



IMMUNOLOGY FIRST COURSE

BLOOD GROUPING TEST

Sawa University

جامعة ساوة الاهلية

College of health and medical techniques

كلية التقنيات الصحية والطبية

Department of Medical Laboratories

قسم تقنيات المختبرات الطبية

Third Stage

المرحلة : الثالثة

محاضرة رقم 6

الجانب العملي

Lecture No. 6

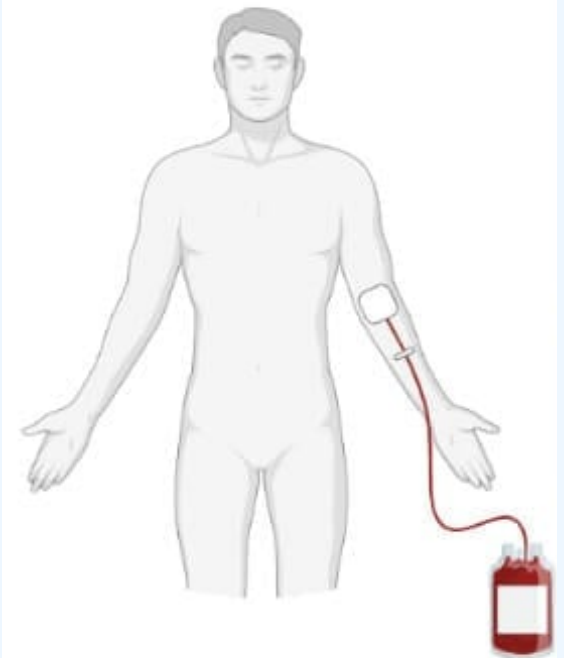
Practical

تدريسي المادة : م.د عبد الرحمن سالم قاطع

OBJECTIVES

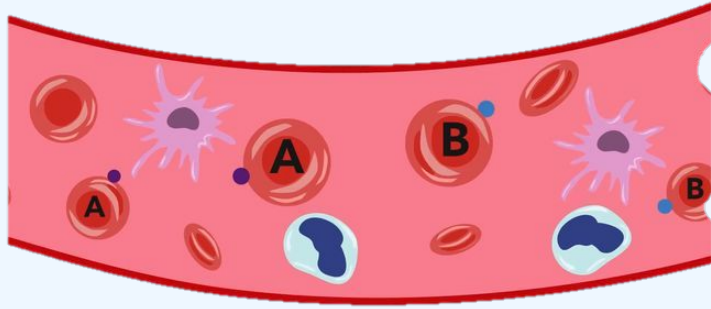
- To describe different **types** of blood groups.
- To understand **cross matching**
- To know safe blood **transfusion**
- To understand **RH factor**

Blood Group



Introduction

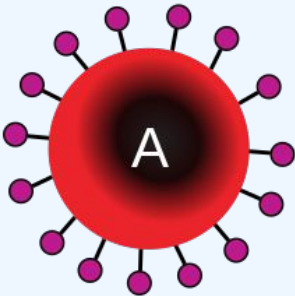
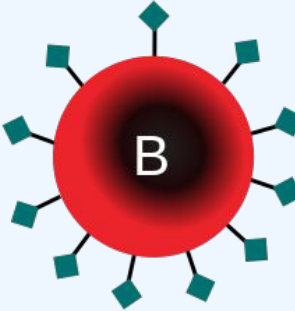
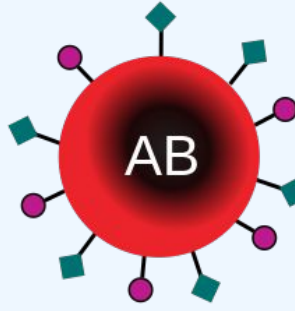
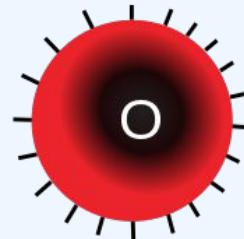
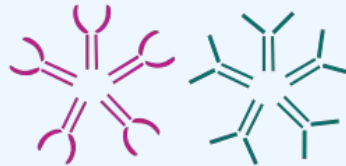
- A blood type (**blood group**) is a classification of blood based on the presence or absence of **inherited antigenic substances (antigens)** on the surface of red blood cells (RBCs).
- **Antigen**: is a **Marker** – protein or carbohydrate molecule that found at the cell surface.
- **Antibody**: substances produced by immune system (**Y shape**)



ABO blood group

- . Blood is characterized into different blood groups, based on the **presence** or **absence** of these **antigens** or **agglutinogens**
- . Which called **A and B** – depending on whether the RBCs have **none**, only **one** or **both** antigens, blood groups are distinguished as **type O, type A, type B, or type AB.**

ABO group system

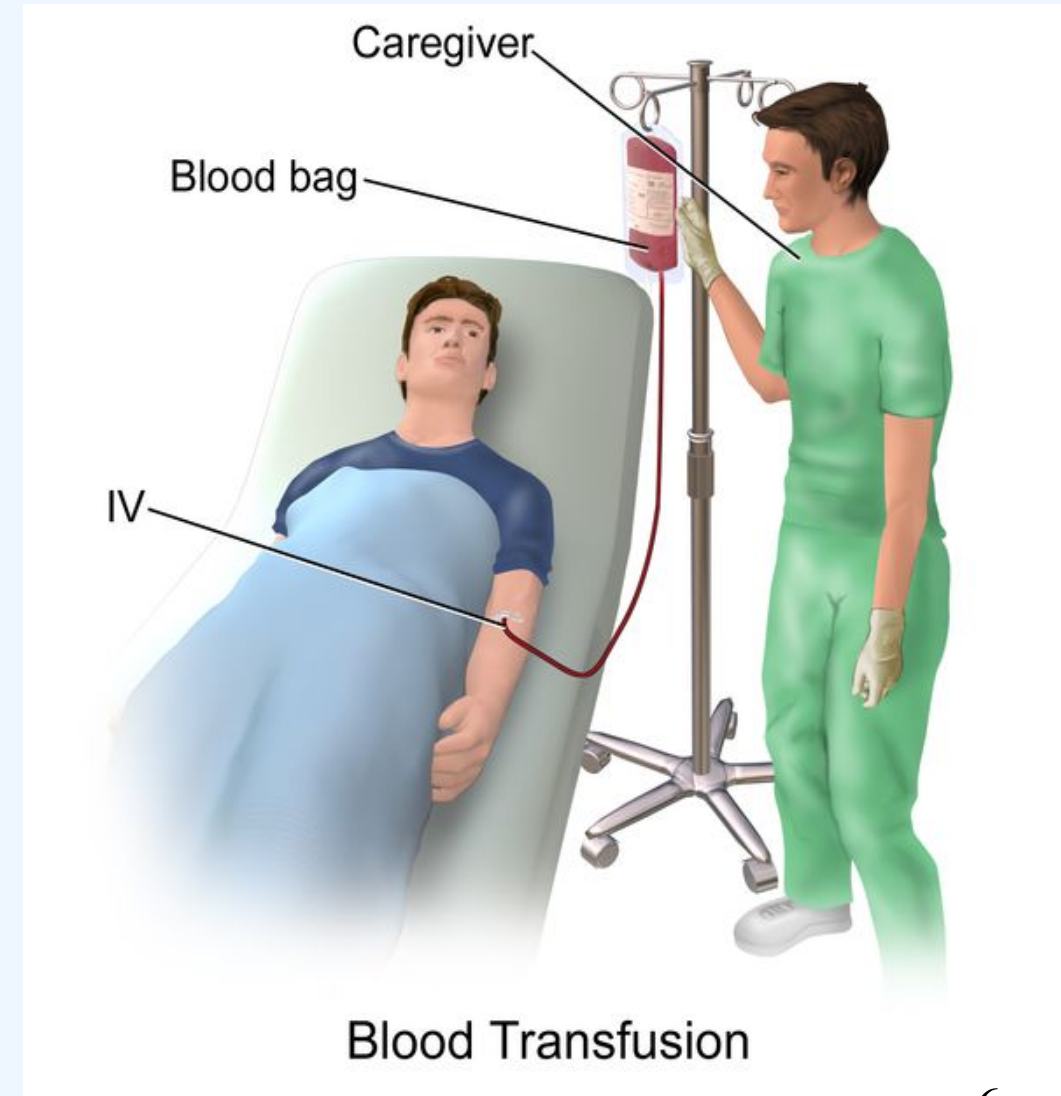
	Group A	Group B	Group AB	Group O
Red blood cell type				
Antibodies in plasma	 Anti-B	 Anti-A	None	 Anti-A and Anti-B
Antigens in red blood cell	 A antigen	 B antigen	 A and B antigens	None

What is the Purpose of blood typing?

✓ It is the Blood transfusion

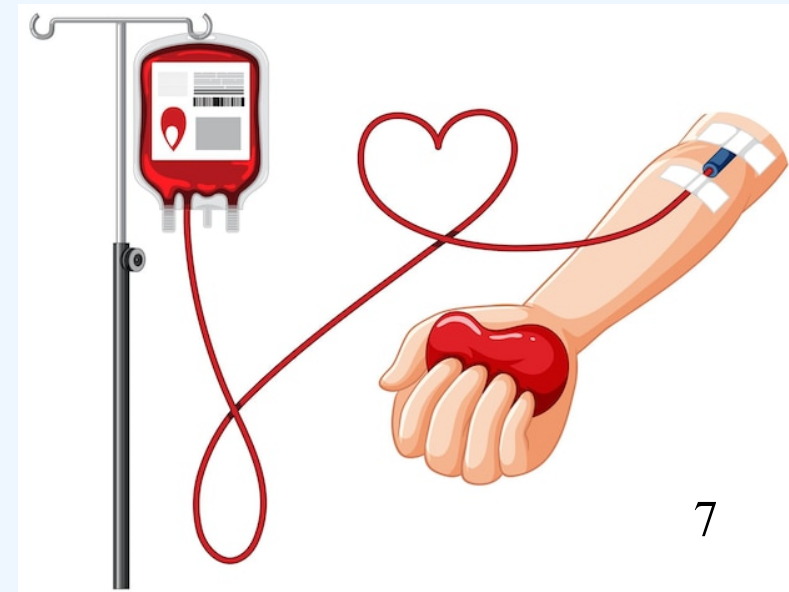
Which is a life-saving procedure in all cases of severe loss of blood, and in life-threatening anemias.

However, blood can only be given after blood grouping which is an essential requirement before blood is given to any individual

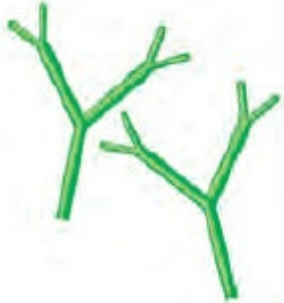


Agglutination

- ❖ If someone receives blood of the wrong type, the worst problem is the reaction of the recipient's antibodies on the donor's RBCs.
- ❖ When the body encounters a foreign antigen, **agglutination** occurs.
- ❖ **Agglutination:** is the clumping of RBCs due to binding of antibodies to antigen, and causes blockage of blood vessels and eventually death.
 - ❖ In your blood, you have antibodies for the antigens you don't have

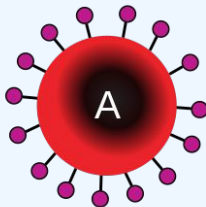
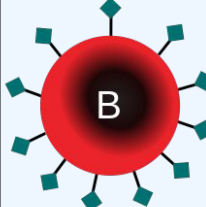
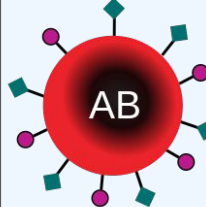
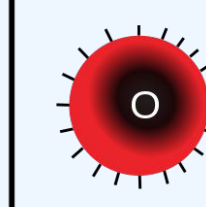
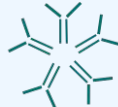
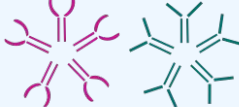


Agglutination Reaction

	Antigen A	Antigen B	Antigens A and B	Neither antigen A nor antigen B
Red blood cells				
Plasma			Neither anti-A nor anti-B antibodies	
	Type A Red blood cells with type A surface antigens and plasma with anti-B antibodies	Type B Red blood cells with type B surface antigens and plasma with anti-A antibodies	Type AB Red blood cells with both type A and type B surface antigens and neither anti-A nor anti-B plasma antibodies	Type O Red blood cells with neither type A nor type B surface antigens but both anti-A and anti-B plasma antibodies

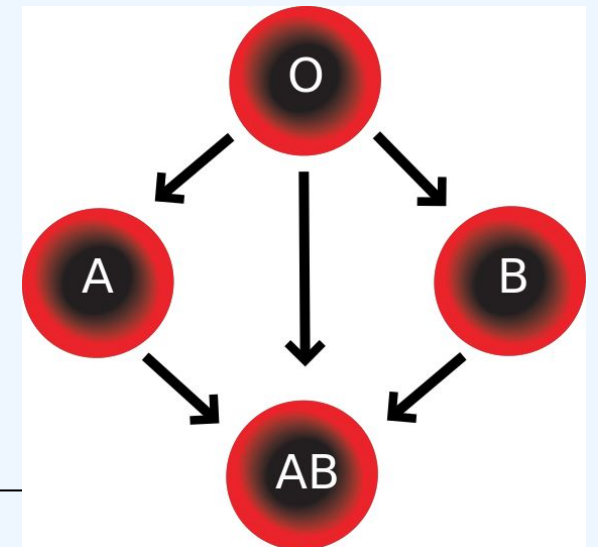
Blood Groups

Blood Group	Antigens	Antibodies	Can give blood (RBC) to	Can receive blood (RBC) from
AB	A and B	None	AB	AB, A, B, O
A	A	B	A and AB	A and O
B	B	A	B and AB	B and O
O	None	A and B	AB, A, B, O	O

	Group A	Group B	Group AB	Group O
Red blood cell type				
Antibodies in plasma	 Anti-B	 Anti-A	None	 Anti-A and Anti-B
Antigens in red blood cell	 A antigen	 B antigen	 A and B antigens	None

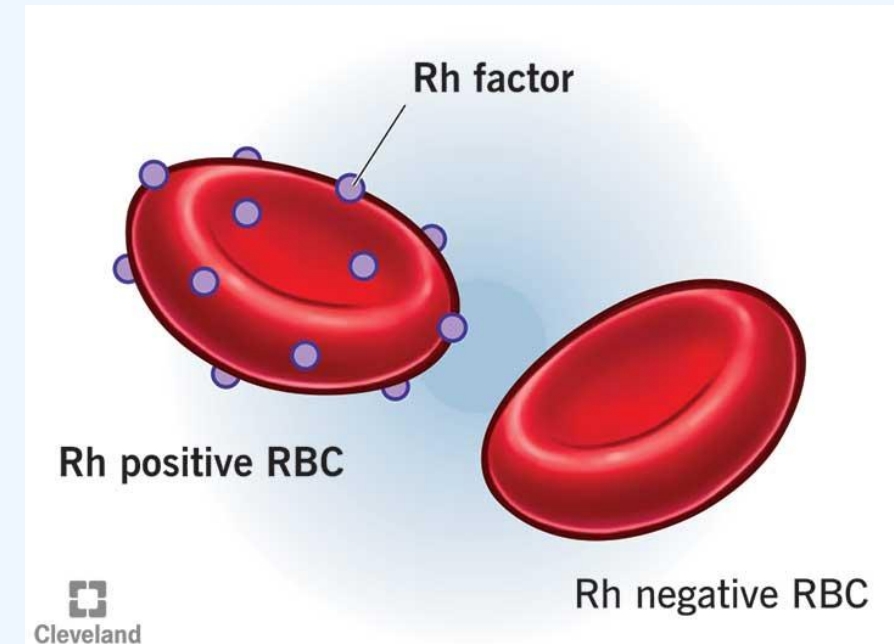
What is meant by the terms universal donor and universal recipient?

- Since type **O persons** do not have either A or B antigens on their red cells, they are called “universal donors” because their blood can, theoretically, be given to all 4 blood types.
- Type **AB persons** are called “universal recipients” because they do not have circulating agglutinins in their plasma and can, therefore, receive blood of any type.



RH factor

- In addition to antigens of ABO system, the red cells of humans also contain an additional antigen, called **Rh antigen (or Rh factor)**.
- Persons whose red cells contain this additional antigen are called **“Rh positive” (Rh +)** while those who lack this antigen are called **“Rh negative” (Rh –)**.
- there are no natural anti-Rh antibodies, and they never develop spontaneously, they can be produced only in Rh–ve persons.
This can happen in either of 2 ways:
 - 1- In transfusions
 - 2- In pregnancy



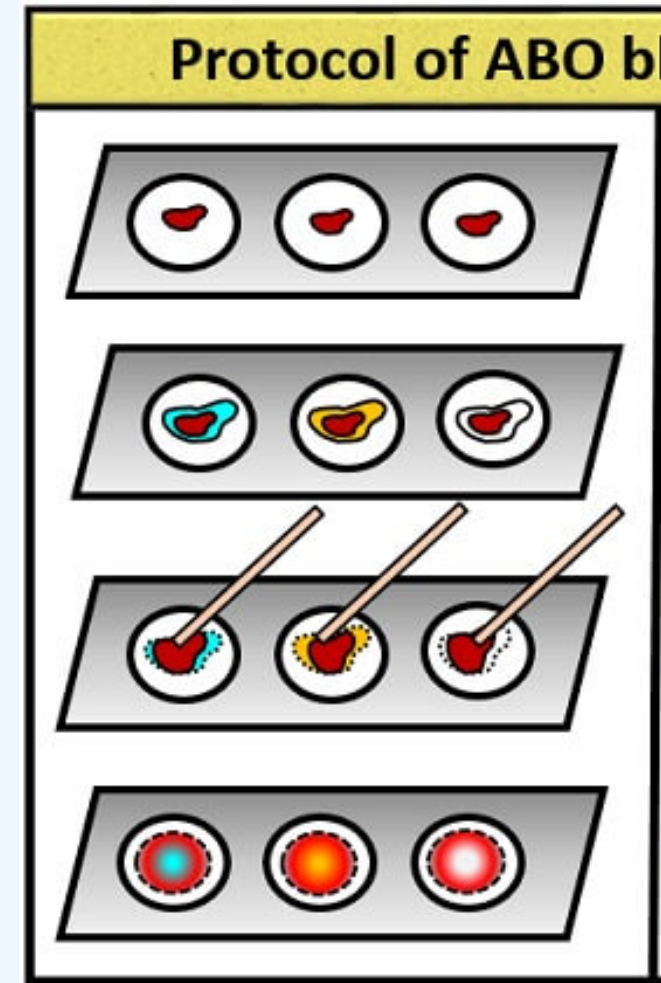
APPARATUS AND MATERIALS

1. Sterile blood lancet, Sterile cotton,
2. Alcohol and Toothpicks.
3. Clean, dry microscope slides.
4. Anti-A serum
5. Anti-B serum
6. Anti-D (anti-Rh) serum



Procedure

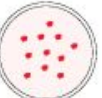
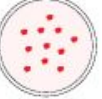
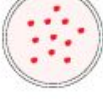
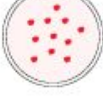
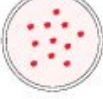
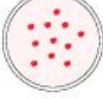
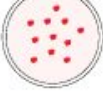
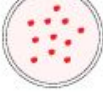
1. **Clean the finger** with alcohol and let it to dry.
2. **Prick finger with lancet** ,You will need three fairly large drops of blood.
3. Use one slide for ABO typing and Rh factor. **Place three drops of blood on the slide**, add the typing serum.
4. Mix the antibody serum with the blood and wait for 2-3 minutes , then note the result.



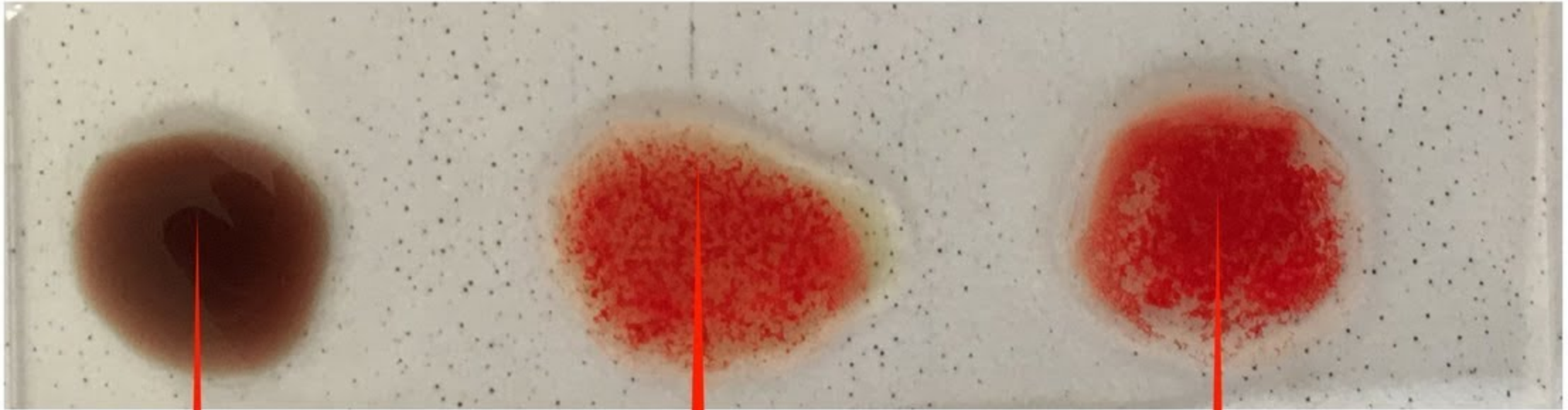
** Be sure the serum dropper does not touch the drop of blood. Results should be readable in about a minute.*

Blood Group Testing



Anti-A	Anti-B	Anti-D	Control	Blood type
				O-positive
				O-negative
				A-positive
				A-negative
				B-positive
				B-negative
				AB-positive
				AB-negative
				Not valid

BLOOD GROUP DETERMINATION



A Remain Same as Earlier

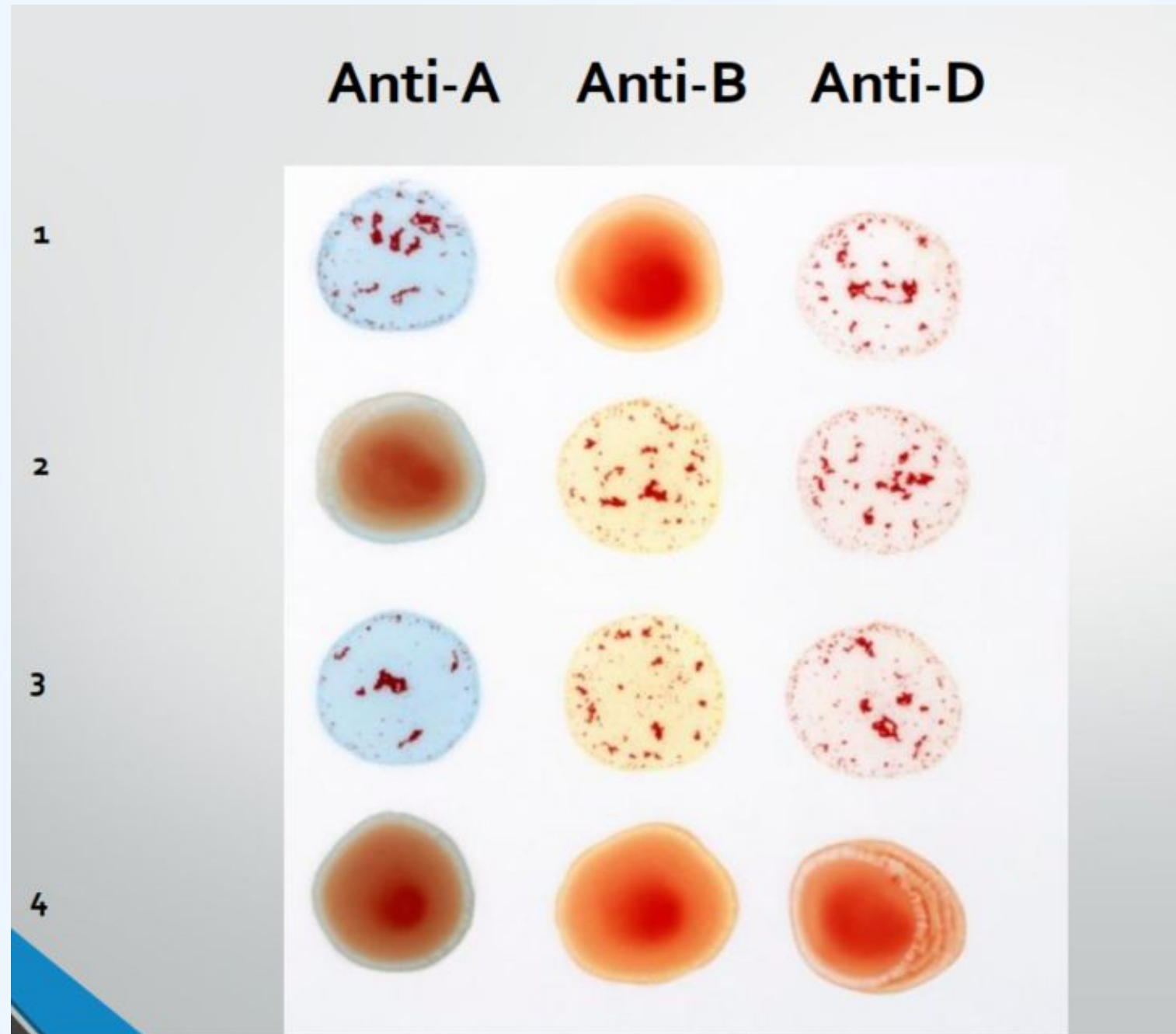
B Shows Agglutination

D Shows Agglutination so its +

Final Result- The Blood Group is B+ (B Positive)

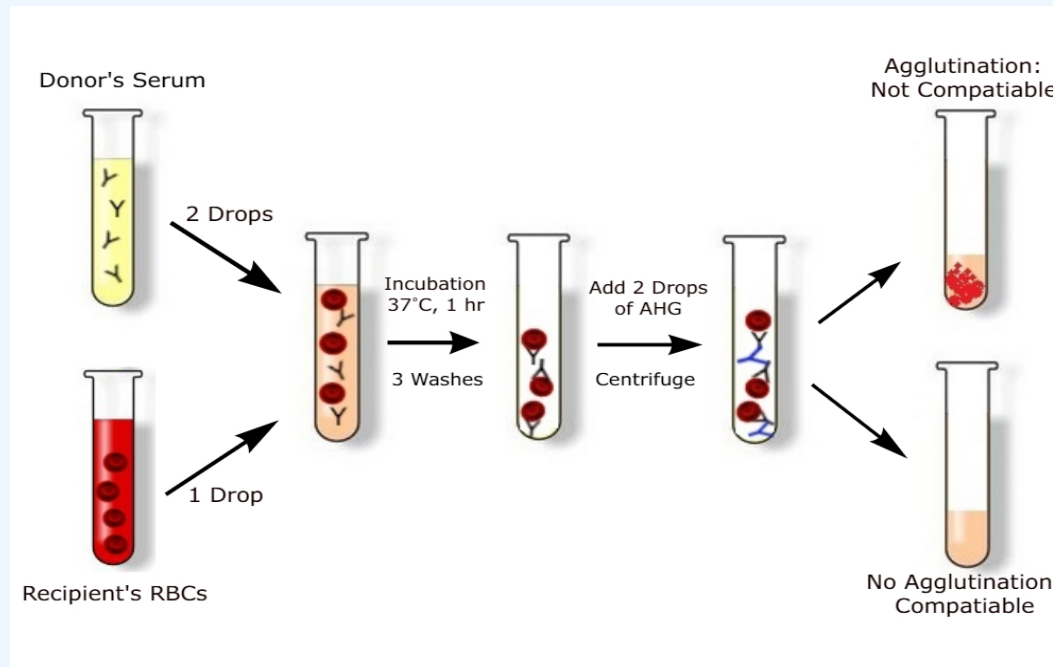


Training



What is cross matching?

- in transfusion medicine, refers to the test that is performed prior to a blood transfusion in order to **determine if the donor's blood is compatible with the blood of an intended recipient.**
- Cross-matching is also used to determine compatibility between a donor and recipient, in **organ transplantation or blood transfusion.**



Any questions?

*Thank
You*