

Agglutination Reactions

3- Blood Group Test

Blood type tests are done before a person gets a blood transfusion and to check a pregnant woman's blood type. Human blood is typed by certain markers (called antigens) on the surface of red blood cells. Blood type may also be done to see if two people are likely to be blood relatives.

The most important antigens are blood group antigens (ABO) and the Rh antigen. So the two most common blood type tests are the ABO and Rh tests.

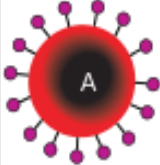
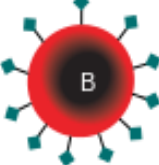
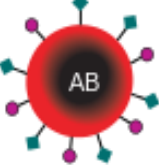
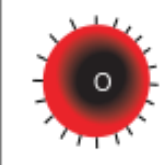






ABO test

The ABO test shows that people have one of four blood types: A, B, AB, or O. If your red blood cells have:

- The A antigen, you have type A blood. The liquid portion of your blood (plasma) has antibodies that fight against type B blood.
- The B antigen, you have type B blood. Your plasma has antibodies that fight against type A blood.
- Neither the A nor B antigen, you have type O blood. Your plasma has antibodies that fight against both type A and type B blood.

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- Both the A and B antigens, you have type AB blood. Your plasma does not have antibodies against type A or type B blood. (Table1)

	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

(Table1) :Blood type (or blood group)

Blood received in a transfusion must have the same antigens as yours (compatible blood). If you get a transfusion that has different antigens (incompatible blood), the antibodies in your plasma will destroy the donor blood cells. This is called a transfusion reaction, and it occurs immediately when incompatible blood is transfused. A transfusion reaction can be mild or cause a serious illness and even death.

Type O-negative blood does not have any antigens. It is called the "universal donor" type because it is compatible with any blood type. Type AB-positive blood is called the

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"universal recipient" type because a person who has it can receive blood of any type.

Rh test

Rh blood type checks for the Rh antigen (also called the Rh factor) on red blood cells. If your red blood cells:

- Have the Rh antigen, your blood is Rh-positive.
- Do not have the Rh antigen, your blood is Rh-negative.

Why It Is Done

A blood type test is done:

- Before a person gets a blood transfusion.
- Before a person donates blood.
- Before a person donates an organ for transplantation.
- Before surgery.
- When a woman is planning to become pregnant or first becomes pregnant.
- To show whether two people could be blood relatives.

Results

- Blood type tests are done before a person gets a blood transfusion and to check a pregnant woman's blood type Figure (1). The following (Table 2) shows the compatibility of blood types between blood donors and recipients.
- Read the (Table 2) as follows.

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Blood types that match	
A person who has:	Can receive:
A- blood	A-, O- blood
A+ blood	A-, A+, O-, O+ blood
B- blood	B-, O- blood
B+ blood	B-, B+, O-, O+ blood
AB- blood	AB-, O- blood
AB+ blood	AB-, AB+, A-, A+, B-, B+, O-, O+ blood
O- blood	O- blood
O+ blood	O-, O+ blood

- (Table 2): shows the compatibility of blood types between blood donors and recipients.

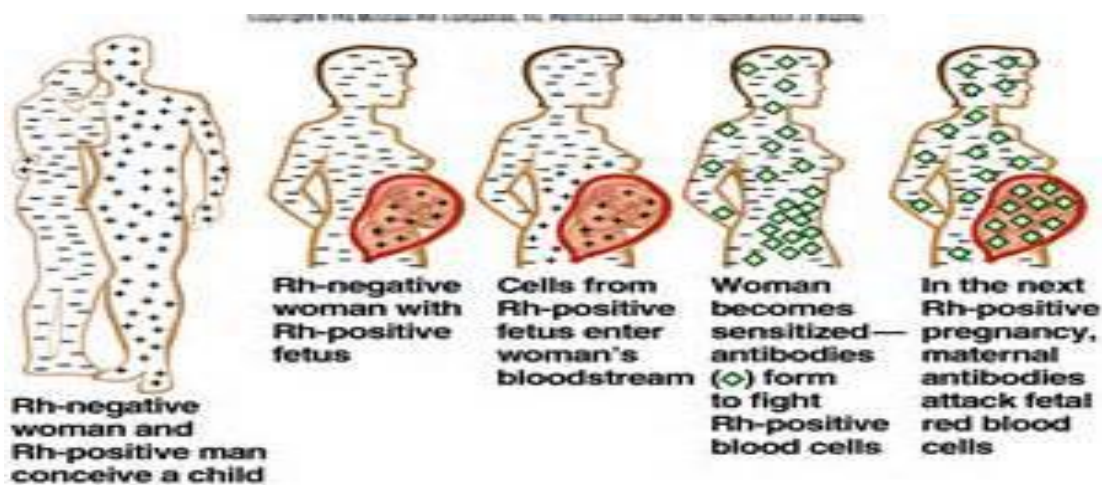


Figure (1) : Rh- pregnant woman's

Phenotype and Genotype

Blood Groups				
Phenotype (Blood Type)	Genotype	Antigen on Red Blood Cell	Safe Transfusions	
			To	From
A	$I^A I^A$ or $I^A i$	A	A, AB	A, O
B	$I^B I^B$ or $I^B i$	B	B, AB	B, O
AB	$I^A I^B$	A and B	AB	A, B, AB, O
O	ii	none	A, B, AB, O	O

(Table 3): Phenotype and Genotype

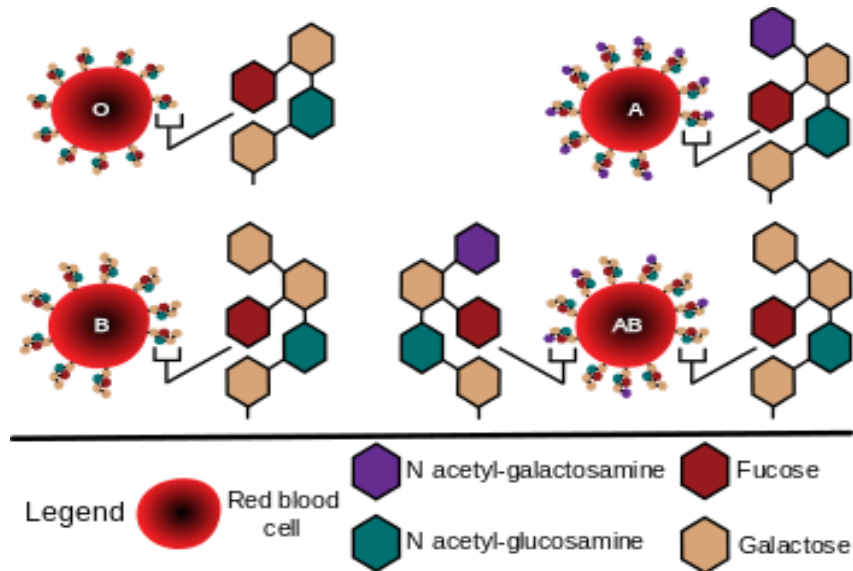


Figure (2) ABO blood group system: diagram showing the carbohydrate chains that determine the ABO blood group

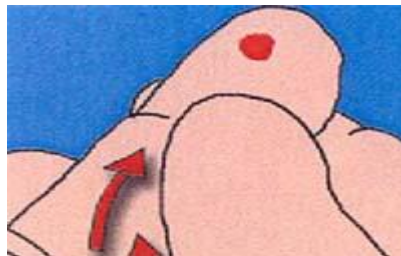
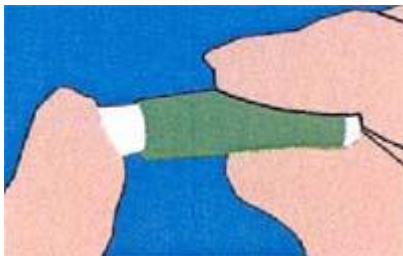
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Test contents:

- **Instruction leaflet**
- **Blood group test card**
- **Blood group (Anti-A & Anti-B & Anti-D) Figure (5)**
- **Lancets**
- **Plastic stike**

Instructions for use.

1. Perform test at room temperature
2. Wash your hands before carrying out the test and again after carrying out the test.
3. Place the lancet against the end of the finger. Figure (3)
4. Massage the finger from the bottom to the top to encourage bloodflow. Press the blood towards fingertip. Repeat pressing until a drop with a 3 to 4 mm is seen. Figure (4)



• **Figure (3)**

Figure (4)

5. You will see the blood flowing slowly to the bottom of the circle. Repeat this procedure the card on the 3 circles on card.
6. Add Anti-A and Anti-B and Anti-D on the 3 circles on card.
7. Mix for 2 min.
8. As soon as you have finished read and record the results . See the(table 4) below for how the results are interpreted.

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Anti-A	Anti-B	Anti-D	Control	Blood Type
●	●	●	●	O-pos
●	●	●	●	O-neg
●	●	●	●	A-pos
●	●	●	●	A-neg
●	●	●	●	B-pos
●	●	●	●	B-neg
●	●	●	●	AB-pos
●	●	●	●	AB-neg
●	●	●	●	Not valid

Table 4: Bblood group



Figure (5):Bblood group Test

مختبر كلية العلوم للبنات للتحليلات المرضية
(College Of Science For Women Medical Laboratory)

الجادرية - جامعة بغداد- كلية العلوم للبنات - قسم علوم الحياة - مختبر المناعة.

Referred by:

Date:

Patient's Name:

Age:

Hematology

Red Blood Cells:

P.C.V: %
Hb: g/dl
R.B.C: $\times 10^{12}/L$
ABO & Rh
PT , PTT & Bleeding time

White Blood cells:

Total: $\times 10^9/L$
Differential:
Neutrophils: %
Lymphocytes: %
Monocytes: %
Eosinophils: %
Basophils: %

E.S.R: mm/1hr. (Westergreen)

Platelets $\times 10^9/L$

Blood Film:

Faithfully yours

