

Pre-transfusion testing

What is Pretransfusion Testing?

Pre-transfusion testing involves :

- ✓ Determining the patient's ABO & Rh(D) Group
- ✓ and screening patient's sera for red cell alloantibodies -- Antibody Screen; then
- ✓ Performing a major cross-match (testing the patient's serum against donor's red cells) to detect any incompatibility.

The purpose of Pre-transfusion Testing

Pre-transfusion testing ensures ABO compatibility between the donor and the recipient and should detect most clinical significant red cell alloantibodies that will react with donor's red cells.

Current Standard of Pre-transfusion Testing

Clerical Checking

All samples received at the blood bank are checked to make sure that the information on the sample labels and the request form are identical. The patient's transfusion history is also checked.

Blood Group Typing

ABO grouping is determined by testing red cells with anti-A and anti-B and testing the serum with A cells and B cells. Rhesus (D) type is determined by testing with anti-D.

Antibody Screening

Patient's serum or plasma is tested against a panel of reagent red cells.

If the antibody-screening test is positive, further serological testing is required to identify the antibody(s). Once the specificity of the antibody(s) has been identified the donor units must be screened for corresponding antigen to select the antigen negative units.

Type and Screen

It is **NOT** necessary to cross-match blood in advance for patients undergoing surgical procedures that usually do not require blood transfusion. In those circumstances the patient's blood is tested for ABO and Rhesus grouping, screened for the presence of red cell alloantibodies and, if there is no alloantibody, the patient's blood is stored in the blood bank for eventual rapid cross matching (immediate spin) if it is deemed necessary to transfuse the patient during the procedure for which the tests were requested.

Cross-matching

If the screen is positive for red cell alloantibodies and the specificity of the antibody(s) identified or the patient has a positive history of clinically significant antibodies a more comprehensive cross-match using an indirect antiglobulin test is performed with antigen negative blood units.



Advantage of Type and Screen

The type and screen offers several advantages over the older practice of crossmatching and reserving specific donor units for patients:

- Better use of donor blood, as it is not tied up by being crossmatched and held for patients who probably will not need it.
- More efficient service for patients, as blood bank personnel are not tied up crossmatching needlessly or removing tags from unused products but rather are available for more useful purposes.
- Potential for a more economic transfusion service due to decreased blood inventory requirements, decreased reagents, and more efficient use of technologist time.

SAMPLE VALIDITY

- Pretransfusion testing and transfusion of a patient who is **pregnant** or who has been pregnant or **transfused** in the past three months **shall** be completed within 72 hours of the sample being collected, unless an extension of this period is approved by the officer-in-charge of the laboratory.
- Compatibility testing may be performed on a sample collected in advance of elective surgery. This is permitted provided that the sample has been tested and stored in the laboratory at -20°C for up to 1 month. The above requirements shall apply and be validated and documented by the requestor.
- Once a transfusion is commenced, units not transfused within 72 hours **shall** be subjected to pretransfusion testing on a new sample from the patient.

PRE TRANSFUSION TESTING IN THE NEWBORN (DURING FIRST FOUR MONTHS OF LIFE)

- **Neonatal Blood Sample** (Usually Cord Blood) : Tested to determine Neonate's ABO and Rh(D) group. (In determining the ABO group only the red cell group need be performed.)
- **Maternal Blood Sample:** Test antibody screen on maternal serum/plasma collected at delivery or at the time of neonatal admission should be performed where possible to detect clinically significant antibodies.
- If the initial antibody screen is negative, it is unnecessary to crossmatch donor red cells for the initial or subsequent transfusions. Repeat testing may be omitted for the remainder of any one hospital admission in the first four months of life.
- If clinically significant antibodies are identified, donor units for transfusion that do not express the corresponding antigen, should be selected. Such units should be crossmatched using either maternal or neonatal serum/plasma.

Reference:

- EYD Chow. The impact of the type and screen test policy on hospital transfusion practice. HKMJ Vol 5 No 3 September 1999
- Nancy J. Nordenson, The Gale Group Inc., Gale, Detroit, [Gale Encyclopedia of Medicine](#), 2002

