

## Blood Groups Clotting Time and Bleeding Time

### ADVICE: Get active

Getting – and staying – active can reduce your risk of developing heart disease. It can also be a great mood booster and stress buster.

# Objectives

At the end of this lab you should be able to:

1. Understand and practice the method used in determining blood groups (**ABO** and **Rhesus(Rh)** systems).
2. Determine your own **Bleeding** and **clotting** time.
3. Recognize the importance of bleeding time and clotting time in haemostasis.



ملاحظه: سألنا الدكتورة وقالت ما راح يطلبون منكم بالاختبار تسوون شي كل شي بيحي

جاهز قدامكم

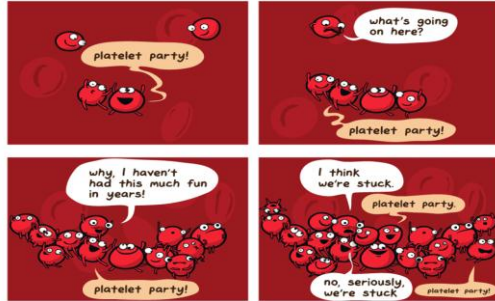
# Aims of the Practical

To determine:

1. Blood groups.



2. Clotting time.



3. Bleeding time.



# Blood groups

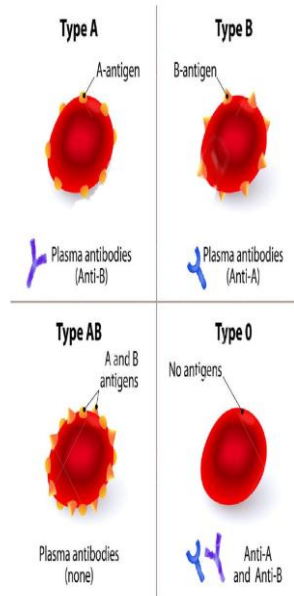
## ABO System:

**Group A:** antigen A on RBC membrane anti B in plasma.

**Group B:** Antigen B on RBC membrane Anti A in plasma.

**Group AB:** Antigen A and B on RBC membrane NO antibodies in plasma.

**Group O:** NO antigen on RBC membrane both Anti A and Anti B in plasma.



# Rhesus Blood Group (Rh)

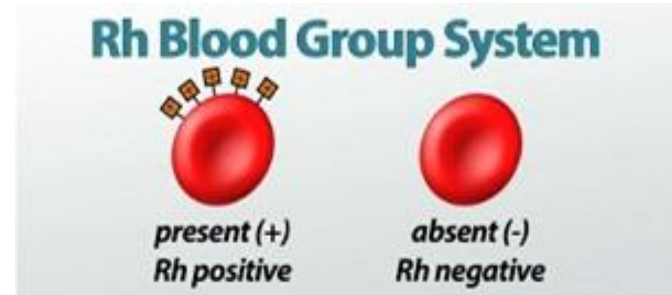
## Rhesus antigen

1. Rhesus **positive**






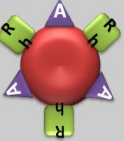

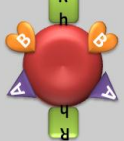
(Rh+ve):  
Antigen D on RBC  
(96-98%).

2. Rhesus **negative**

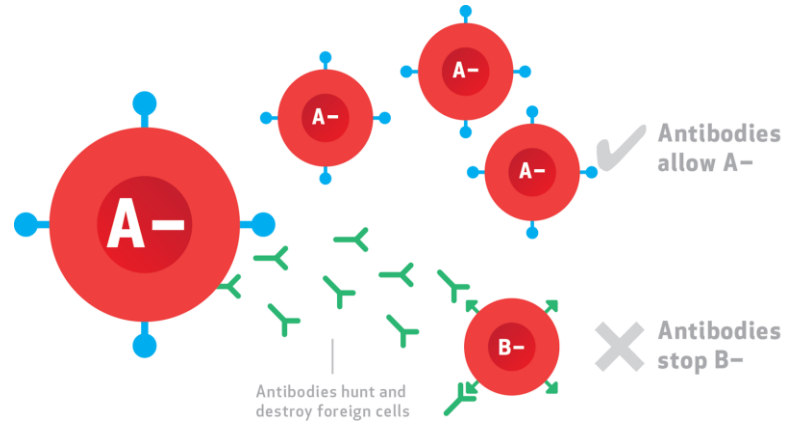
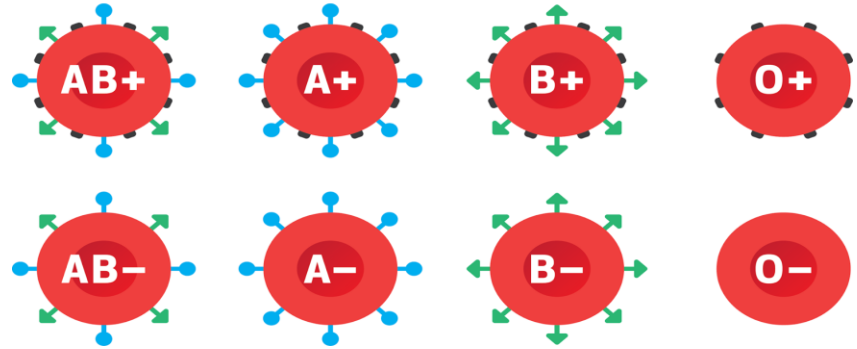
(Rh-ve): NO  
Antigen D on RBC  
(2-4%).



# Blood groups Antigen

<b>O-</b> 	<b>A-</b> 	<b>B-</b> 	<b>AB-</b> 
<b>O+</b> 	<b>A+</b> 	<b>B+</b> 	<b>AB+</b> 

## Blood Types



# Materials

- High titer anti-A, anti-B and anti-D sera.



- A grease pencil.



- Microscope slides.



- Alcohol swab and pricker.



# Procedure

- Prick a finger and place one drop of blood in each of the compartments A, B and D (these are clearly labeled on the microscope slides provided).

- Quickly add a drop of anti-A, anti-B and anti-D-sera to each compartment

- Mix the serum with the drop of blood by moving the slides gently for a minute or two, then examine the mixtures for signs of RBC agglutination or clump formation.

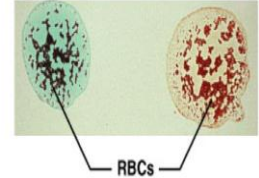
غير مهمه ، ارجعوا  
للفيديوهات افضل  
بسلاميد ١٧

**Blood being tested**

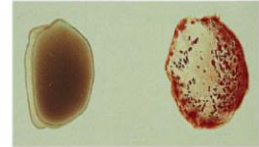
**Serum**

Anti-A      Anti-B

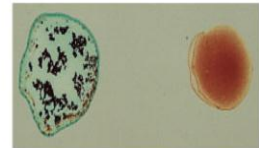
Type AB (contains agglutinogens A and B)



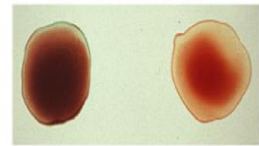
Type B (contains agglutinin B)



Type A (contains agglutinin A)



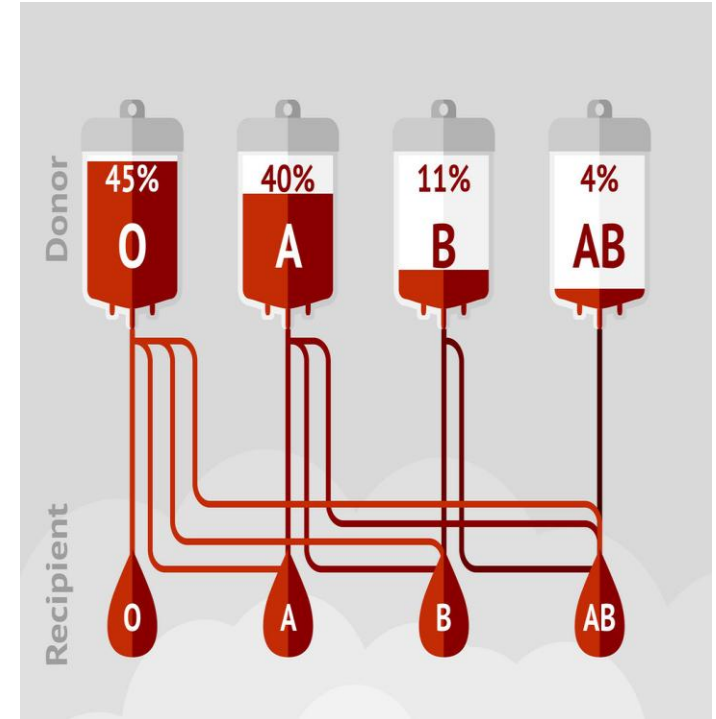
Type O (contains no agglutinogens)



# Blood groups

Dr note: this is the most important thing in the lecture

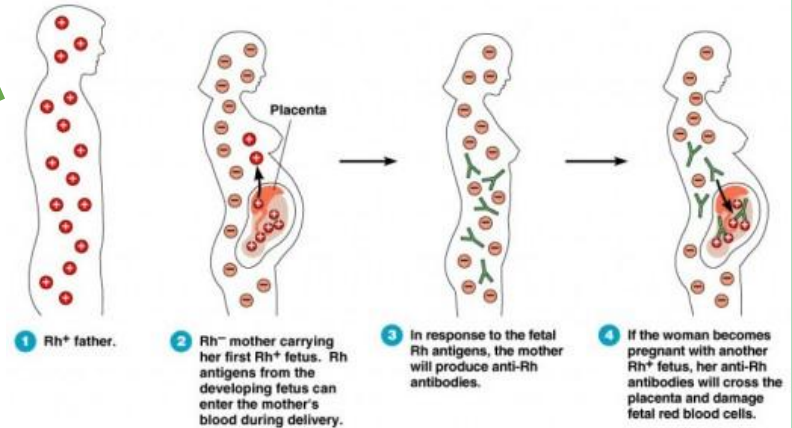
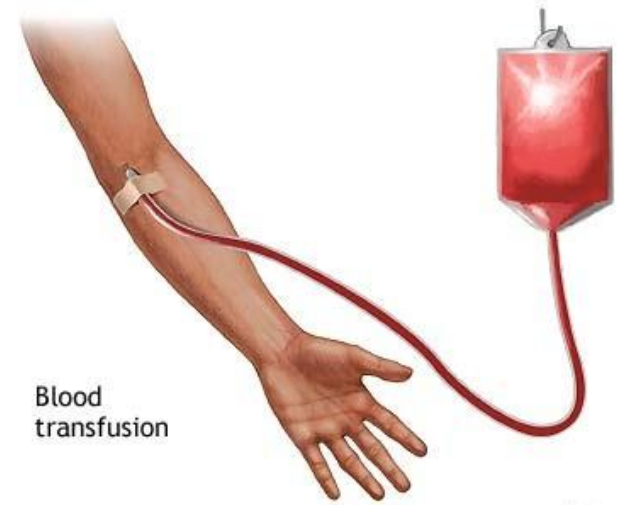
Blood type	Antigens on blood cells	Antibodies made by the immune system	Can donate blood to	Can receive blood from
O-	None	Anti-A, Anti-B, Anti-Rh	All blood types	O- only
O+	Rh	Anti-A, Anti-B	Any Rh+ blood types	O- or O+
A-	A	Anti-B, Anti-Rh	Any A or AB	O or A-
A+	A, Rh	Anti-B	A+ or AB+	Any O or A
B-	B	Anti-A, Anti-Rh	Any B or AB	B- or O-
B+	B, Rh	Anti-A	B+ or AB	Any O or B
AB-	A, B	Anti-Rh	Any AB	Any Rh-
AB+	A, B, Rh	None	AB+	All blood types



# Clinical Application

Important in the following conditions:

- Blood transfusion.
- Hemolytic disease of the newborn (HDN).
- Blood products.





# Clotting time







The time required for blood to form a clot.

- The normal coagulation time in glass tubes is **3 to 10 minutes**.
- The whole blood clotting time is a rough measure of all **intrinsic clotting factors** in the absence of tissue factors.
- Used in diagnosis of **hemophilia**.
- Its chief application is in monitoring

anticoagulant therapy.

Prolonged clotting time of the blood

# Materials

- Capillary tubes of uniform size (non heparinized) 
- A petri-dish. 
- Alcohol swabs. 
- Cotton wool. 
- Plasticine. 
- A water bath set at 37°C. 

# Procedure

غير مهمه ، ارجعوا  
للفيديوهات افضل  
بسلاميد ١٧

- Clean finger with alcohol swap, prick it with lancet and **note the time** that the prick is made.
- Wipe away the first drop of blood. Then while the blood is still flowing freely place one end of a capillary tube in the blood. Holding the tube horizontally let it fill by capillary action, fill more than one tube.
- Close the end of the capillary tube with plasticine. Place the tube in the water bath. Two minutes after making the puncture, break a capillary tube and separate the two halves slowly.
- Repeat the procedure at 30 second intervals with the remaining tubes.
- When the blood forms a continuous thread -like clot between the broken ends of the tube, the end-point has been reached, note the time.
- The time from pricking the finger to the appearance of the clot is the **clotting time**.



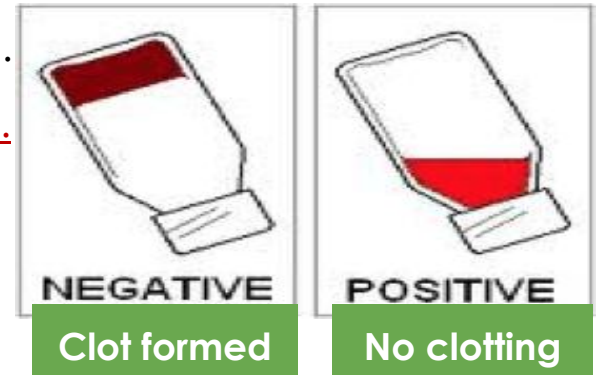


# Results

- Usually the clotting time measured by this method is in the **range 3-6 minutes**.
- Prolong clotting time seen in deficiencies in the intrinsic coagulation pathway.
- Example: **hemophilia** due to deficiency of Factor VIII (8).

## Clotting Time using Test Tube Method

- Place 2 ml blood into non heparinized test tube incubated in water bath.
- Every 30 second invert gentle to check for clot formation.
- Time from pricking finger to clot formation is **clotting time**.
- Normally 6-10 min by this method
- Measurement of the clotting factors are better used.

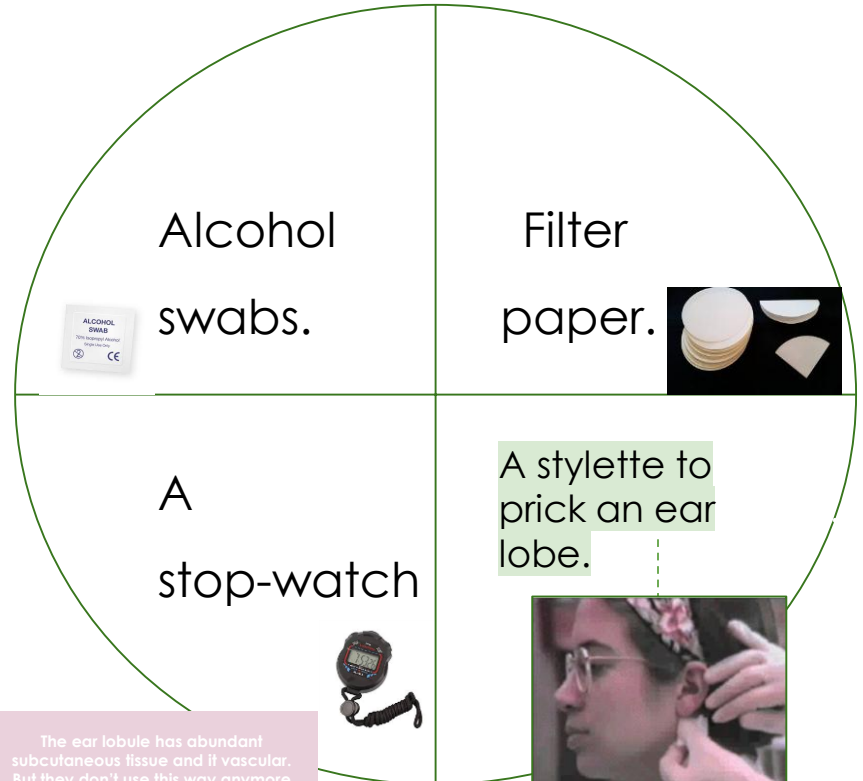


# Bleeding Time

- The time taking for bleeding to stop (time for a platelet plug to form).
- Bleeding time is a test of **platelet function**.
- The **template bleeding time** is used when the test is performed by standard template method.



# Materials



The ear lobe has abundant subcutaneous tissue and it vascular. But they don't use this way anymore because results may vary, and could cause local hematoma.



# Procedure

- Clean the lobe of the ear with an alcohol swab.

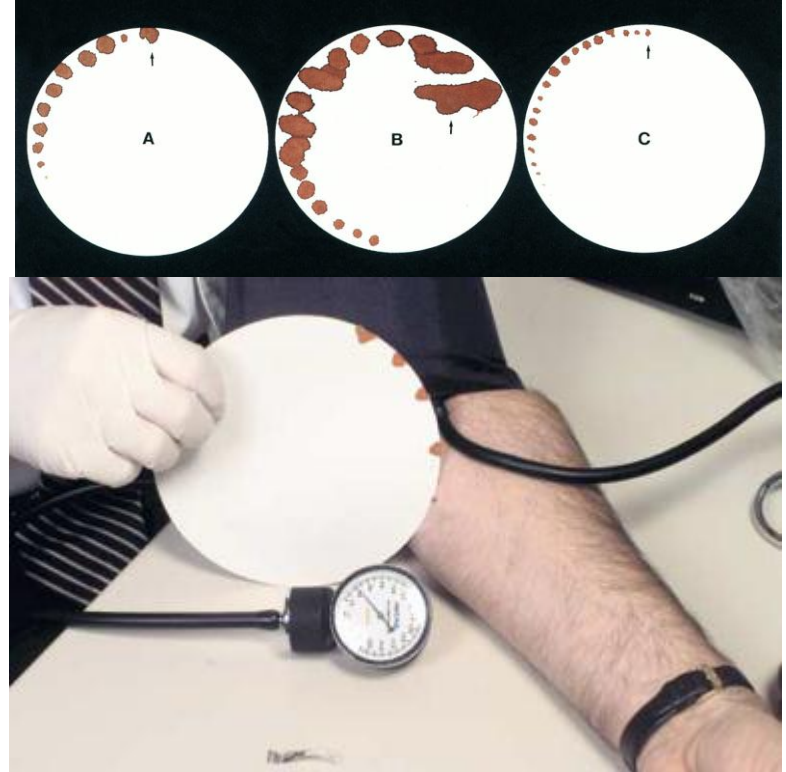
- When it is dry, make a single puncture with a stylette (about 3mm deep).

اتمنى محد يتحمس ويزيد  
العمق بعدين يصير  
النزيف اللي شفتاه باللاب



- Note the **time at which the puncture** is made.

- The skin of the ear should not be touched once the puncture has been made until the experiment is over.



# The Standardized Template Method

- A **sphygmomanometer cuff** is applied to the subject's arm and inflated to 40mmHg.
- The volar surface is cleaned with 70% alcohol.
- A sterile metal template with a linear slit (11mm long) is pressed firmly against the skin.
- A scalpel blade, with a guard, is carefully introduced so that it protrudes 1mm through the template slit. An incision, 1mm deep and 9mm long can then be made.
- Blood is gently, but completely removed with filter paper at 15 second intervals until the bleeding stops.
- Normal bleeding times determined with this method are in the range **2.5-9.5 minutes**.

## Note:

• If the bleeding time **exceeds 15 minutes**:

- Stop the procedure.
- Apply pressure to stop the bleeding.
- Report as greater than 15 min.

# Clinical Application

Bleeding time is prolonged in the following conditions:

Platelet dysfunction.

Thrombocytopenia.

Vitamin K deficiency.

Medications: **Aspirin**.

Von Willebrand disease

**works by** is binding to other proteins, in particular factor VIII, and it is important in platelet adhesion to wound sites by mediating the adherence of platelets



بكذا نكون خالصنا من القسيو  
البر اكنيكال الله يوفقكم بالاختبار





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"ما تراه الآن ليس إلا انعكاساً لما فعلته في الماضي، وما ستفعله في المستقبل ليس إلا انعكاساً لما تفعله الآن"

# PHYS OLOGY

*438 practical team*



Team members

GOOD LUCK

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- **Tarfah Alkaltham**
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