**Model SOP**

**Standard Operating Procedure**

**Name of the facility / activity : Detection of incompatibility between patient and donor (Cross matching)**

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| **SOP no.** | **Effective Date** | **Pages** | **Prepared by** | **Authorised by** |
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| **LOCATION** : Red Cell Serology Laboratory | | | | |
| **SUBJECT** : Detection of incompatibility between patient and donor | | | | |
| **FUNCTION** : Saline/Enzyme Cross-match. | | | | |
| **DISTRIBUTION**: Supervisor in charge of Red Cell Serology Laboratory  Master File | | | | |

1. **SCOPE & APPLICABILITY:**

This procedure is applied for compatibility testing of all patients requiring transfusion.

1. **RESPONSIBILITY:**

It is the responsibility of the technician in the red cell serology laboratory to perform cross match and document the results. If any unexpected antibody is detected, the advanced Red Cell Serological should be informed.

1. **MATERIAL REQUIRED:**

**Equipment:**

* Refrigerator to store samples & reagents at 2 – 60C.
* Deep Freezer to store enzyme papine – cystein in frozen state.
* Tabletop centrifuge.
* Automated cell washer (for patient pre-transfusion and prenatal testing).
* Microscope.
* Dry bath.

**Specimen:**

Clotted blood sample of donors/patients.

**Reagents:**

* Group O polled cells/Antibody-screening reagent red blood cells (two or three cells).
* Papain –cystein.
* 22% Bovine albumin.
* Antihuman globulin reagent(anti-IgG+anti-C3d)
* IgG – sensitised control cells.
* 0.9% saline.
* Distilled water

**Glassware:**

* Glass test tubes.
* Coombs’ tubes (for patient pre-transfusion & prenatal testing).
* Micro tubes.
* Pasteur pipettes.
* Glass slides.

**Miscellaneous:**

* Rubber teats.
* Disposal box.
* 2 plastic beakers.
* Wooden blocks to hold micro tubes.
* Aluminium racks to hold serum and coombs’ tubes.

1. **PROCEDURE:**

**Principle:** The major cross-match is used to detect unexpected blood group antibodies in patient’s serum against antigens on donor cells. Positive reaction in any test indicates incompatibility.

**Cross-match:**

1. Label 3 tubes with patient/donor test identification.
2. Add 2 drops of patient’s serum to each tube.
3. Prepare 5% cell suspension in 0.9% saline from each donor unit segment.
4. Add 1 drop 5% donor red cell suspension to the tubes containing patient’s serum.
5. Add 1 drop pap-cysteine to tubes labelled enzyme.
6. Add 1 drop of 22% albumin to the tubes labelled albumin.
7. Mix the contents of tubes gently and incubate for minimum 15 minutes. (Saline tubes at room temperature and Enzyme / Album at 370C)
8. Centrifuge the tubes at 1000 rpm for 1 minute.
9. Examine for hemolysis.
10. Gently resuspend red cell button and examine for agglutination.
11. Examine all visually negative reactions under microscope.
12. Grade and record test results immediately.
13. Let a second technician check the results.

**Interpretation:**

* 1. Hemolysis or agglutination in any test indicates incompatibility.
  2. Absence of hemolysis / agglutination in all tests indicates compatibility.

**Limitations:**

Th saline / enzyme cross match will not:

1. Detect error in Rh typing
2. Prevent isoimmunisation of the recipient
3. Ensure normal red blood cell survival
4. Detect some weakly reactive antibodies
5. **DOCUMENTATION:**

* Enter results in cross-match register and compatibility report form.
* All records are initialled by technician who performed the test and the technician who has checked the results.

1. **References:** 
   1. Technical Manual of the American Association of Blood Banks – 15th Edition, 2005.
   2. Introduction to Transfusion Medicine – Zarin Bharucha & D.M. Chouhan, 1st Edition, 1990.
2. **END OF DOCUMENT.**