

Routine activity does not usually affect PT enough to require rest beforehand. Tell the laboratory if you are acutely unwell or have recently had a blood transfusion.

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 citrate, which temporarily prevents clotting.

The tube must contain the correct ratio of blood to citrate. The laboratory then separates the plasma and measures how long it takes to clot after specific chemicals are added.

The blood draw usually takes less than five minutes. If you are having a finger-prick INR test, a small drop of blood is placed into a portable testing device instead.

Understanding your results

PT is usually reported in seconds. INR is a calculated value designed to make warfarin results more comparable between laboratories.

There is no single PT range that is appropriate for every laboratory or situation. Results and their interpretation vary with the laboratory method, age, sex, pregnancy status, medicines, and clinical context.

If you take warfarin, your target INR is set for the condition being treated and your individual circumstances. A result below your target can mean the blood is clotting faster than intended. A result above your target can mean it is clotting more slowly than intended. One result does not automatically mean your dose should change.

A prolonged PT can occur with warfarin use, liver disease, vitamin K deficiency, a deficiency of certain clotting factors, severe illness, or interference from another anticoagulant. Sample

collection problems can also cause an unexpectedly long result.

A shorter-than-expected PT is usually less helpful diagnostically. It may reflect normal variation, pregnancy-related clotting changes, inflammation, or a sample issue. It does not by itself prove that you have an increased risk of a blood clot.

What affects the results

Several factors can change PT without indicating a new clotting disorder.

Warfarin is intended to lengthen PT and INR. Other anticoagulants, including heparin and direct oral anticoagulants, may also affect the result, although the effect is inconsistent and depends on the medicine, dose timing, and laboratory reagent.

Antibiotics, changes in diet, vomiting, diarrhoea, poor food intake, and some supplements can alter vitamin K availability and change INR in someone taking warfarin. Alcohol use and acute illness may also affect warfarin control.

Liver function matters because the liver produces clotting factors. Kidney disease does not directly determine PT, but it can change the handling of some anticoagulants and may occur alongside illnesses that affect clotting.

Pregnancy changes the clotting system and may alter results. Newborn babies and young infants also require age-appropriate interpretation.

A recent plasma transfusion, blood transfusion, vitamin K treatment, or clotting-factor replacement can temporarily change PT. The timing of these treatments must be considered.

Sample problems are especially important. An underfilled citrate tube, a clot in the tube, delayed testing, a very high red blood cell concentration, or contamination with heparin from an intravenous line can produce a misleading result. If a result does not fit the clinical situation, repeating a properly collected sample may be appropriate.

Accuracy and limitations

PT is reliable for monitoring warfarin when the sample is collected correctly and the INR is calculated using an appropriate laboratory method. Point-of-care devices can also be useful, but unexpected results may need confirmation with a laboratory blood sample.

There is no single percentage describing how often PT misses a problem or incorrectly suggests one. Performance depends on the condition being investigated, the clotting factor involved, the testing reagent, and the degree of abnormality.

A normal PT can miss mild clotting-factor deficiencies. It can also be normal in platelet disorders, von Willebrand disease, and some conditions affecting parts of the clotting system measured better by aPTT or specialist tests.

An abnormal PT does not necessarily mean you have a bleeding disorder. Medicines, liver disease, vitamin K changes, severe illness, or sample collection errors can produce the same finding.

PT or INR should not be used to measure the anticoagulant effect of most direct oral anticoagulants. Drug-specific testing may be more appropriate when an accurate measurement is needed. Mixing studies, clotting-factor tests, liver tests, fibrinogen, platelet tests, or aPTT may be used to investigate an unexplained result.

Risks and complications

A blood draw may cause brief discomfort, a small bruise, or light-headedness. Serious complications from routine blood collection are uncommon.

What happens next

If your result is within the range expected for your situation, you may continue your current plan. People taking warfarin are usually given a date for routine repeat INR testing.

An unexpected result may be repeated, especially if there may have been a collection problem. Your healthcare professional may review your medicines, recent doses, diet, alcohol intake, illness, and any signs of bleeding or clotting. Other blood tests may be arranged if the cause remains unclear.

Contact your anticoagulation or prescribing team promptly if your INR is outside the target they gave you, even if you feel well. Do not adjust warfarin yourself unless you have a specific self-management plan.

Seek urgent medical help for bleeding that will not stop, blood in vomit, coughing up blood, black or heavily bloody stools, severe or worsening headache, sudden weakness, fainting, or a significant head injury while taking an anticoagulant. These symptoms require assessment rather than waiting for routine follow-up.

Common questions

Can I drink coffee before a PT test?

Usually, yes. PT does not require fasting, so plain or milky coffee is generally acceptable unless another test scheduled at the same time has different instructions.

Does the time of day matter?

The PT itself does not normally require a particular time. If you take warfarin or another anticoagulant, consistent timing can help your team interpret the result alongside your most recent dose.

Can I exercise beforehand?

Normal activity is unlikely to cause an important change. You generally do not need to avoid exercise, although it is sensible to mention severe exertion, dehydration, or acute illness if a result is unexpected.

Should I take warfarin before the test?

Take it according to your existing instructions. Do not delay or skip a dose just because you are having an INR test unless your anticoagulation team specifically told you to.

Can I test my INR at home?

Some people use an approved finger-prick device after receiving training and a follow-up plan. Home testing is not suitable for everyone, and unexpected readings may need confirmation with a venous laboratory sample.

Why was my PT repeated?

A repeat may check an unexpected result or rule out a collection problem, such as an underfilled tube or contamination from an intravenous line. Repeating the test does not by itself mean a serious condition is suspected.

Sources

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