Guidelines for the Blood Transfusion Services

12.11: Additional testing

http://www.transfusionguidelines.org/red-book/chapter-12-donation-testing-red-cell-immunohaematology/12-11-additional-testing

12.11: Additional testing

12.11.1: Antibody identification

- Donations found to be reactive in the routine antibody screen may be further investigated for specificity.

12.11.2: Blood and blood components from group O donors with high titres of anti-A, anti-B and/or anti-A,B

- Red cells, platelets and fresh frozen plasma from group O donors with high titres of anti-A, anti-B and /or anti-A,B can result in haemolytic transfusion reactions (HTRs) when given to non-group O patients. Such group O donors are generally termed ‘high-titre group O donors’.
- Reactions are more likely to occur when:
    - the serological titre of the anti-A, anti-B and/or anti-A,B in the component is high
    - the plasma volume of the transfused product is high
    - the blood volume of the recipient is small.
- Each Blood Establishment should have a testing and issuing policy to avoid the use of high-titre anti-A and/or anti-B in instances where a significant adverse clinical reaction is likely. The policy should cover the following components:
    - whole blood and plasma reduced red cells (excluding red cells in additive solution)
    - fresh frozen plasma
    - apheresis platelet donations
    - pooled platelets containing plasma from a single ‘high-titre’ group O donor
    - blood/components for neonatal use, and infants under one year.
- Where high-titre anti-A/B testing is deemed necessary, a saline agglutination test (performed as detailed in Chapter 11) should give a negative result, at a dilution of 1/128, or an equivalent dilution by other techniques.
- There should be a procedure in place to collect and review testing and patient outcome data and to implement changes in policy in the light of continuing clinical experience with the plasma-containing blood products issued.
- Components from group O donors with ‘low titres’ of anti-A, anti-B and/or anti-A,B can cause intravascular haemolysis in non-group O recipients if given in sufficiently large volumes.
- It is important to recognise that, although testing for high-titre ABO antibodies in blood donors may reduce the risk of HTR in ‘out of group transfusion’, it cannot be entirely eliminated through this route. Group O platelets can cause HTR even when tested and labelled negative for high-titre haemolysins. They should only be used for non-group O patients (particularly paediatric patients) as a last resort.

12.11.3: Additional phenotyping

- Red cell components should only be labelled with confirmed extended phenotypes.
- A confirmed phenotype is one where the typing has been carried out and results concur:
  - in duplicate on the current donation, or
  - once on the current donation and the result is in agreement with historical data from previous donations, or
  - on two previous donations from that donor.

For labelling to be carried out under the last of these conditions, the security of the donor data, testing methodology used on each occasion and that of the historical test result data, must be assured through validation and risk assessment.

12.11.4: Quality control of additional phenotyping

- Quality control of procedures recommended by reagent and equipment manufacturers should be followed.
- The test monitors shown in Table 12.2 are required for each batch of tests.
- Within some test procedures reagent cross-contamination may occur. Test monitors should be selected in order to maximise the detection of such contamination.

Table 12.2 Test monitor red cell samples

Blood grouping reagent	Test monitor red cell samples	
	Positive	Negative
anti-C	R_1r	R_2r or rr
anti-E	R_2r or r''r	R_1r or rr
anti-c	R_1r or r'r	R_1R_1
anti-e	R_2r or r''r	R_2R_2
anti-K	K+k+	K–k+
Other specificities	Heterozygous positive	Antigen negative

12.11.5: HbS screening

Unless the Blood Centre recommends that screening of donations for HbS is unnecessary, each Blood Establishment should have a protocol in place which:

- Ensures the use of donations which are HbS screen negative for the manufacture of whole blood and red cell components for intrauterine transfusion, neonatal exchange transfusion and for the transfusion of children and adults with haemoglobinopathy. This protocol may be extended to further red cell products as deemed necessary by the Blood Establishment.

Note: Where the Laboratory Information Management System (LIMS) in use allows recording of the donor's HbS status, historical information may be used for the purposes described above, provided that the security of the donor data, testing methodology and that of the historical test result data, has been assured through validation and risk assessment.

- Ensures confirmatory testing for donors who are found to be HbS screen test positive.