

Blood Groups Disorders

EQ: Why is knowing your blood type so important?

I. Blood Genotypes

Blood Type	Genotype	Can Receive Blood From:
A	$i^A i^A$ $i^A i$	A or O
B	$i^B i^B$ $i^B i$	B or O
AB	$i^A i^B$	A, B, AB, O
O	ii	O

- a.
- b. Remember Punnett Squares
 - i. Type A (genotype AA) x Type O (genotype OO)

II. Blood Phenotypes

- a. →
- b. Frequency of Blood Types Worldwide
 - i. A+ → 35%
 - ii. A- → 6.3%
 - iii. B+ → 8.5%
 - iv. B- → 1.5%
 - v. AB+ → 3.4%
 - vi. AB- → 0.6%
 - vii. O+ → 37%
 - viii. O- → 6.6%





III. Rh Blood Groups

- a. Most people have the antigen and are Rh+
- b. If an Rh- person receives blood from an Rh+ donor then Hemolysis takes place
- c. Hemolysis is rupture of RBCs
- d. Rh Factor and Pregnancy
 - i. Problem:
 1. When a fetus is Rh+ and the mother is Rh-
 2. this can cause the mother's immune system to attack the fetus.
 - ii. There are drugs that will suppress this reaction

IV. Hemostasis

- a. The process of stopping bleeding

ABO blood group system

				
Red blood cell type	A	B	AB	O
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

- b. Involves the coagulation and clotting of the blood to seal the site of damage
- c. THREE EVENTS IN HEMOSTASIS
 - i. Blood Vessel Spasm
 - 1. Serotonin = vasoconstrictor
 - ii. Platelet plug formation
 - iii. Blood coagulation
 - 1. conversion of fibrinogen to fibrin
 - 2. thrombin is enzyme that causes the conversion
 - iv. THROMBUS – blood clot (abnormal)
 - v. EMBOLUS – when the clot moves to another place.
- V. Blood Disorders
 - a. Hemophilia – “bleeder’s disease”
 - i. Sex linked trait (gene on X chromosome)
 - ii. Missing or low level of blood clotting factors
 - b. Anemia
 - i. Anemia: is a condition in which the body does not have enough healthy red blood cells
 - ii. Anemia has many causes but you do need...
 - 1. Vitamin B-12
 - 2. Folate (another B vitamin)
 - 3. iron
 - c. Sickle Cell Anemia
 - i. Sickle shaped cells rupture easy
 - ii. leave victims gasping for air and in intense pain.
 - iii. Is a homozygous recessive trait – where the heterozygous condition provides resistance to malaria.
 - d. White blood cell diseases
 - i. Leukocytosis
 - 1. Too many WBC’s – caused by an infection in the body.
 - ii. Leukopenia
 - 1. Too few WBC’s in the body.