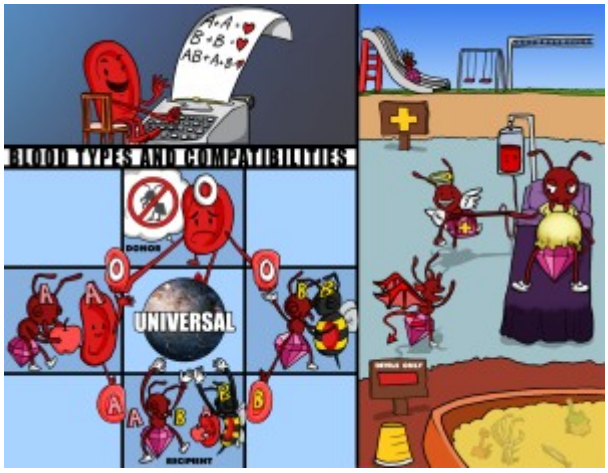
Blood Types and Compatibilities

Blood types are classifications based on the presence or absence of inherited antigenic substances on the surface of red blood cells. Understanding the differences between ABO compatibility and Rh compatibility is important when administering blood to a patient and when caring for pregnant women who are Rh negative.



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ABO Compatibility

No Antigens (Type O Blood)
No Ant-gems with O Blood-cell
Blood group O individuals do not have either A or B antigens on the surface of their RBCs, and their blood serum contains IgM anti-A and anti-B antibodies against the A and B blood group antigens. Thus, an individual with type O blood can receive blood ONLY from another group O individual.

Universal Donor
Universally Donating
Because those with type O blood do not have any antigens, they can donate blood to individuals of any group (A, B, AB, or O) and thus are known as universal donors.

A Antigen (Type A Blood)
A Ant-gem with A-apple Blood-cell
Blood group A individuals have the A antigen on the surface of their RBCs and blood serum containing IgM antibodies against the B antigen. Thus, type A can receive blood only from individuals of groups A or O, and can donate blood to those with type A or AB.

B Antigen (Type B Blood)
B Ant-gem with B-Bee Blood-cell
Blood group B individuals have the B antigen on the surface of their RBCs and blood serum containing IgM antibodies against the A antigen. Thus, type B can receive blood only from individuals of groups B or O, and can donate blood to those with type B or AB.

AB Antigen (Type AB Blood)
AB Ant-gem with Apple-Bee Blood-cell
Blood group AB individuals have both A and B antigens on the surface of their RBCs and their blood plasma does not carry any antibodies against either A or B antigen. Thus, an individual with type AB blood can receive blood from any group.

Universal Recipient
Universally Recieving
Because those with type AB blood can receive blood from any group, but cannot donate blood to any group other than AB, they are known as universal recipients.

Rhesus (Rh) Compatibility

Rh (Rhesus) Antigen
Recess-playground Ant-gem
The Rh antigen (factor) is a protein found on the covering of red blood cells. If the red blood cells have this protein, one is Rh positive. If the blood cells do not have this protein, one is Rh negative.

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Never Rh+ to Rh-

Stopping Recess-positive-angel from going to Recess-negative-devil

Because Rh compatibility is required for blood transfusion, never give Rh-positive blood (eg. RBCs express the Rh antigen) to a patient who is Rh-negative.

Considerations

Blood Transfusion

Blood Transfusion-IV

ABO compatibility and Rh compatibility are required for the transfusion of blood products. The correct patient and correct blood type must be determined by drawing blood samples from both the donor and recipient. If the blood is not compatible, a life-threatening transfusion reaction can occur.

Obstetric Patient

Pregnant-patient

An Rh-negative mother may develop antibodies to an Rh-positive baby, which can lead to hemolytic disease of the newborn. To prevent this from happening, RhoGAM is given to the pregnant woman whose blood type is Rh-negative to prevent her from making antibodies to the neonate's blood. An injection of RhoGAM can prevent sensitization of an Rh-negative mother. RhoGAM may be given during pregnancy, following a miscarriage or abortion, after delivery, and after a blood transfusion.

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