



## **ABO and Rh(D) Testing and Blood Group Resolution at Canadian Blood Services**

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### Discrepancy Reporting

If a donor unit at a hospital shows weak or variable ABO Rh(D) reactivity on retesting, but is ultimately confirmed as the group on the end label, submitting a hospital customer feedback form to Canadian Blood Services is not required. The list below is a partial explanation of investigations which the donor testing lab and National Immunohematology Reference Laboratory (NIRL) may undertake to confirm an ABO Rh(D) type on a donor. If an ABO or Rh(D) discrepancy cannot be resolved and the group confirmed, the donor unit is discarded at CBS. If the donor ABO Rh(D) cannot be confirmed on more than one occasion, the donor may be deferred.

### ABO and Rh(D) Testing

Donors are tested on an automated analyzer (PK7300®, Beckman-Coulter Inc.) for ABO and Rh(D) at every donation.

First time donors who have a valid ABO and are Rh(D) negative are tested for weak D test on a second automated analyzer, the NEO® (Immucor®). If determined to have weak D reactivity, and a negative DAT, the donor is considered Rh(D) positive.

### ABO and Rh(S) Blood Group Resolution

If the ABO Rh(D) result from the PK 7300® are weaker than expected (as per instrument configured criteria resulting in a No Type Determined (NTD) interpretation then the ABO Rh testing is done on the NEO. If the testing is weaker than expected on the NEO® and result is NTD, manual tube ABO/Rh(D) resolution testing is done. The NEO® looks for a minimum 2+ reaction for a positive result.

Manual testing may include one or more of the following techniques depending on the discrepancy identified on initial testing. For subsequent donations with the same results, we may refer to the prior investigation and direct our testing accordingly. Donors for whom a valid ABO Rh(D) type cannot be confirmed will be deferred.

For Rh(D) typing:

- 37 degree incubation of anti-D with donor red blood cells.
- IAT testing of anti-D with donor red blood cells.

For ABO reverse grouping discrepancies:

- Assessment for anti-A<sub>1</sub> by reactions with A<sub>1</sub> and A<sub>2</sub> reagent red blood cells.



- Assessment using a second source of reverse grouping A<sub>1</sub> and A<sub>2</sub> red blood reagent cells.
- Assessment of screen cell reactivity.
- Increase serum:cell ratio (including auto control + screening cells).
- Incubation of reverse reactions (including auto control + screening cells) at 2-8° C.
- Investigation for cold reactive antibodies by testing with antibody panels.
- Phenotyping of reverse red blood cells for relevant antigen.
- Retesting with antigen negative reverse red blood cells.

For ABO forward grouping:

- Assessment for mixed field (for possible A<sub>3</sub> or B<sub>3</sub> subgroups).
- Assessment with anti-A,B reagent.
- Testing cells with anti-A<sub>1</sub> Lectin.
- Incubation of the forward grouping tubes for the maximum allowable time as per package insert.
- Testing for A and B antigen by adsorption/elution of polyclonal anti-A or anti-B (performed at (NIRL)).

For Rh(D) discrepancy or resolution of weak reactivity:

- For weak reactions with initial anti-D, up to 3 different anti-D reagents are used along with indirect antiglobulin test (IAT) assessment.
- RHD genotyping, sequencing and Advanced Partial Rh(D) serological typing panel may be used for investigation (NIRL).