



**TRANSFUSION
MEDICINE**

PROCUREMENT

MLT job scope: to run Hb screening counter and to make sure all potential donor fulfil following requirement

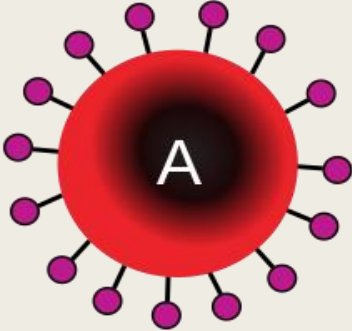
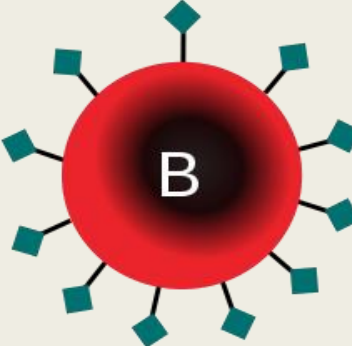
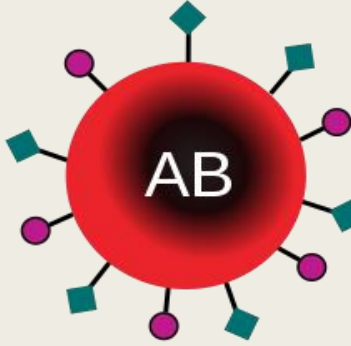
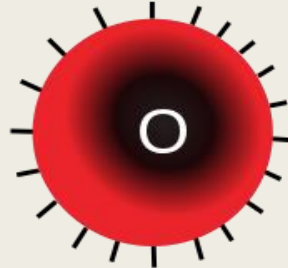
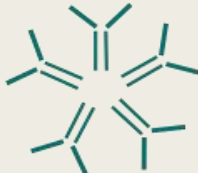

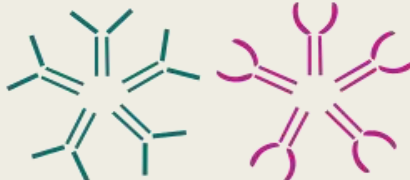



- ❖ Minimum weight 45kg.
- ❖ Hb level 13.5g/dl for men and 12.5 g/dl for women (common method used is hemoglobin meter or copper sulphate method)
- ❖ Maximum Hb is 18 g/dl.

MLT also have to do preliminary blood grouping for donor.(common method used is tile method)

ABO GROUPING

- Initially describe by Karl Landsteiner in 1900
- Remains the most important blood group system in transfusion medicine.
- There are other blood group systems such as MNS system, Kidd system, Duffy system and many more.
- Transfusion of ABO incompatible blood can be associated with acute intravascular hemolysis, renal failure and death.
- In blood ABO antigens are found on red blood cells and ABO antibodies found in plasma.
- ABO typing is determined by the presence or absence of A and/or B antigens on red blood cells, and by the presence or absence of isohemagglutinins (antibodies) anti A and or anti-B in plasma.
- Agglutination will be observed if the test red blood cells/reagent red blood cells contains the antigen directed against the corresponding antibodies.
- An inverse reciprocal relationship exists between ABO antigens on red blood cells and ABO antibodies in plasma. (refer pic)

ABO GROUPING

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

ABO GROUPING

- ABO antigen tested by mixing patient/donor red blood cell with anti-A ,anti-B and anti-AB(forward grouping)
- ABO antibodies tested by mixing patient/donor plasma with A-cell, B- cell and O-cell (reverse grouping).
- Forward and reverse grouping must be interpreted together to avoid any error and detect any discrepancy .

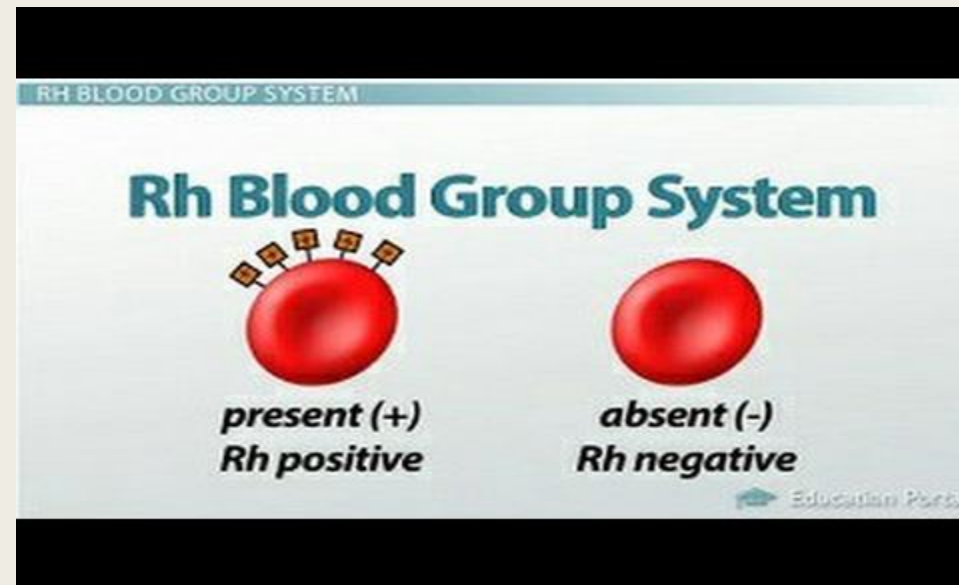
Table 32.2: Showing agglutination reaction in cell and serum grouping

| <i>Cell grouping</i> | | | <i>Serum grouping</i> | | | <i>Interpretation</i> |
|----------------------|---------------|----------------|-----------------------|----------------|----------------|-----------------------|
| <i>Anti A</i> | <i>Anti B</i> | <i>Anti AB</i> | <i>A cells</i> | <i>B cells</i> | <i>O cells</i> | |
| + | - | + | - | + | - | A |
| - | + | + | + | - | - | B |
| + | + | + | - | - | - | AB |
| - | - | - | + | + | - | O |

Where, + = Agglutination present
 - = No Agglutination

Rh GROUPING

- Rh system is most important blood group system after ABO system in transfusion medicine.
- Rh group are determine by presence or absence of antigen D on red blood cell.
- Presence of “D” antigen in the red blood cells tested by using anti 'D' reagent .
- Agglutination of red blood cells signifies presence of “D” antigen in red blood cells.
- All negative reaction must be continued to anti globulin phase for detection of the Du phenotype to confirm absence of the “D” antigen.



METHOD FOR ABO AND RH GROUPING

- Slide/Tile method – suitable for preliminary donor blood grouping.
- Micro titer plate – suitable for large volume of patient/donor
- Automated blood grouping analyzer- suitable for large volume of patient/donor
- Tube method – most suitable for patient blood grouping.
- Gel card method – expensive normally used for ABO discrepancy case/
special cases.

ABO & RH GROUPING

| Forward grouping | | | Reverse grouping | | | Rh grouping | | Interpretation |
|------------------|---------|----------|------------------|--------|--------|-------------|--------|----------------|
| Anti -A | Anti -B | Anti- AB | Cell A | Cell B | Cell O | Rh ctrl | Anti D | |
| 4+ | 0 | 4+ | 0 | 3+ | 0 | 0 | 4+ | A Positive |
| 0 | 4+ | 4+ | 3+ | 0 | 0 | 0 | 4+ | B Positive |
| 4+ | 4+ | 4+ | 0 | 0 | 0 | 0 | 4+ | AB Positive |
| 0 | 0 | 0 | 3+ | 3+ | 0 | 0 | 4+ | O Positive |
| 4+ | 0 | 4+ | 0 | 3+ | 0 | 0 | 0 | A Negative |
| 0 | 4+ | 4+ | 3+ | 0 | 0 | 0 | 0 | B Negative |
| 4+ | 4+ | 4+ | 0 | 0 | 0 | 0 | 0 | AB Negative |
| 0 | 0 | 0 | 3+ | 3+ | 0 | 0 | 0 | O Negative |

4+/3+

Grading of
Agglutination

0

No Agglutination
presence