

A graphic of a spiral-bound notebook with a brown cover and a cream-colored page. The spiral binding is on the left side. A horizontal line is drawn across the page, and the text is centered below it.

BLOOD PRACTICAL 3

Dr Thouraya



 **BLOOD GROUPS**

 **COAGULATION TIME**

 **BLEEDING TIME**

Antigens and antibodies

Group	Antigen on cells	Antibody in plasma
A	A	anti-B
B	B	anti-A
AB	A and B	neither
O	neither	anti-A and anti-B

Determination of blood groups

✚ *Major O-A-B blood groups*

Genotypes	Blood Types	Agglutinogens	Aglutinins
OO	O 49%	————	Anti-A & Anti- B
OA or AA	A 27%	A	Anti- B
OB or BB	B 20%	B	Anti -A
AB	AB 4%	A and B	————



 *Rhesus Blood Types*

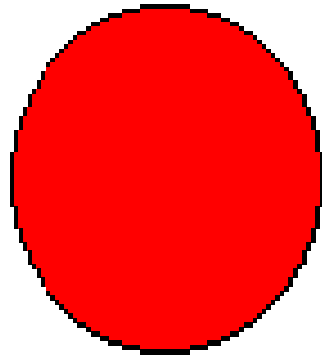
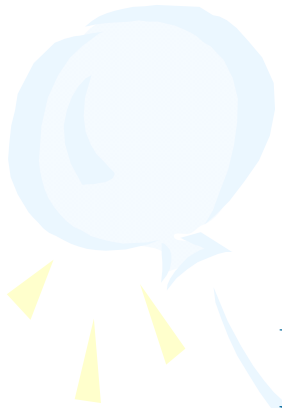
85% Rh+

15% Rh-

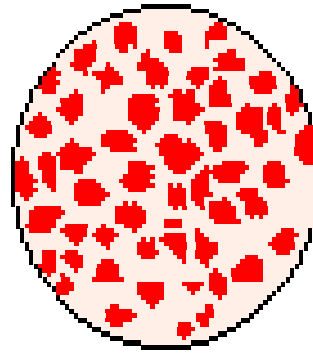
Blood typing is performed by mixing an individual's RBCs with anti sera containing the various agglutinins on a slide and seeing whether **agglutination occurs.**

Procedure:

- **From a finger stick, place a drop of blood at each end of a glass slide.**
- **Add one drop of anti A serum to the A side.**
- **Add one drop of anti B serum to the B side.**
- **Gently mix the samples.**
- **Examine for agglutination.**
- **When the RBCs clump together they have a speckled or peppered appearance.**

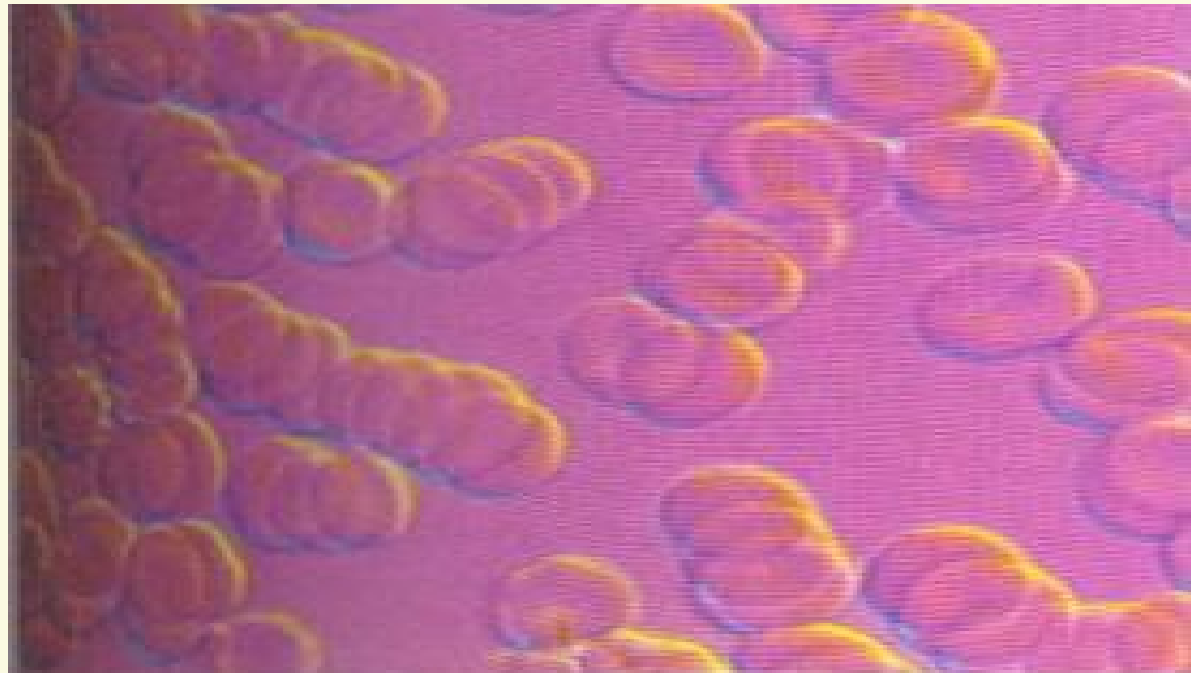


1 cm.



**Unagglutinated
blood smear**

Agglutinated blood



The red cells are being clumped ($\times 1400$)

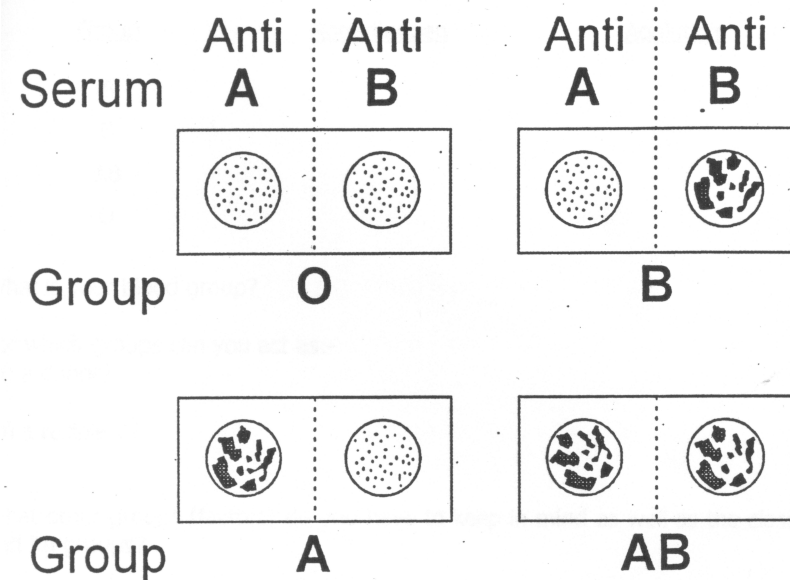
Type A blood has A agglutinogens and therefore, agglutinates with anti A agglutinins.

Type B blood has B agglutinogens and therefore, agglutinates with anti B serum.

Type AB blood has both A and B agglutinogens and agglutinates with both types of serum.

Type O RBCs have no agglutinogens and do not react with either the anti A or the anti B serum.

Interpretation



Slides showing the agglutination of blood with anti-A and anti-B sera

CLINICAL IMPORTANCE

+ Blood Transfusion

+ Medicolegal Importance

+ Rh-Fetal Maternal Compatibility

Blood transfusion

Group	Can donate blood to	Can receive blood from
A	A and AB	A and O
B	B and AB	B and O
AB	AB	all groups
O	all groups	O

📄 Rh- ve can't take from Rh+ve


📄 Rh+ve can take from Rh-ve


📄 Ex:

📄 A+ can receive from: A+ A- O+ O-

📄 A- can receive from A- O-

Minors blood group systems

 *Beside antigens of the ABO system, there are other erythrocyte Ags (and plasma ATBs against them): **Kell**, **Duffy**, **MN**, **Kidd**, **Lewis**.*

 *Transfusion reactions caused by the minor blood groups are relatively rare unless repeated transfusions are given.*

Determination of the bleeding time


Definition:

It is the time taken from the start of the bleeding to the stopping of the bleeding.

Procedure

- *Clean the lobe of the ear. Dry, make a skin puncture (3mm deep) and start the stopwatch.*
- *Collect the first drop of blood on the corner of a blotting paper and every 30 seconds thereafter.*





● *The blotting paper must not touch the puncture point at any time*

● *Keep each subsequent drop a little further along the side of the filter paper. The drops become progressively smaller.*

● *When no more blood appears, stop the stopwatch and note the time.*

 ***Normal range :2-5 minutes.***

 ***It is prolonged in:***

 ***Impaired capillary contractility***

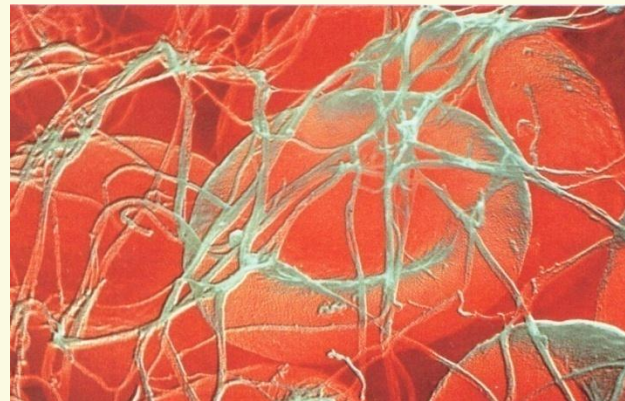
 ***Thrombocytopenia.***

 ***Or in platelet factor defects.***

Determination of the coagulation time

☞ **Clot or thrombus** consists of a meshwork of fibrin fibers, running in all directions and entrapping blood cells and platelets.

☞ The essential change in the coagulation of blood is the conversion of the soluble plasma fibrinogen into **insoluble fibrin**.

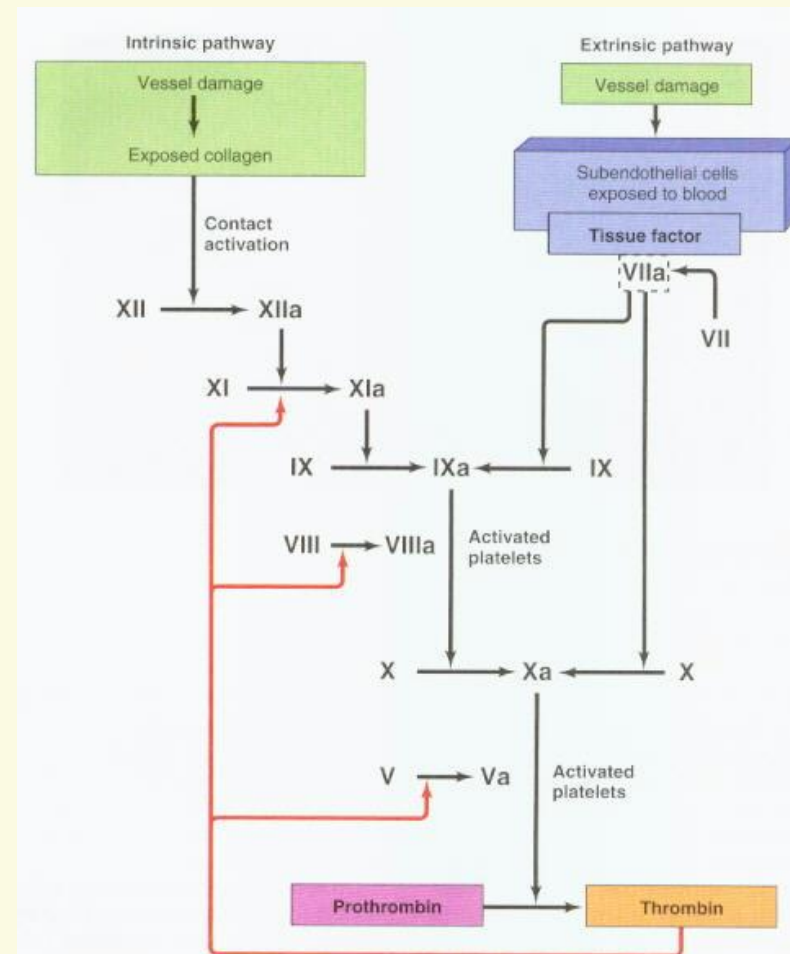


Initiation of clotting

In VIVO



The first plasma protein in the intrinsic pathway is **factor XII**: when it is disturbed such as by coming into contact with collagen (or with a wettable surface such as glass) it converts into **XIIa**.



In VITRO






- **The glass surface acts like collagen and induces the same activation of factor XII and aggregation of platelets as a damaged vessel surface.**

CLOTTING TIME

Definition:

It is the time taken from the start of bleeding to clot (fibrin) formation.

PROCEDURE

-  Prick a finger and start stop watch
-  Fill a capillary tube
-  2 minutes later break it and separate the two halves slowly.
-  Repeat the procedure at 30 second interval.
-  Stop the stop watch when fine strands of fibrin are seen between the broken ends.

Normal Range : 3 ó 6 mn

It is prolonged in:

- + Deficiency of any of the factors in the **intrinsic pathway**.**
- + **Hemophilia** (factor VIII deficiency) (85%) and Vonvillbrand disease (factor IX deficiency) (15%).**
- + Presence of a circulatory anticoagulant like heparin.**

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Thank You...