

PROTHROMBIN TIME

Interpretation of PT and PTT in Patients with a Bleeding or Clotting Syndrome

| PT RESULT | PTT RESULT | EXAMPLES OF CONDITIONS THAT MAY BE PRESENT |
|-----------|------------------------------|---|
| Prolonged | Normal | Liver disease, decreased vitamin K, decreased or defective factor VII, chronic low-grade disseminated intravascular coagulation (DIC) , anticoagulation drug (warfarin) therapy |
| Normal | Prolonged | Decreased or defective factor VIII, IX, or XI, von Willebrand disease (severe type), presence of lupus anticoagulant |
| Prolonged | Prolonged | Decreased or defective factor I, II, V or X, severe liver disease, acute DIC |
| Normal | Normal or slightly prolonged | May indicate normal hemostasis ; however, PT and PTT can be normal in conditions such as mild deficiencies in other factors and mild form of von Willebrand disease. Further testing may be required to diagnose these conditions. |

Patient: What is it for?

Doctor: The prothrombin time (PT) test measures how long it takes for a clot to form in a sample of blood. In the body, the clotting process involves a series of sequential chemical reactions called the coagulation cascade, in which coagulation or "clotting" factors are activated one after another and result in the formation of a clot. There must be a sufficient quantity of each coagulation factor, and each must function properly, in order for normal clotting to occur. Too little can lead to excessive bleeding; too much may lead to excessive clotting.

Patient: How is it used?

Doctor: The prothrombin time (PT) test is ordered to help diagnose unexplained bleeding, often along with a partial thromboplastin time (PTT) test. Occasionally, the tests may be used to screen people for any previously undetected bleeding problems prior to surgical procedures.

The PT and INR (International normalized ratio) are used to monitor the effectiveness of the anticoagulant warfarin (COUMADIN®). This drug affects the function of the coagulation cascade and helps inhibit the formation of blood clots. It is prescribed on a long-term basis to people who have experienced recurrent inappropriate blood clotting. Common clinical indications for warfarin use are atrial fibrillation, the presence of artificial heart valves, deep venous thrombosis, and pulmonary embolism. Warfarin is also used in antiphospholipid syndrome, and occasionally in heart attacks. The goal with warfarin therapy is to maintain a balance between preventing clots and causing excessive bleeding.

Patient: When is it ordered?

Doctor: When a person is taking the anticoagulant drug warfarin, the doctor will order periodic PT/INR tests to ensure that the prescription is working properly and that the PT/INR is appropriately prolonged. A doctor will order them often enough to make sure that the drug is producing the desired effect - that it is increasing the person's clotting time to a therapeutic level without causing excessive bleeding or bruising.

The PT may be ordered when a person who is not taking anticoagulant drugs has signs or symptoms of a bleeding disorder, which can range from nosebleeds, bleeding gums, bruising, heavy menstrual periods, blood in the stool and/or urine to arthritic-type symptoms (damage from bleeding into joints), loss of vision, and chronic anemia.

PT, along with PTT, is routinely ordered when a person is to undergo an invasive medical procedure, such as surgery, to ensure normal clotting ability.

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Patient: How is the sample collected for testing?

Doctor: A blood sample is obtained by inserting a needle into a vein in the arm or, sometimes, from a finger stick.

Patient: What are some things that could affect the result?

Doctor: Some consumed substances, such as alcohol, can affect the PT/INR test. Some antibiotics can increase the PT/INR. Barbiturates, oral contraceptives and hormone-replacement therapy (HRT), and vitamin K (either in a multivitamin or liquid nutrition supplement) can decrease PT. Certain foods, such as beef and pork liver, green tea, broccoli, chickpeas, kale, turnip greens, and soybean products, contain large amounts of vitamin K and can alter PT results. It is important that a doctor knows about all of the drugs, supplements, and foods that a person has ingested recently so that the PT/INR results are interpreted and used correctly.

QUESTIONS:

1. **What are some common indications for warfarin use?**
2. **What is the use of this procedure?**
3. **Who are those people who need to undergo this test?**