COAGULATION PROFILE

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- BT(bleeding time)
- CT (Clotting time)
- Pt(prothrombin time)
- PTT(Partial thromboplastin time)

Bleeding time (BT)

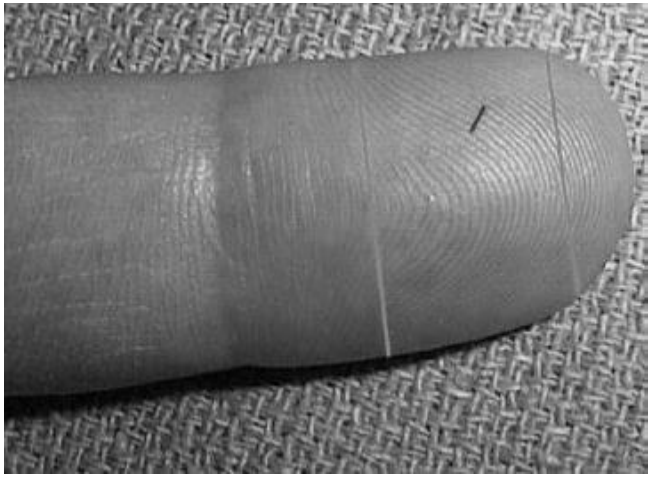
- **Bleeding time is a screening test performed by measuring how long it taken for bleeding to stop from a fresh cut of determined size.**
- **This test is useful for**
- **detecting bleeding disorders.**

the patients may present with unexplained nosebleeds , excessive or prolonged menstrual blood flow (menorrhagia), or prolonged bleeding after minor cuts, tooth brushing or trauma. Other patients may have unexplained skin lesions, including petechiae (hemorrhages**).**

- **Before surgery**

Bleeding time (BT)

- The test is done by making Finger stick or Finger prick
- The normal time is about 2-5 minutes.



Causes of prolonged bleeding

- Decreased number of thrombocytes (thrombocytopenia)
- Von Willebrand disease
- haemophilia
- Cyclooxygenase inhibitors as Aspirin can prolong bleeding time significantly.

Disadvantages

- There is a poor correlation between the degree of prolongation of the bleeding time and the degree of clinical bleeding.
- Bleeding time is insensitive to platelet dysfunction as many patients with congenital and acquired platelets dysfunction will have normal bleeding time

Clotting time (CT)

- It is the whole blood clotting time which investigate the efficiency of blood coagulation.
- This test is done in cases of
- Liver disease that can affect clotting factors.
- Before surgery .

Clotting time (CT)

- Procedure:
  - Blood sample is collected from the vein (about 0.5 ml)
  - The blood is placed into a glass tube
  - The tube is warmed to 37 degree
  - Tilt the tube every 30 seconds interval until blood clots.

Clotting time (CT)

- Disadvantages
- Low blood volume will give short time
- Low incubation temperature will shorten clotting time Unnecessary agitation of blood sample shorten clotting time

Clotting time (CT)

- Normal :5-10 min

Types of Coagulation Tests

Prothrombin Time (PT)
Evaulates ability to clot

International Normalized Ratio (INR)
Ensures that results from a PT test are the same from one lab to another

Partial Thromboplastin Time (PTT)
Determines if blood-thinning therapy is effective

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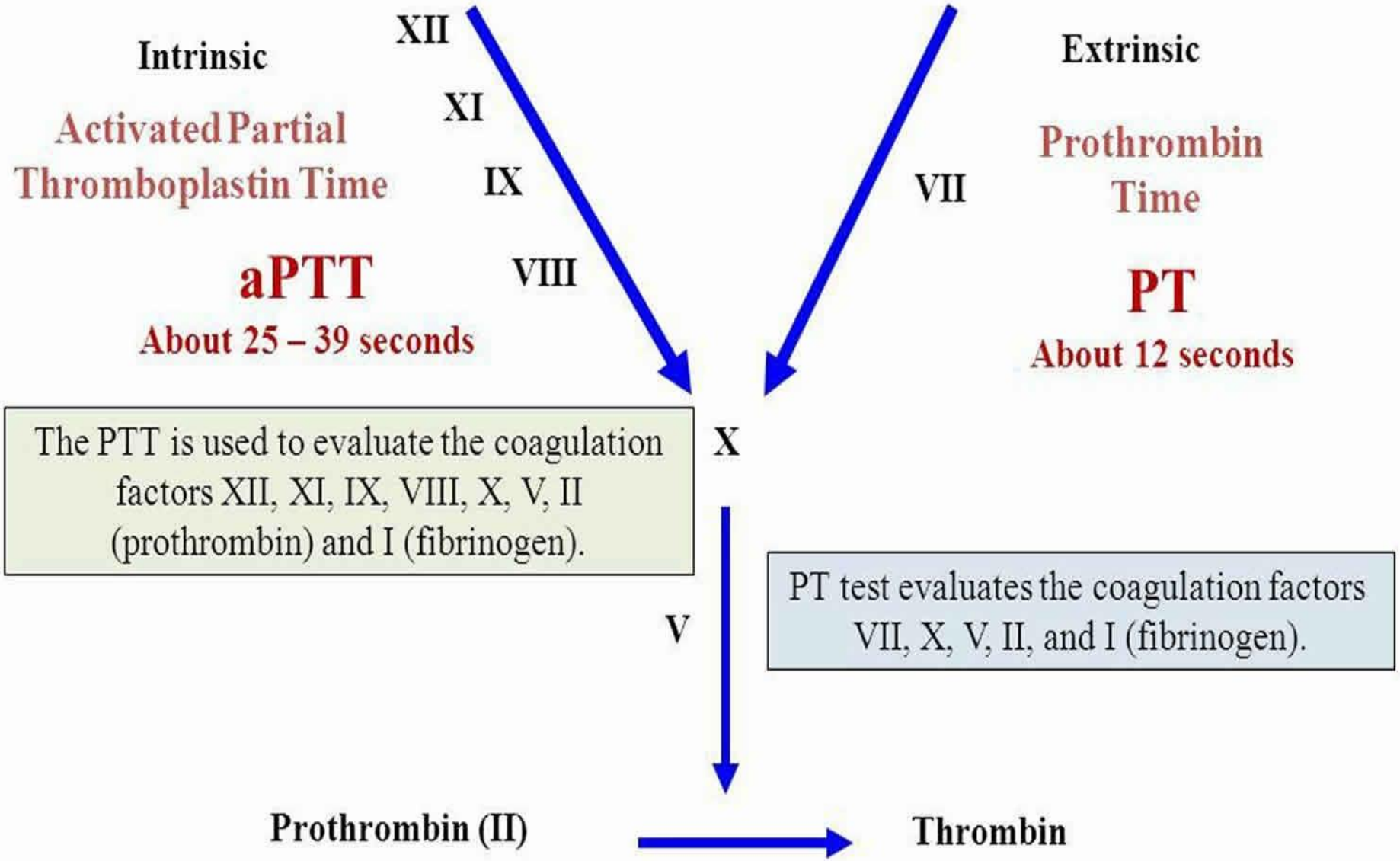
Tests of Clotting Pathway



Prothrombin time (PT)

- The prothrombin time (PT) and its derived measures of international normalized ratio (INR) are measures of the extrinsic pathway of coagulation. They are used to determine the clotting tendency of blood, in the measure of anticoagulant dosage, liver damage, and vitamin K status.

Prothrombin time (PT)

Principle

- An excess of calcium is added (thereby reversing the effects of citrate), which enables the blood to clot again. Tissue factor (also known as factor III) is added, and the time the sample takes to clot is measured .

Manual test:

- Incubate 200 µl reagent at 37 degree for 15 min.
- Incubate 100 µl plasma at 37 degree for 15 min.
- Add the plasma to the reagent and start the stop watch simultaneously and note the clotting time.

Prothrombin time (PT)

- **Automated coagulation machines:**

- The progress of clotting may be monitored by two methods

I. Mechanical monitoring
II. Optical monitoring

Mechanical Monitoring

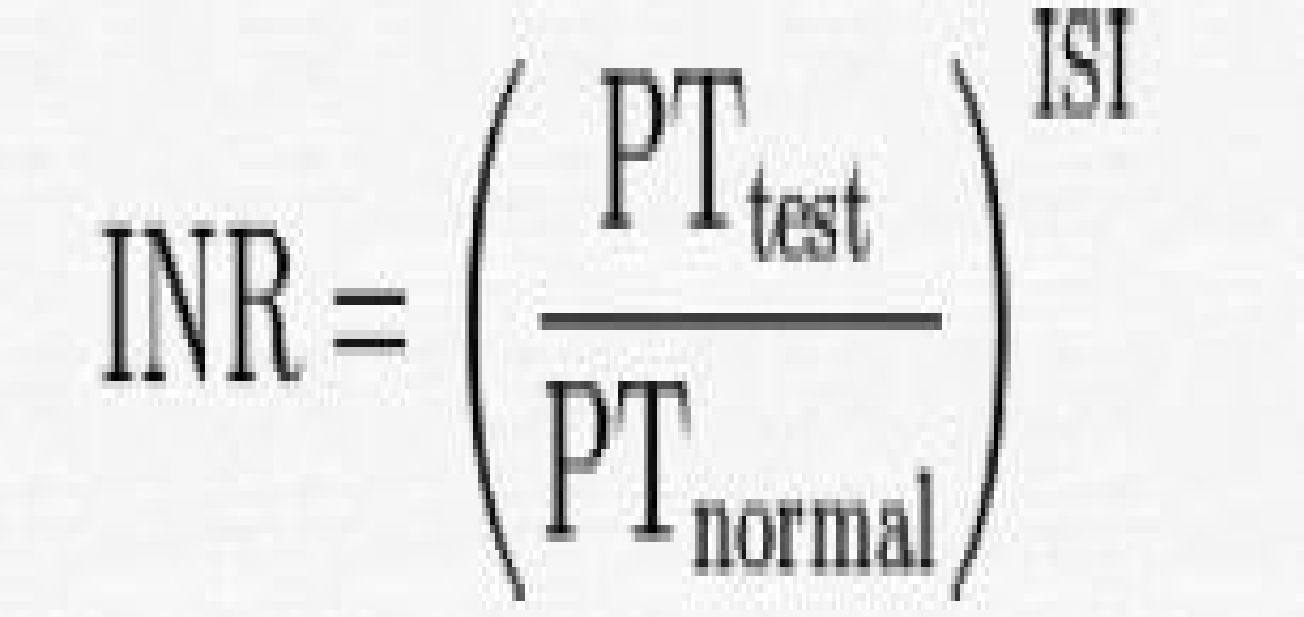
- This method use a vibrating probe which is suspended in a reaction cup.
- The movement of the probe is continuously measured through amagnetic system.
- As the fibrin monomer polymerization proceeds and viscosity increase ,
- there is increased resistance to the movement of the probe until it stop. This impedance to the movement of the probe is recorded .

Optical monitoring

- The characteristic of fibrin monomer polymerization can be determined by measuring the changing turbidity of the plasma due to the formation of fibrin polymer
- The growing polymer will take a light scattering characteristics and this scattered light as well as transmitted light can be recorded at 650 nm by photo detectors.

International normalised ratio (INR)

- The reference range for prothrombin time is usually around 11–16 seconds (70% - 100%) The normal range for the INR is 0.8–1.2



Causes of prolonged Pt

- anti-coagulant therapy
- as a result of deficiencies in vitamin K, which can be caused by malabsorption, or lack of intestinal colonization by bacteria (such as in newborns)
- poor factor VII synthesis (due to liver disease as hepatitis and cirrhosis)
- increased factor VII consumption (in disseminated intravascular coagulation)
- Deficiency of factors X , II , V , I

Partial Thromboplastin time (PTT)

- The partial thromboplastin time (PTT) or activated partial thromboplastin time (aPTT or APTT) is a performance indicator measuring the efficacy of both the "intrinsic" (now referred to as the contact activation pathway) and the common coagulation pathways.
- **This test is done in some cases :**
  - **Injection Heparin therapy**
  - **Pre surgical screening**

PTT

- Procedure
  - In order to activate the intrinsic pathway, phospholipid, an activator (such as silica) which activate the contact depending factor XII, and calcium are mixed into the plasma sample . The time is measured until a thrombus (clot) forms. This testing is performed by a medical technologist.
  - **Normal pTT :30-45**

Prolonged PTT

- Indicate :
  - Using Heparin as anti coagulant
  - DIC
  - Deficiencies of clotting factors VIII, IX, XI and XII
  - Haemophilia and rarely von Willebrand factor.
  - In cases of antiphospholipid antibody syndrome and lupus anticoagulant.

Visit Number	Age	Gender	Referred By	Client ID
28720510409	32 Year	Male	Prof :-	539

Test Name	Result	Unit	Reference Range	Previous Result
Prothrombin Time (PT)				
Patient Prothrombin Time	13			
Control Prothrombin Time	13			
Prothrombin Concentration	100.0		70 - 120	
INR	1.00		0.9 - 1.27	
APTT (Citrated Plasma)	28.0		23 - 40	
Erythrocyte Sedimentation Rate (ESR) (Edta Blood)				
First Hour:	24		Up to 10	
Second Hour:	49			