HEALTH HOLDING

HAFER ALBATIN HEALTH CLUSTER MATERNITY AND CHILDREN HOSPITAL

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| **Department:** | Laboratory and Blood Bank | | |
| **Document:** | Internal Policy and Procedure | | |
| **Title:** | Pre-Transfusion and Compatibility Testing | | |
| **Applies To:** | All Blood Bank Staff | | |
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## 1. PURPOSE:

1.1 Pre-transfusion and computability testing of blood recipient ensure increased patient's safety and reduced possible transfusion reactions.

## 2. DEFINITONS:

2.1 N/A

## 3. POLICY:

3.1 Pre-transfusion Testing includes many steps starting with request for transfusion and ending with compatibility testing and labelling of the cross-matched units.

3.2 Request for transfusion:

- 3.2.1 Requests for blood and blood components' transfusion must be submitted in written format.
- 3.2.2 Requests must contain sufficient information for accurate recipient identification, to guide testing, product/ component selection, or both.
- 3.2.3 Verbal requests are acceptable in urgent situations but should be documented during issuing of blood.

3.3 Identification of transfusion recipient and blood specimen collection using at least two recipient's identifiers and by two nurses/ phlebotomists.

3.4 Pre-transfusion testing is performed on a specimen collected from the recipient with every admission and within three days of the scheduled transfusion time.

3.5 Pre-transfusion testing ensures blood specimen acceptability. It includes;

- 3.5.1 Determination of the patient's forward ABO group (RBC grouping).
- 3.5.2 Determination of the patient's reverse ABO group (Serum Grouping).
- 3.5.3 Determination of the patient's Rh-D type.
- 3.5.4 Detection and Identification (if applicable) of unexpected antibodies to red cell.
- 3.5.5 In recently transfused patients, DCT may be required.

3.6 Comparison of current and previous test results is done:

- 3.6.1 There must be a consistency between patient's current and historical records (including group/type, antibody screening).
- 3.6.2 Discrepancies must be resolved before performing the compatibility testing.

3.7 When there is no history for the patient in the transfusion services records or computer system, two determinations of the patients ABO/RhD must be made on two specimens collected during the current admission to prevent wrong blood in tube (WBIT).

3.8 For ABO / Rh (D) grouping:

- 3.8.1 If a discrepancy is detected in ABO grouping and transfusion is necessary before resolution, only group O Red Blood Cells is issued.
- 3.8.2 The test for weak D is unnecessary.

3.9 Donor RBC unit testing is performed for ABO/ Rh (D) group confirmation, from an integrally attached segment, must be done..

3.10 Donor red cell unit selection: Blood bank technicians/ specialists are trained how to deal and select

blood in the different situations. Refer to "selection of blood/blood product for transfusion" policy

3.10.1 The blood bank technicians/ specialists must follow the guidelines and policies of selection of compatible blood and components in special circumstances like blood administered in urgent situations, massive transfusion, neonates, transfusion when no units are compatible ....etc.

3.11 Compatibility testing (serologic crossmatch).

3.11.1 The compatibility testing ensures the detection of any incompatibility (including ABO incompatibility) between the recipient's serum/plasma and the donor's RBC.

3.11.2 The compatibility testing is performed on integrally attached segment from the donor's RBC unit.

3.11.3 The process includes checking for presence, now or in the past, of clinically significant antibody in the patient's serum.

3.11.4 Immediate spin crossmatch is acceptable for patient with no clinically significant antibodies.

3.12 Labelling of the cross-matched units.

3.12.1 The cross-matched units are properly labelled with with patient's name, patient's identification number and patient's ABO /Rh-D.

3.13 The patient's physician must be urgently notified in some situations.

3.14 Every physician must follow his/ her case with the blood bank regarding the availability of the requested component.

## 4. PROCEDURE:

4.1 **Request For Transfusion** (see policy of 'ordering of blood/blood products and tests).

4.2 **Identification of Transfusion Recipient and Blood Specimen Collection** using at least two recipient's identifiers and done by two nurses/ phlebotomists. (see policy of 'ordering of blood/blood products and tests').

4.3 **Testing Of Transfusion Recipient's Blood Specimen:**

4.3.1 Blood specimen acceptability (see policy of 'ordering of blood/blood products and tests).

4.3.2 Patient's history:

4.3.2.1 Search for the patient's history of ABO/Rh (D), Difficulty in blood typing, clinically significant antibodies, date of previous transfusion, significant adverse events to transfusion, and special transfusion requirements.

4.3.2.2 There must be a consistency between the patient's current and historical records including group/type, antibody screening).

4.3.2.3 Discrepancies must be resolved before performing the compatibility testing.

4.3.2.4 The comparison should be documented.

4.3.2.5 When there is no history for the patient blood group in the patient's records or computer system, two determinations of the patient's ABO/RhD must be made on two specimens collected during the current admission to prevent wrong blood in tube (WBIT).

4.3.2.6 The attending physician must ask a second, independently drawn specimen on patients with no historical ABO group and Rh type available (except in emergency cases).

4.3.3 ABO group (Refer to "ABO BLOOD GROUPING AND RH TYPING" policy (LB-IPP-196)): this includes;

4.3.3.1 Determination of the patient's forward ABO group (RBC grouping).

4.3.3.2 Determination of the patient's reverse ABO group (Serum Grouping).

4.3.3.3 If a discrepancy is detected in ABO grouping and transfusion is necessary before resolution, only group O Red Blood Cells is issued.

4.3.4 Determination of the patient's Rh-D type (Refer to "ABO BLOOD GROUPING AND RH TYPING" policy (LB-IPP-196)):

4.3.4.1 The test for weak D is unnecessary when testing the patient.

4.3.4.2 If problems in D typing arise, especially if the patient is a female of childbearing potential, it is prudent to limit transfusion of red-cell-containing blood components to those that are D-negative, at least until the problem is resolved.

4.3.4.3 In the presence of discrepancy between current and previous ABO & Rh (D) results, ask for another sample of the patient and resolve the discrepancy.

4.3.5 Detection of unexpected antibodies to red cell antigens (Refer to "ANTIBODY SCREENING, IDENTIFICATION, AND TITRATION" policy (LB-IPP-199)).

4.3.5.1 May be performed in advance of, or together with, a crossmatch between the patient's serum or plasma and the donor red cells.

4.3.5.2 Performing antibody detection tests before crossmatching permits early recognition and identification of clinically significant antibodies and thereby permits selection of the appropriate crossmatch procedure and RBC units.

4.3.5.3 The reagent red cells used are not pooled.

4.3.6 Antibody identification (if applicable): (Refer to "ANTIBODY SCREENING, IDENTIFICATION, AND TITRATION" policy (LB-IPP-199)).

4.3.6.1 It is done when antibody detection testing is positive or in patients with previously identified clinically significant antibodies to identify additional clinically significant antibodies.

4.3.6.2 After a clinically significant antibody has been identified, antigen-negative RBC units must be selected for all future transfusions, even if the antibodies are no longer detectable. Full cross match must be done with these bags.

4.3.6.2.1 If the extended blood grouping (phenotyping) of the bags is not available, try to find a compatible bag by performing cross matching of many units.

4.3.6.3 The blood bank should maintain records of all patients in whom clinically significant antibodies have been previously identified.

4.4 **Donor RBC Unit Testing:**

4.4.1 ABO/ Rh (D) group confirmation from an integrally attached segment must be done before releasing the unit to the refrigerator for screened units.

4.4.2 With cross match, repeated bag's ABO/ Rh (D) group is done (may be done by slide method). Confirmatory testing for weak D is not repeated.

4.4.3 Discrepancies must be resolved before issue of the blood for transfusion purposes.

4.5 **Donor Red Cell Unit Selection:** Refer to "selection of blood/blood product for transfusion" policy.

4.6 **Compatibility Testing (Serologic Crossmatch):** Refer to "cross matching techniques" and "column technology and the gel microtyping system" policys (LB-IPP-205 & 206).

4.6.1 The crossmatch is an in vitro procedure to determine serologic compatibility between donors' red cell suspension and recipients' serum/plasma without agglutination and or hemolysis in the various phases.

4.6.2 In MCH blood bank, "column technology using the gel microtyping system" is nearly the sole technique used for computability testing.

4.6.3 The process ensures the detection of any incompatibility (including ABO incompatibility) between the recipient's serum/plasma and the donor's RBC.

4.6.4 The compatibility testing is performed on integrally attached segment from the donor's RBC unit.

4.6.5 The process includes checking for presence, now or in the past, of clinically significant antibody in the patient's serum.

4.6.6 Immediate spin crossmatch is acceptable for patient with no clinically significant antibodies (not detected in current antibody detection tests and there is no record of previous detection of such antibodies) or upon request by doctors in emergency situations.

4.6.7 Procedure (In brief):

4.6.7.1 Allow all reagents to reach room temperature before use .

4.6.7.2 Identify the appropriate microtubes of the ID-Card 'LISS/Coombs" with the patient's and donor's name or number.

4.6.7.3 Remove the aluminum foil from as many microtubes as required by holding the ID card in the upright position.

4.6.7.4 Prepare a 0.8 - 1 % suspension of red cells as follows:

4.6.7.4.1 10 ul red cell concentrate + 1.0 ml ID-Diluent 2 or;

4.6.7.4.2 20 ul whole blood of blood bag segment + 1.0 ml ID-Diluent 2 and mix well.

4.6.7.5 Pipette 50 uL of the donor red cell suspensions to the appropriate microtubes.

4.6.7.6 For the autocontrol, Pipette 50 uL of the patient's own red cell 0.8 - 1 % suspension to the appropriate microtube.

4.6.7.7 Add 25 uL of the patient's plasma or serum to each microtubes.

4.6.7.8 Incubate the ID-Card for 15 minutes at 37 °C in the ID-Incubator.

4.6.7.9 Centrifuge the ID-Card for 10 minutes in the ID-Centrifuge.

4.6.7.10 Read and record the results.

4.6.8 Interpretation:

4.6.8.1 A negative reaction indicates compatibility of the donor blood with the recipient.

4.6.8.2 A positive reaction (± to 4+) indicates incompatibility of the donor blood with the recipient, due to presence of antibodies directed against antigens on the donor red cells. Further investigation to identify the antibody specificity should be performed.

4.6.8.3 Positive reactions in the "Auto" control indicates a false positive and or a autoreacting antibody and must be further investigated.

4.7 **Reporting Results:**

4.7.1 Enter the unit types, numbers, volume, record reaction results, antibody screening, expired date of the unit and blood group in the blood transfusion requests and crossmatching register.

4.7.2 Labeling of blood or blood components with the recipient's Identification: A blood container shall have an attached label or tag indicating:

4.7.2.1 The intended recipient's two independent identifiers; patient name and ID number and patient's ABO/ Rh D.

4.7.2.2 Donation identification number or pool number.

4.7.2.3 Interpretation of compatibility tests.

4.7.3 Place the labeled unit in the refrigerator for crossmatched units.

4.7.4 Blood bank technician/ specialist keeps requests of cross matched units, requests for blood issued, requests without cross match, cancelled cross match forms and OT schedule paper in their specified files.

4.8 **Procedure Notes:**

4.8.1 Do not use an immediate spin crossmatch for neonates (less than 4 months of age) or for patients who have positive immediate spin crossmatch due to cold agglutinins or clinically insignificant antibodies.

4.8.2 When crossmatch-compatible units cannot be found, the treating physician should be involved in the decision about how to manage the patient.

4.8.3 Cross match specimen may be the first and only opportunity that a laboratory has to determine a patient's ABO and Rh status. The risk of WBIT is about 1 in 2000 specimens.

4.8.4 Collection of a type-and-screen specimen days in advance of transfusion, with a second specimen being collected (by another nurse) for blood grouping is one approach to mitigate the problem.

4.8.5 If serum/ plasma is not sufficient for crossmatch, do blood groups check on units until you get new sample.

4.8.6 Compatible crossmatch will not:

4.8.6.1 Guarantee normal survival of transfused cells.

4.8.6.2 Prevent immunization of the recipient.

4.8.6.3 Detect all unexpected antibodies in recipient serum.

4.8.7 Since all donors are routinely screened for irregular antibodies, minor cross match is no longer routinely performed with plasma or platelet transfusion.

4.9 **Cancellation:**

4.9.1 If antibody screen of the patient is negative with no history of significant antibody, any x-matched blood not used after 24 hours should be regarded as cancelled.

4.9.2 If antibody screen of the patient is positive, any x-matched blood not used after 48 hours from sample withdrawal should be regarded as cancelled unless the blood bank is contacted to

re-crossmatch the blood.

4.9.3 In emergency situations, already x-matched blood can be re-cross matched for another patient in greater need. BB technician will inform the ward about cancellation.

## 5. MATERIALS AND EQUIPMENT:

5.1 **Forms and Records:**

5.1.1 Blood & Blood Products Request & Release Form

5.1.2 Clinically significant Antibody file.

## 6. RESPONSIBILITIES:

6.1 Blood bank staff members like technician/ specialist have to follow the detailed procedures.

## 7. APPENDICES:

7.1 N/A

## 8. REFERENCES:


8.1 The Unified Practical Procedure Manual For Blood Banks In The Arab Countries, 1434-2013.

8.2 The Standard Policy For Blood Banks In The Kingdom Of Saudi Arabia, 1st edition, 1435-2014.

8.3 National Standards For Clinical laboratories and Blood Banks, 1st edition, 2015.

8.4 AABB Technical manual, 18th edition, 2014.

8.5 AABB Standards for Blood Banks and Transfusion Services, 30th edition, 2016.

8.6 Mollison's Blood Transfusion in Clinical Medicine; 12th edition, 2014.


## 9. APPROVALS:

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