BLOOD GROUPS AND BLOOD TRANSFUSION

- *Blood group* is applied to any well-defined system of red blood cell antigens which are inherited characteristics
- 20 blood group systems having approximately 400 blood group antigens currently recognized
- ABO and Rhesus (Rh) blood group systems are of major clinical significance
- Other blood group systems are: Lewis system, P system, I system, MNS system, Kell and Duffy system, and Luthern system.
- **ABO SYSTEM.** This system consists of 3 major allelic genes: A, B and O, located on the long arm of chromosome 9.

Web Table 13.4: The ABO Blood Groups.

Blood Group	Antigens on Red Cells	Naturally-Occurring Serum Antibodies
AB	AB	None
A	A	Anti-B
B	B	Anti-A
O	O	Anti-A, Anti-B

RHESUS SYSTEM

- Rh grouping is performed with anti-D antiserum. Individuals who are D-positive are referred to as *Rh-positive* and those who lack D antigen are termed *Rh-negative.*

BLOOD TRANSFUSION

- **Indications for blood transfusion**:

Acute blood loss

Various haematologic disorders

Pretransfusion compatibility testing is essential prior to any blood transfusion

1. ABO and Rh(D) grouping of the patient *(recipient).*
2. *Antibody screening* of the patient's serum to detect the presence of clinically significant antibodies.
3. Selecting the *donor* blood of the same ABO and Rh group.
4. *Cross-matching* the patient's serum against donor red cells to confirm donor-recipient compatibility.

Complications of Blood Transfusion

I. *Immunologic transfusion reactions*
II. *Non-immune transfusion reactions*

IMMUNOLOGIC TRANSFUSION REACTIONS

- 1. Haemolytic transfusion reactions
- 2. Transfusion-related acute lung injury (TRALI)
- 3. Other allergic reactions

NONIMMUNE TRANSFUSION REACTIONS

1. Circulatory overload
2. Massive transfusion
3. Transmission of infection
4. Air embolism
5. Thrombophlebitis
6. Transfusion haemosiderosis

BLOOD COMPONENTS

1. Packed RBCs
2. Platelets
3. Fresh frozen plasma
4. Cryoprecipitate

HAEMOLYTIC DISEASE OF NEWBORN

- Results from the passage of IgG antibodies from the maternal circulation across the placenta into the circulation of the foetal red cells

PATHOGENESIS

Due to Rh-D incompatibility

Due to ABO incompatibility

CLINICAL FEATURES

Severest form: hydrops foetalis

Moderate disease : *kernicterus*

*Mild disease: S*evere anaemia with or without jaundice.

LABORATORY FINDINGS

Cord blood: Positive direct Coombs' test

Mother's blood: Rh-D negative with high plasma titre of anti-D