

Compatibility Testing (pre-transfusion testing)-

Introduction -

- Compatibility testing ensure safe blood transfusion.
- Prevent hemolytic transfusion reaction.
- Confirms donor RBC compatibility with recipient serum.

The term compatibility testing means pre-transfusion testing .

Step in pre-transfusion testing-

1. Received Blood requisition form with sample.
2. Identification of recipient blood sample.
3. Testing recipient sample(visual examination ,ABO & Rh grouping ,Screening for Irregular antibody, Rh phenotyping, Comparison with record.
4. Selection tested blood components.
5. Compatibility testing (Cross matching).
6. Proper labeling and issue.

Received Blood requisition form with sample-

Blood requisition form-

A written request form with the information of recipient, components required, quantity required, patient diagnosis, transfusion History, indication for transfusion and sign of physician with stamp.

Recipient blood sample-

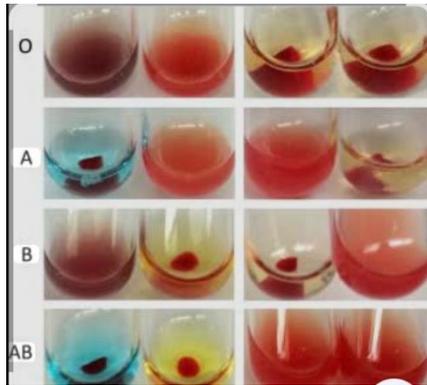
EDTA & CLOT recipient sample Vials required for pre-transfusion testing.

Identification of recipient blood sample-

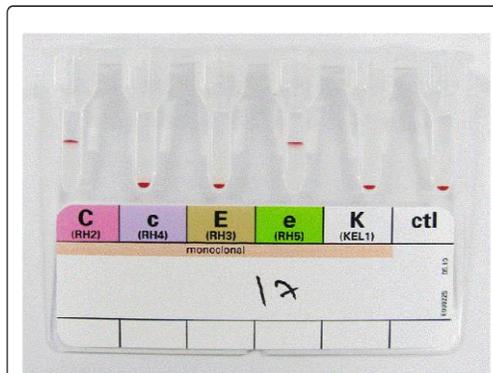
Match recipient EDTA & CLOT sample with requisition form properly(Name, Age , sex, registration no.)

Testing recipient sample-

- A. Visual examination -** Check EDTA & CLOT sample label, volume (2 cc in EDTA & 3 cc in CLOT vial) , centrifuge both vials and check hemolysis.
- B. Determination of ABO type-** Both cell grouping(Forward grouping) & serum grouping (Reverse grouping) should be done as per standard protocol of blood grouping. Forward grouping & Reverse grouping should be matched. If any discrepancy between Forward grouping & reverse grouping blood should not released until discrepancy resolved.



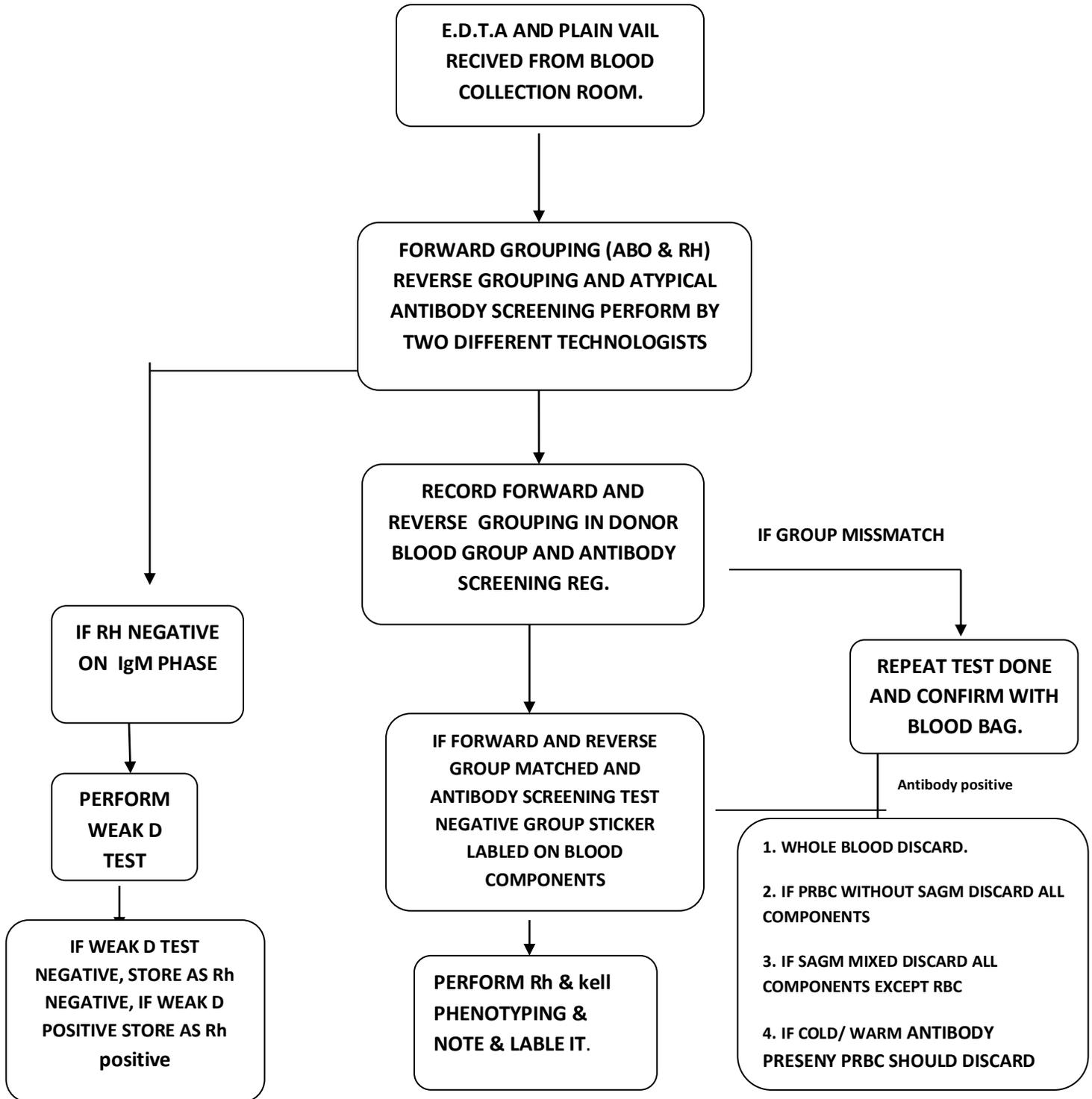
- C. Determination of Rh (D) type-** Determination Rh D antigen should be done as per standard protocol. Weak D testing is not required for recipient sample .
- D. Antibody screening & identification-** The recipient's serum should be tested for unexpected antibodies by Indirect antiglobulin test with proper control (positive, negative and endpoint using check cell). The screening should ideally be done using done by cell panel. If antibody detected in screening the antibody should be identify by cell panel.
- E. Determination of Rh & kell phenotyping-** Determine recipient's phenotyping by gel card or reagent(C,c, E,e, kell) .



- F. Checking recipient's record** If patient has history of blood transfusion record must be checked –
- ABO & Rh typing
 - Unexpected antibody/antibodies
 - Any problem in cross matching
 - Any transfusion reaction.
- If any discrepancy found current & past blood group ,a fresh sample should be requested and tested to confirm correct blood group.

Selection of blood components - When recipient test done a suitable unit needs to be selected for cross matching as per the requirement of the components. Checked **ABO & Rh, Rh & kell phenotyping, TTI status, expiry date, haemolysis, colour change, clot or any leakage**. After selection of donor unit rechecked ABO & Rh grouping and cross match with recipient sample. Tube segment attached with patient sample for repeat testing.

When prepare donor unit which test(Serological) needed



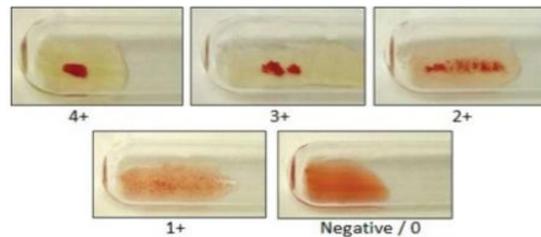
Compatibility testing (Cross matching)- The crossmatch test carried out to ensure that there are no antibodies present in patient's serum that react with donor cell when transfusion occur.

Crossmatch testing procedure divided two part –

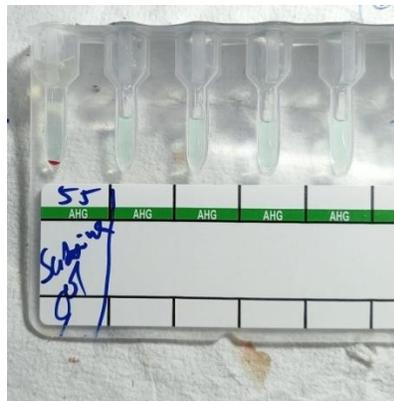
- Major crossmatch(Donor cell with patient's serum)
- Minor crossmatch (Donor plasma with patient's cell)

Crossmatch may be done at different phases depending on temperature and the use of AHG testing.

a) Immediate spin crossmatch- It call serological crossmatch. An immediate spin technique occur in room temperature to detect ABO incompatibilities between donor cell & recipient serum.



b) Antiglobulin crossmatch- It performs 37°C to detect incomplete or IgG type antibodies in recipient serum against the antigen on donor cell. It will perform by tube method or CAT (Column agglutination test) technique. In this technique use AHG reagent for detected cell which already sensitized by IgG antibody.



c) Electronic crossmatch- An electronic crossmatch uses logic table located in laboratory information system (LIS) to detect ABO incompatibilities between patient & donor. The recipient serum is not physically tested with donor cell . The electronic crossmatch also called computer assigned crossmatch.

When we perform DCT- Direct coomb's Test used to detect in-vivo sensitization of red cell (detect the antibody who already attached or sensitized on red cell).

- Autoimmune anemia(AIHA)
- Hemolytic disease of fetus or newborn(HDFN)
- Drug-included immune hemolytic anemia
- Hemolytic transfusion reaction

Final conclusion of pre-transfusion testing-

- Match recipient & donor ABO & Rh
- Screening recipient & donor irregular antibodies(identification antibodies by cell panel if possible).
- Rh & kell phenotype match between recipient & donor(or matched or recipient have those antigen but donor not)
- Crossmatch between recipient & donor sample (donor cell & recipient serum)

Labelling & Prepare crossmatch or compatibility test report & issue- Blood unit found to be crossmatch compatible with patient should be labeled issue sticker (A- yellow,B-pink,O-blue,AB-white)

Prepare a crossmatch report. Crossmatch report should have patient name, age, sex, Hospital information, Patient registration no, ward, bed no, ABO & Rh(D) type, Unit no of donor, expiry date & collection date of product, segment no, Interpretation of crossmatch report, Name of person who performing test.

Crossmatch report & dono unit with label issue the recipient or patient party or hospital staff.

PAITENT ISSUE FLOW CHART

