Prothrombin time (PT)

Clotting-Guide
vom Labor zur Diagnose

Synonyms:
Quick-Test, Normotest, thromboplastin time, INR (international normalized ratio).

Description, significance:
The PT is a global test of the hemostasis system that covers the extrinsic pathway (tissue-factor pathway). This includes factors VII, X, II; some test systems are also sensitive to factor V and fibrinogen. Due to the short half-life of factor VII, it has the greatest influence on the PT.
The PT is used to monitor anticoagulant therapy with vitamin K antagonists (as INR), to assess liver function and as a global test for the general assessment of hemostasis.

The INR is derived from a conversion factor (ISI) specified by the manufacturer of the thromboplastin reagent according to the formula: INR = (patient PT in seconds / normal plasma PT in seconds)^ISI calculated. The INR thus enables the reagents for oral anticoagulant therapy to be compared with vitamin K antagonists and is recommended by all national and international specialist societies as a parameter for controlling oral anticoagulation. Calculating the INR only makes sense for PT values below 40%.

Reference range:
The PT is standardized and is given as a percentage of a normal collective. The normal range for adults is 75-120%.
The INR is used exclusively to monitor therapy with vitamin K antagonists; depending on the indication, the therapeutic range is between 1.5 and 3.5.

Increased values:
Elevated PT values have no clinical relevance.

Decreased values:
Decreased PT levels occur in vitamin K deficiency, liver dysfunction, or congenital or acquired deficiency of factors II, V, VII, or X. Direct oral anticoagulants can affect the PT in unpredictable ways.

Preanalytics:
The PT is determined automatically from citrate plasma. Care must be taken to collect blood accurately, avoid contamination, fill the blood tube correctly and mix well with the citrate. The blood sample must be sent to the laboratory as quickly as possible.

Influencing/disturbing factors:
Anticoagulants, contamination, large hematocrit abnormalities, paraproteins and immune phenomena can influence PT.

References:
Thomas L, Laboratory and Diagnosis, 2023, Release 5: https://www.labor-und-diagnose.de/index.html
Parameter catalog of the Clinical Institute for Laboratory Medicine, Med.Univ.Wien and AKH Vienna: https://www.akhwien.at/default.aspx?pid=3982
List of services for clinical chemistry, Univ.Klinikum Ulm: https://www.uniklinik-ulm.de/zentrale-einrichtung-klinische-chemie/leistungskatalog.html