1. **Principle**

A computer crossmatch is used to assign blood/components to a patient. The computer system must have been validated by the user and shown to be capable of preventing the release of ABO incompatible blood/components to the patient and will alert the user of any discrepancies between patient and donor group.

1. **Scope and Related Policies**
   1. A compatibility test shall be performed before red cells are transfused, except in life-threatening situations.9.1
   2. When there is insufficient time to complete the ABO and Rh group of the recipient, group O red cells shall be issued. Females of child bearing potential and children must be issued Group O Rh negative red cells.9.1
   3. If red cell units are issued before compatibility testing is complete, the issue voucher shall indicate that testing is incomplete. Should the red cells units subsequently prove incompatible, the attending physician and the Transfusion Service Medical Chief or designate shall be informed. Infusion of incompatible units must be stopped immediately and the units set aside pending the physicians’ decision.9.1
   4. If no clinically significant antibodies were detected in the antibody screen test and there is no record of previous detection of such antibodies, at a minimum detection of ABO compatibility shall be performed.9.1
      1. For patients who have been transfused or pregnant within the last three months, or if history of transfusion or pregnancy is uncertain or unknown, specimens for testing prior to computer crossmatch shall be no more than 96 hours old.9.1
      2. For patients who have not been transfused or pregnant in the past three months, plasma for testing prior to computer crossmatch may be stored and used at any time during the current hospital admission or as specified in facility policy. The current admission period is the time from admission to discharge, but also includes up to a one month period from the time of pre-admission testing up to the current admission.
   5. Computer compatibility matching shall include:9.1
      1. Determination of the recipient’s ABO and Rh type on current sample (CUR ABO). See RT.001 – ABO Grouping.
      2. An ABO confirmation (PREV ABO) must be done by either a second testing (preferably by a 2nd technologist) on the current sample or by comparison of previous ABO results. See Procedural Notes 8.2.
      3. The current sample antibody screen (CUR ABSC) must be negative and there must be no known history of clinically significant red cell antibodies (KNOWN AB). See Procedural Notes 8.1 and RT.005 – Antibody Screen.
      4. Computer confirmation of ABO compatibility between donor and recipient
   6. ABO group of red cells collected and prepared by the blood supplier must be confirmed. See Procedural Notes 8.4.
   7. An issue voucher and/or compatibility label shall be completed for all red cells issued. This must identify:

* Recipient’s family and given name(s)
* Recipient’s identification number(s)
* ABO and Rh group of the recipient
* ABO and Rh group of the donor red cell(s)
* Donor unit number (including check digit and source code)
* Name of the component
* Compatibility status of the red cell(s)
* Date and time of issue
  1. The recipient’s blood specimen must be stored at 1-6° C for at least 7 days after the unit is transfused.9.1
  2. An identifiable segment of all donor red cell units transfused must be kept and stored at 1-6° C for at least 7 days after the unit is transfused.9.1

1. **Specimens**

EDTA anticoagulated whole blood

1. **Materials**

**Equipment:** Validated computer system

**Supplies:** Donor unit(s)

Compatibility labels

See CSP.001 – Selection of Blood Components for Transfusion and Procedural Notes 8.5.

1. **Quality Control – N/A**
2. **Procedure**
   1. Check the patient history and the result of a current antibody screen. See PA.003 – Patient History Check.
      1. If the patient has an antibody(ies) or history of clinically significant antibody(ies), do not perform a computer crossmatch. See RT.011 – Antiglobulin Crossmatch – Saline, LISS, PEG.
      2. If the patient has no history of clinically significant antibodies and the current antibody screen test is negative, order the computer crossmatch procedure in the LIS system (LIS - Laboratory Information System).
   2. Select the appropriate donor units. See CSP.001 – Selection of Blood Components for Transfusion. Select units that will be in date on the date of surgery or intended transfusion. See Procedural Notes 8.5.
   3. Remove selected units from the refrigerator and visually inspect each donor unit. See IM.003 – Visual Inspection of Blood, Blood Components and Fractionated Blood Products.
   4. Arrange the donor units in order of date, the oldest one in the front.
   5. Scan selected ABO compatible units into computer crossmatch procedure.
   6. Result the computer crossmatch procedure for each donor unit. Result fields include PREV ABO, CUR ABO, CUR ABSC, KNOWN AB and the crossmatch interpretation.
   7. The computer will interpret the crossmatch. The only possible interpretation is compatible (CP).
   8. Perform and verify the crossmatch procedure.
   9. Generate a compatibility label for each compatible unit containing at least the following information:

* Patient family and given name(s)
* Patient identification number
* Patient ABO and Rh group
* Name of the component, e.g., RBC, leukocyte reduced (optional)
* Donor unit ABO and Rh group
* Donor unit number (including check digit and source code)
* Compatibility status of the unit
* Date and time of issue
  + 1. For each donor unit, compare the unit number printed on the blood bag with the unit number recorded on the compatibility label. They must be identical.
    2. Attach a compatibility label securely to the appropriate compatible donor units.
    3. Check that each donor unit:
* Is suitable for transfusion by performing a visual inspection. See IM.003 – Visual Inspection of Blood, Blood Components and Fractionated Blood Products
* Will be in date for the date of transfusion
* Is the same ABO and Rh as the patient. If a donor unit with a different ABO and/or Rh has been selected, write an explanatory note at the bottom of the request form or compatibility label, e.g., “This unit is acceptable for transfusion.”
  + 1. Compare the names and identification number(s) on the compatibility label and on the request form (or computer screen) to ensure they are identical.
  1. Place the donor units in the area where crossmatched blood is stored in the refrigerator. Place the units in chronological order with the oldest unit in the front.
  2. Perform a clerical check. For each patient, check that:
* The name and identification number(s) are identical on all specimens and on the request form
* All test results have been recorded
* The test results have been reported and interpreted correctly.
  1. Initial or sign and record the completion time and date on the request form or in the computer.

1. **Reporting**
   1. A computer crossmatch is interpreted as compatible when all criteria is met in the result entry fields.
2. **Procedural Notes**
   1. The computer crossmatch shall be used for patients presenting with a negative antibody screen and no known history of clinically significant red cell antibodies.9.1
   2. The patient’s ABO group shall be determined twice. This shall include ABO determination on the current sample plus one of the following:9.1

* a second independent testing on the current sample
* comparison of results of previous ABO testing which are on file
* testing of a second correctly identified and labeled specimen
  1. The computer crossmatch system shall alert the user to discrepancies between the current blood group result(s) and/or the results of previous blood group records.9.1
  2. When using a computer crossmatch, the ABO group of donor red cells must be serologically confirmed on receipt by the TM Lab. ABO interpretation must agree with the blood bag label and discrepancies must be investigated, resolved and documented. 9.1

Discrepancies identified must be reported to the blood supplier.

* 1. The computer crossmatch system shall have a data base of the donor unit number, type of component, expiry date and ABO and Rh type (including interpretation of ABO confirmatory test). The information must be verified prior to release of the blood component. 9.1

1. **References**
   1. Standards for Hospital Transfusion Services Version 2 – September 2007. Canadian Society for Transfusion Medicine, 5.3.7.1, 5.3.7.4.5, 5.3.7.4.2, 5.3.7.4.3, 5.3.7.2.1, 5.2.3.3, 5.3.7.3, 5.7.21, 5.2.3.5, 5.3.1.6.
   2. Roback JD, ed. American Association of Blood Banks Technical Manual, 16th ed. Bethesda, MD: American Association of Blood Banks, 2008: 454.