KAISER PERMANENTE

*Kaiser Permanente Medical Center, San Francisco*
*Northern California Region*
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# Work Instruction

| | | |
|---|---|---|
| **Title:** | **TS-Compatibility Testing** | **WI Number** SFOWI-0089<br>**Revision:** 22 |
| **Department:**<br>Immunohematology<br>**Area:**<br>2425 Geary Blvd SFO Hospital Lab | ***Document is in the Final Approval Process. 2 - approvals are required*** | |
| **Type of Document:**<br>Work Instruction | | **Review Period -** 340 **Days** |

## PURPOSE

Specimen submitted for compatibility (pre-transfusion) testing (including for autologous red cell units) shall be ABORh typed and screened for unexpected red cell antibodies. Crossmatch is the final check for compatibility between donor and recipient to ensure proper selection of blood for transfusion. When the recipient has negative antibody screen and no history of antibodies, the antiglobulin crossmatch is omitted and electronic crossmatch or immediate-spin crossmatch is performed to detect ABO incompatibility.

## REAGENTS

A. 0.9 % saline
B. PeG/LISS
C. Anti-IgG
D. Check cells
E. MTS IgG gel cards

## EQUIPMENT

A. Calibrated centrifuge
B. Test tubes
C. Transfer pipettes
D. LIS for blood bank
E. CIPS computer system
F. Printer
G. ProVue

## SPECIMEN and REQUISITION

Specimens and requisitions must meet the requirements specified in SFOWI-0079 Blood Bank Specimen and Requisition protocol.

## CONTROLS

A. Previous transfusion records (RILIS and CIPS and/or HealthConnect) must be searched

for blood type, antibody, special requirements such as Antigen negative, Irradiated, CMV negative, Hgb S negative blood and comments before compatibility testing.

B. If the patient does not have a historical blood type, a Double Check specimen is needed to confirm the ABO/Rh before blood can be dispensed. Computer/electronic crossmatch can only be performed when there are two ABORh (one must be current & performed locally) in RILIS Millennium.

C. All identifying data on the transfusion requisition must be matched to the specimen label before compatibility testing. Aliases are acceptable if documented in HealthConnect demographics.

D. **If the DBCK sample is not received or tested before blood is needed, O Neg PRBCs shall be serologically crossmatched and dispensed as emergency release.**

E. **If ABORh discrepancy cannot be resolved before blood is needed, O Neg PRBCs shall be selected for crossmatch.**

F. ABO/Rh types of all donor units are confirmed and documented appropriately, using a segment from the unit.

G. Autologous units require crossmatch whether serologic (IS or Extended) or electronic depending on the patient's antibody screen and antibody history.

H. **RESULT OBSERVATION for All Serological Crossmatch Methods**

| If | Then |
|---|---|
| Agglutination or hemolysis (serum) at any phase and any method | Indicates **incompatibility** due to the presence of antibody directed against the corresponding antigen on the donor cells. |
| No agglutination or hemolysis | Indicates compatibility between recipient and donor. |

I. Each unit is visually inspected for acceptability e.g. leakage, discoloration, clots, hemolysis, legible face label, expiration date, before crossmatch.

J. Result is recorded as the test is read and final interpretation is recorded at completion of testing.

**PROCEDURE**

**A. Specimen with current Type & Screen.**

1. Make sure special needs on requisition/order match the computer system. Call the nursing unit to confirm the special needs and enter in the computer system if necessary.
2. Add on crossmatch to the current type and screen accession number.
3. Select packed RBC (Not whole blood) that is ABORh compatible with the patient and which fulfills the special needs, e.g. IRR, CMV -, HgbS -, Ag -.
4. For Surgery patients, crossmatch RBC and place units in a buckets on the top shelf of blood storage refrigerators.

**Compatibility Table for Packed RBCs**

| Recipient Blood Type | O POS | A POS | B POS | AB POS |
|---|---|---|---|---|
| Donor blood type | O POS | A POS | B POS | AB POS |
| | O NEG | A NEG | B NEG | AB NEG |
| | | O POS | O POS | A POS |
| | | O NEG | O NEG | A NEG |
| | | | | B POS |
| | | | | B NEG |
| | | | | O POS |
| | | | | O NEG |

| | | | | |
|---|---|---|---|---|
| **Recipient Blood Type** | **O NEG** | **A NEG** | **B NEG** | **AB NEG** |
| Donor blood type | O NEG | A NEG | B NEG | AB NEG |
| | | O NEG | O NEG | A NEG |
| | | | | B NEG |
| | | | | O NEG |

**Compatibility Table for Whole blood**

| **Recipient Blood Type** | **O POS** | **A POS** | **B POS** | **AB POS** |
|---|---|---|---|---|
| Donor blood type | O POS | A POS | B POS | AB POS |
| | O NEG | A NEG | B NEG | AB NEG |
| | | | | |
| **Recipient Blood Type** | **O NEG** | **A NEG** | **B NEG** | **AB NEG** |
| Donor blood type | O NEG | A NEG | B NEG | AB NEG |

**NOTE: Rh Negative patients shall receive Rh negative Whole Blood or Red Blood Cell components.**

**B. Reading and Interpreting Serologic Compatibility Testing**

1. Read and record results concurrently.
2. Agglutination between donor cells and patient's plasma/serum at any phase is interpreted as incompatible.
3. If hemolysis is observed when using patient's **serum**, the result is interpreted as incompatible.
4. No agglutination between donor cells and patient's plasma/serum is interpreted as compatible.

**C. Negative ABSC and No History of Antibody(s**) - perform computer/electronic crossmatch if the patient qualifies (see table below). Otherwise perform serological immediate spin crossmatch by Tube or Gel (using buffer gel card) methodology . **Note:** Patient must have two blood types before any blood product(s) can be dispensed.

1. **Electronic Crossmatch**
   a. **Note:** CLS **must** qualify patient for Electronic Crossmatch based on the eligibility requirements below. Do Not qualify patient based only on the RILIS Millennium's Eligibility icon.
   b. Refer to Computer SOP for instructions on performing Electronic Crossmatch (EXM).

**Electronic Crossmatch Eligibility Tables**

| **Eligible for Computer Crossmatch** |
|---|
| Current T/S performed at SFO. Two concordant blood types. Negative ABSC (historical and current). |
| Mixed field reaction in forward and/or Rh typing due to out of group blood transfusion. |
| RBC (including Directed and Autologous) without ABORh discrepancy. |
| No Blood Bank comments to disallow Electronic Crossmatch. |
| Transfusion Reaction serological workup is negative. No allo or auto antibody is identified. |

| NOT Eligible for Computer Crossmatch |
|---|
| Only one blood type (No Double Check or No historical upload). |
| Current antibody screen is positive. |
| History of antibody(s) including non-specific antibody. |
| Unresolved ABO Discrepancy. |
| Neonates - see SFOWI-0105 Neonatal Transfusion SOP for details. |
| Whole blood - has not been validated. |
| Granulocytes and bloody platelets- have not been validated. |
| Laboratory Computer System is not available. |

2. **Immediate Spin Crossmatch**

a. **Serological Immediate Spin Crossmatch** (IS) should be performed:

i. When the laboratory computer system is not available.

ii. When crossmatching type specific whole blood (Rh POS patient can receive Rh NEG whole blood). **NOTE: All recipients must receive ABO group specific whole blood.**

iii. When the historical ABORh has not been uploaded to the current computer system.

iv. When AHG crossmatch is perform, IS crossmatch must be performed to detect ABO incompatibility. LISS Ortho Antibody Enhancement solution detects ABO incompatibility, making IS crossmatch unnecessary.

b. **TUBE Immediate Spin Crossmatch Procedure**

| Steps | Action |
|---|---|
| 1 | Add 1 drop of a 2-5% donor cell suspension to 2 drops of patient's plasma in a properly labeled test tube. |
| 2 | Centrifuge at high speed for calibrated time and read immediately and macroscopically. |
| 3 | Results must be entered in the computer as they are read. |
| 4 | If serum is used and hemolysis is observed, the crossmatch must be interpreted as incompatible. |

c. **Buffer GEL Immediate Spin Crossmatch Procedure**

<table>
<tr><th>Steps</th><th>Action</th></tr>
<tr><td>1</td><td>Prepare 0.8% cell suspension from a segment of the donor unit.
<table>
<tr><th>Steps</th><th>Action</th></tr>
<tr><td>a</td><td>Label a 12 x 75 mm test tube for each donor to be tested.</td></tr>
<tr><td>b</td><td>Dispense 1.0 ml of MTS Diluent 2 into the labeled tube(s).</td></tr>
<tr><td>c</td><td>Add 10 ul of the donor packed red blood cells.</td></tr>
<tr><td>d</td><td>Mix gently.</td></tr>
</table>
0.8% final cell suspension are stable for 24 hours.</td></tr>
<tr><td>2</td><td>Buffer Gel Compatibility Test procedure
<table>
<tr><th>Steps</th><th>Actions</th></tr>
<tr><td>a</td><td>Label the MTS Buffer Gel Card with the appropriate identification and test.</td></tr>
<tr><td>b</td><td>Remove foil of the wells that will be used for testing from card.</td></tr>
<tr><td>c</td><td>Add 50uL of 0.8% donor cells into microtube well at $45^{0}$ angle. Do not touch pipette to gel card.</td></tr>
<tr><td></td><td></td></tr>
</table></td></tr>
</table>

| | | |
|---|---|---|
| | d | Add 50uL of patient's plasma at 90° angle into the same well. |
| | e | Centrifuge the gel card at 895±25 RPM for 10 minutes. |
| | f | Read the front and the back of each microtube macroscopically. Record results |
| | g | Cover microtube(s) with tape for review later. |

3 Results

| If | Then |
|---|---|
| Hemolysis (if serum is used) or agglutination of the red cells in a microtube of the gel card | Indicates incompatibility due to the presence of an antibody directed against the corresponding antigen that is present on the donor cells |
| No agglutination or no hemolysis of the red cells and a complete sedimentation of all red cells at the bottom of the microtube. | Indicates negative results and the absence of an antigen/antibody reaction. The unit is compatible. |

d. If the **immediate spin crossmatch is incompatible** (current and historical antibody screen negative), one or more of the following steps should be performed to resolve problem:
   i. Wash donor cells and repeat crossmatch.
   ii. Retype the recipient and donor.
   iii. Perform DAT on the donor cells.
   iv. Saline replacement technique may be helpful to distinguish between rouleaux and agglutination.
   v. If repeat crossmatch is still incompatible, perform an antibody screen and antibody panel at immediate spin and room temperature.

**D. Positive Antibody Screen or History of Antibody(s)**

1. Perform antiglobulin (AHG) crossmatch using one of the following techniques/methods:
   Gel, ProVue, PeG, LISS, Saline or Prewarmed.
2. In general, use the same crossmatch method as the one used to identify the antibody.
3. Also, include crossmatch method to demonstrate ABO incompatibility, either by immediate spin tube test or immediate spin using buffer gel card except when using LISS Ortho Antibody Enhancement Solution.
4. RBC units must be phenotyped negative for the antigen which corresponds to the patient's antibody, unless the antibody is clinically insignificant or commercial antiserum for phenotyping is unavailable. Refer to SFOWI-0088 Antibody Identification for details.
5. Some of the clinically insignificant antibodies (not reacting at 37°C) are anti-P1, anti-Le(a), anti-Le(b), anti-M, anti-N, anti-Lu(a) and anti-A1. Perform AHG crossmatch using LISS Ortho Antibody Enhancement Solution. When clinically insignificant antibody reacts at 37°C under strict warm condition, it may be necessary to crossmatch antigen negative units at AHG phase unless commercial antisera is unavailable. Refer to SFOWI-0088 Antibody Identification for details.

**PROVUE**

| Step | Actions |
|---|---|
| 1 | Label a 12 x 75 mm test tube for each donor to be tested with barcoded unit#. |
| 2 | Dispense the entire content of one or two donor segments into each test tube. |
| 3 | Load patient sample and donor sample(s) onto the ProVue's sample carousel. |
| 4 | Load Anti-IgG Gel card(s) onto the 37C incubator and load Buffer Gel card(s) onto the RT incubator in the Provue. |
| 5 | Program the samples for both Crossmatch-IAT and Crossmatch-IS. |
| 6 | ProVue will interpret the compatibility results. |
| 7 | When tests are completed, print ProVue results and enter into LIS. Initials on printout. |
| 8 | Second CLS reviews the manual result entry accuracy and initials on the printout also. |

**IgG GEL**

<table>
<tr><th>Steps</th><th>Action</th></tr>
<tr><td>1</td><td>Prepare 0.8% cell suspension from a segment of the donor unit.
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<tr><th>Steps</th><th>Actions</th></tr>
<tr><td>a</td><td>Label the MTS Anti-IgG Card with the appropriate identification and test.</td></tr>
<tr><td>b</td><td>Remove foil of the wells that will be used for testing from card.</td></tr>
<tr><td>c</td><td>Add 50uL of 0.8% donor cells into microtube well at $45^{0}$ angle. Do not touch pipette to gel card.</td></tr>
<tr><td>d</td><td>Add 25uL of patient’s plasma at $90^{0}$ angle into the same well.</td></tr>
<tr><td>e</td><td>Incubate at $37^{o}$C for 15 minutes.</td></tr>
<tr><td>f</td><td>Centrifuge the gel card at 895±25 RPM for 10 minutes.</td></tr>
<tr><td>g</td><td>Read the front and the back of each microtube macroscopically. Record results</td></tr>
<tr><td>h</td><td>Cover microtube(s) with tape for review later.</td></tr>
<tr><td>i</td><td>Perform IS crossmatch by tube or Buffer Gel card to detect ABO incompatibility.</td></tr>
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<tr><td>3</td><td>Results
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<tr><td>Hemolysis (if serum is used) or agglutination of the red cells in a microtube of the gel card</td><td>Indicates incompatibility due to the presence of an antibody directed against the corresponding antigen that is present on the donor cells</td></tr>
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</table></td></tr>
</table>

| | | |
|---|---|---|
| | at the bottom of the microtube. | |
| | | |

**PEG**

| Step | Actions |
|---|---|
| 1 | Add 2 drops of patient's plasma/serum in a properly labeled test tube. |
| 2 | Add 1 drop of 2-5% donor cells. |
| 3 | Centrifuge at high speed for calibrated time. |
| 4 | Examine for agglutination (IS phase to detect ABO incompatibility). Record results. |
| 5 | Add 2 drops of PeG to each test tube |
| 6 | Mix and incubate at 37°C for 15 minutes. |
| 7 | Wash 3-4 times. |
| 8 | Add 2 drops anti-IgG. |
| 9 | Centrifuge at high speed for calibrated time. |
| 10 | Examine for agglutination (AHG phase) macroscopically and microscopically. Record results. |
| 11 | Confirm all negative tests by adding 1 drop of check cells. Record results. |

**LISS (Ortho Antibody Enhancement Solution)**

| Steps | Actions |
|---|---|
| 1 | Add 2 drops of plasma in a properly labeled test tube. |
| 2 | Add 1 drop of 2-5% donor cells. |
| 3 | Add 2 drops of LISS to each tube. |
| 4 | Mix and incubate at 37°C for 15 minutes. |
| 5 | Centrifuge. |
| 6 | Resuspend the cells and examine for agglutination ( 37°C phase). Record results. |
| 7 | Wash 3-4 times. |
| 8 | Add 2 drops anti-IgG. |
| 9 | Mix and centrifuge for calibrated time. |
| 10 | Resuspend and examine for agglutination (AHG phase) macroscopically. Record results. |
| 11 | Confirm negative reactions with 1 drop of check cells**.** Record results. |
| 12 | LISS Ortho Antibody Enhancement Solution detects ABO incompatibility, making immediate spin crossmatch unnecessary. |

**SALINE**

| Steps | Actions |
|---|---|
| 1 | Add 2-4 drops of patient's plasma into a properly labeled test tube. |
| 2 | Add 1 drop of 2-5% donor cells to the tube. |
| 3 | Mix and centrifuge at high speed for calibrated time. |
| 4 | Examine for agglutination (IS phase to detect ABO incompatibility). Record results. |
| 5 | Incubate at 37°C for 30-60 minutes. |
| 6 | Centrifuge at high speed for calibrated time. |
| 7 | Observe for hemolysis. |
| 8 | Resuspend and examine macroscopically for agglutination (37°C phase). Record |

| | |
|---|---|
| | results. |
| 9 | Wash 3-4 times |
| 10 | Add 2 drops anti-IgG. |
| 11 | Mix well and centrifuge at high speed for calibrated time. |
| 12 | Resuspend and examine for agglutination (AHG phase). Record results. |
| 13 | Confirm negative result by adding 1 drop of check cells. Record results. |

**PREWARMED**

***Caution:*** Prewarmed technique has been shown to result in decreased reactivity of some potentially significant antibodies and caused weak antibodies to be missed. Do not use this technique to eliminate unidentified reactivity.

**PREWARMED TUBE**

| Steps | Actions |
|---|---|
| 1 | Prewarm a bottle of saline to 37°C. |
| 2 | Add 1 drop of 2-5% donor cells to properly labeled tube. |
| 3 | Place a small volume of the patient's plasma in another labeled test tube. |
| 4 | Incubate the donor cells and patient's plasma separately at 37°C for 5-10 minutes . |
| 5 | Add 2-4 drops of prewarmed plasma to each tube containing prewarmed RBCs. Mix the tubes without removing them from the heat block. |
| 6 | Incubate for 30-60 minutes. |
| 7 | Wash at least 3 times with prewarmed saline. |
| 8 | Add 2 drops anti-IgG. |
| 9 | Mix well and centrifuge. |
| 10 | Resuspend and examine for agglutination. Record results. |
| 11 | Confirm negative result by adding 1 drop of check cells. Record results. |
| 12 | Perform IS crossmatch by Tube or Buffer Gel card to detect ABO incompatibility. |

**PREWARMED GEL**

| Steps | Actions |
|---|---|
| 1 | Label the MTS Anti-IgG Card with the appropriate identification and test information. |
| 2 | Remove the foil from the microtubes to be used. |
| 3 | Place a small aliquot of the 0.8% of the donor cells in a test tube in the MTS incubator for 5-10 minutes. |
| 4 | Place the card and an aliquot of the plasma in the MTS incubator for 5 to 10 minutes. |
| 5 | Add 50uL of 0.8% donor cells into microtube well at 45° angle. Do not touch pipette to gel card. |
| 6 | While keeping the card in the incubator, add 25uL of prewarmed plasma at 90° angle into the same well. |
| 7 | Incubate at 37±2°C for 15 minutes. Refer to package insert for comment on extending incubation times. |
| 8 | Centrifuge the gel card at 895±25 RPMs for 10 minutes. |
| 9 | Read front and back of the card. Record results. |
| 10 | Cover microtube(s) with tape for review later. |
| 12 | Perform IS crossmatch by Tube or Buffer Gel card to detect ABO |

| | |
|---|---|
| | incompatibility. |

**SUMMARY TABLE FOR CROSSMATCH METHODS**

**NOTE:** Include immediate spin crossmatch by Tube or Buffer Gel card when performing IAT crossmatch, except when using LISS Ortho Antibody Enhancement Solution, to demonstrate ABO incompatibility.

| Methods | Donor Cells | Patient's Plasma | Incubation | Reading Phase |
|---|---|---|---|---|
| IMMEDIATE SPIN (TUBE) | 1 drop | 2 drops | None | IS |
| IMMEDIATE SPIN (GEL) | 50uL 0.8% | 50uL | None | IS |
| GEL IAT | 50uL 0.8% | 25uL | 15 min, 37°C | AHG |
| PEG (the number of drops should equal the drops of plasma) | 1 drop | 2-4 drops | 15 min, 37°C | AHG |
| LISS (the number of drops should equal the drops of plasma) | 1 drop | 2 drops | 15 min, 37°C | 37°C and AHG |
| SALINE | 1 drop | 2-4 drops | 30-60 min, 37°C | 37°C and AHG |
| PREWARMED | 1 drop prewarmed cells | 2-4 drops prewarmed plasma | 30-60 min, 37°C | Wash with prewarmed saline, AHG |
| PREWARMED GEL | 50uL prewarmed 0.8% cells in gel card | 25uL prewarmed plasma | 15 min, 37°C | AHG |

## E. CHRONICALLY TRANSFUSED PATIENTS

**Refer to SFOWI-0096, Antigen Typing SOP for selection of RBCs for the following patients:**

1. Sickle Cell Disease
2. Thalassemia Major e.g. Cooley's Anemia
3. Autoimmune Hemolytic Anemia e.g. WAIHA, Cold Agglutinin Disease, PCH
4. Congenital Anemia e.g. Diamond Blackfan Anemia, Fanconi Anemia

## F. INCOMPATIBLE CROSSMATCH DUE TO AUTOANTIBODY

1. For patients with **warm autoantibody,** crossmatch will be incompatible and least incompatible units should be given if underlying alloantibody(s) has been ruled out.
2. **If underlying alloantibodies cannot be ruled out**, blood that is phenotypically matched with the patient can be crossmatched.
3. Notify the patient's physician as soon as possible. Physician's approval is required for release of incompatible crossmatched RBC.
   a. The physician must sign the 'PHYSICIAN'S APPROVAL FOR TRANSFUSION OF INCOMPATIBLE CROSSMATCHED RBCs' form which is valid for the duration of the current T/S.
   b. I f the physician only wants to approve individual RBC unit, he/she can sign on each product chart copy stamped/written with the following:

Provider # _____ Date _____
Approve to transfuse the least incompatible RBC by
MD _____

**G. SWITCHING from Rh Neg to Rh Pos RBCs**

1. Rh Neg patients (females over 50 years old and males over 1 year old) can be switched to Rh Pos RBCs in the following situations:
   a. BCP is unable to supply compatible Rh Neg RBCs due to shortage
   b. Patient's continued transfusion e.g. profuse bleed or MTP, will deplete the **O Neg** RBCs inventory
2. Notify the attending physician immediately and the pathologist of the need to switch and document.
3. Follow up with BCP as necessary to get updates as to when the Rh Neg RBCs inventory can be replenished.

**H. TRANSFUSION SERVICE CROSSMATCH REPORT/TAG**

1. After the crossmatch results is entered and verified in the computer system a Transfusion Service Crossmatch Report/Product Chart Copy with an adhesive label will be generated.
2. The Crossmatch Report and Crossmatch label must have the following information:
   a. Patient's/Recipient's full name.
   b. Patient's/Recipient's medical record number
   c. Patient's Group and Rh
   d. Donor Unit Number
   e. Donor Unit Group and Rh
   f. Donor Unit Expiration Date
   g. Technologist initials.
   h. Indication that the unit is compatible, incompatible, etc.
   i. Donor unit blood attributes if applicable.
3. Affix the Transfusion Service Crossmatch label to the back of each unit before issuance. The label shall remain attached on the unit until completion of the transfusion.
4. Affix one Prepare RBC accession# aliquot label to the top right quadrant of each yellow copy of the Transfusion Report. Discard any extra aliquot label.
5. Paper clip the Transfusion Report/Product Chart Copy with the requisition and file.

**PROCEDURAL NOTES**

A. Plasma, platelets (that contains less than 2 mL RBC) or cryoprecipitate do not require crossmatch.

B. Perform **IS crossmatch** of **Apheresis Granulocytes and bloody Platelets** (which contains more than 2 mL RBCs) with the recipient's plasma unless patient has atypical antibody which requires AHG crossmatch instead. The donor blood cells for crossmatch may be obtained from a sample collected at the time of donation, otherwise a segment from the unit can be used.

C. It is rare for the antiglobulin phase of the crossmatch to detect a clinically significant antibody if the patient's antibody screen test is negative. An antibody to a low incidence antigen may cause incompatible crossmatch if the antigen is present on the donor cells. Even with the advances in blood group serology, compatibility testing will not detect all unexpected antibodies, nor will it guarantee normal survival of transfused cells.

D. Electronic crossmatch can be used in massive transfusion protocol when the patient is qualified.
E. Record results as the test is read.

**REFERENCE(S)**

A. AABB, Technical Manual, current edition, Bethesda, MD.
B. AABB, Standards for Blood Banks & Transfusion Services, current edition, Bethesda, MD.
C. Manufacturer's Inserts, current revision.

## Associated Documents:

External Documents

Associated Documents:

SFOWI-0088 -- TS-Antibody Identification
SFOWI-0096 -- TS-Antigen Typing
SFOWI-0111 -- TS-Dispensing Blood and Blood Components
SFOWI-0113 -- TS-Urgent requirements for Blood and Components
SFOWI-0110 -- TS-Massive Transfusion

Click to Open an Associated Document

## Documents Generated:

## Document Revision History:

| | | |
|---|---|---|
| **Revision:** 22 | **Date Created:** 09/21/2005<br>**Date of Last Revision:** 05/01/2018 | **Last Approval Date:** 12/18/2017 |

| | |
|---|---|
| **Document Author:**<br>Cara H Lim/CA/KAIPERM | **Document Manager:**<br>Richard Chui/CA/KAIPERM |

## Reason for Change:

| Revision: | Sec/Para Changed | Change Made: | Date |
|---|---|---|---|
| 1 | Procedure | Add compatible RBC selection table | 1/19/07 |
| 1 | Approver | New Lab Director | 2/22/07 |
| 2 | Procedure | Change to RILIS history documentation and Crossmatch Tag | 5/6/07 |
| 3 | Procedure | Delete using ATCK as blood type recheck. | 5/15/07 |
| 4 | Approver | New Lab Director | 7/1/07 |
| 5 | Procedure note | Autologous units requires crossmatch | 2/24/08 |
| 6 | Procedure | Add electronic crossmatch | 8/1/09 |
| 7 | Procedure | Added Step 2 under PEG table. | 10/8/09 |
| 8 | Procedure A.1.a. | Added Electronic Crossmatch Eligibility Table | 3/29/10 |
| 9 | Procedure<br><br><br><br><br><br><br>Procedural Notes D.<br><br>Approver | Included IS crossmatch when performing AHG crossmatch (except when using Ortho LISS) to detect ABO incompatibility.<br>Crossmatch on demand for non-surgical patients.<br>Added Provue crossmatch.<br>Perform IS crossmatch when the historical ABORh has not uploaded to RM.<br>Perform AHG crossmatch using LISS Ortho Antibody Enhancement Solution for clinically insignificant antibodies NOT reacting at 37C.<br>Perform DAT on donor cell<br>Perform an antibody screen and antibody panel at immediate spin and room temperature.<br>Change Medical Director. | 6/1/11 |
| 10 | Procedure B. Gel. 2. 5<br>Procedure A.1.e | Added 'Skip this step for buffer gel card crossmatch.'<br>Added Computer crossmatch dispense. | 9/12/11 |

| | | | |
|---|---|---|---|
| | Procedural Note(s) | Added 'An antibody to a low incidence antigen may cause incompatible crossmatch if the antigen is present on the donor cells.' | |
| 11 | Specimen and Requisition<br>Controls B.<br>Controls C.<br><br><br><br>Controls F.<br><br><br>Controls D.<br><br>Controls G.<br>Procedure A.2.a.ii.<br><br>Procedure A.2.c. | Added 'and Requisition'.<br>Added '(one must be current and performed locally)'.<br>Added 'All identifying data on the transfusion requisition must be matched to the specimen label before compatibility testing. Aliases are acceptable if documented in HealthConnect demographics.'<br>Added 'Autologous units require crossmatch whether serologic (IS or Extended) or electronic depending on the patient's antibody screen and antibody history.'<br>Added 'If ABORh discrepancy cannot be resolved before blood is needed, then O Neg RBCs will be selected for crossmatch.'<br>Added table.<br>Added 'NOTE: All recipients must receive ABO group specific whole blood.'<br>Moved paragraph from Procedural Notes. | 10/20/11 |
| 12 | Procedure A. Not Eligible for Computer Crossmatch Table under Neonates | Changed to '-see SFOWI-0105 Neonatal Transfusion SOP for details'. | 2/24/12 |
| 13 | Approver | New Lab Director | 1/28/13 |
| 14 | Procedure Note(s) E. | New. | 3/26/13 |
| 15 | Approver<br>Controls E., I. & J.<br>Procedure C.<br>Procedure<br><br>Procedure E. | New BB Medical Director.<br>New.<br>New.<br>Moved Compatibility Table for PRBCs to beginning of Procedure. Added Compatibility Table for Whole blood.<br>New. Added to reflect current practice. | 8/1/13 |
| 16 | Procedure E.1.<br><br>Procedure B.4. & 5. | Added 'over 1 year old' for male Rh Neg patients to align with SFOWI-0110 MTP.<br>Added reference to SFOWI-0088 Antibody Identification. | 8/21/14 |
| 17 | Purpose<br>Procedure A.1. | Added 'including for autologous red cell units'.<br>Changed Pre-Op 14 Days to Pre-Op 30 days. | 8/13/15 |
| 18 | Procedure<br><br>Procedure A.<br><br>Table 'Eligible for Computer Crossmatch'<br>Procedure B.2.c.<br><br>Procedure B.2.d.<br><br>Summary Table for Crosmatch Method<br>Gel Method (whole procedure) | Changed list level and numbering. Reformatted paragraphs in Procedure B.<br>Deleted specimen expiration days and revised to 'Specimen with current Type & Screen'.<br>Added 'No allo or auto antibody is identified' to 'Transfusion Reaction serological workup is negative'.<br>Added instructions for performing Buffer Gel XMIS (instructions were embedded as part of Gel IAT procedure prior to this revision).<br>Added instructions to wash donor cells as first option. Deleted instructions to warm plasma and donor cells.<br>Added NOTE to include XMIS with IAT XM except when using LISS as per current practice. Added summary procedure for Buffer Gel XMIS.<br>Specified $45^{0}$ angle when adding reagent cells and $90^{0}$ angle when adding patient plasma as per current practice. | 1/5/16 |
| 19 | Approver | New CLIA Director. | 9/28/16 |
| 20 | Procedure B.2.c. | Replaced IgG with Buffer. | 2/28/17 |
| 21 | Procedure B.<br><br>Procedure C.2.c. | New section. Added reading and interpretation of serologic compatibility tests.<br>Previously Procedure B. Changed plasma volume. | 12/11/17 |
| 22 | Procedure H.<br><br><br>Procedure D. PeG XM #10<br>Procedure D. Prewarmed | Revised due to implementation of BPAM scheduled 3/20/18. Added instructions to affix a Prepare RBC aliquot accession label to the yellow copy of the crossmatch report.<br>Added instructions to read AHG phase microscopically also.<br>Added Caution statement for using prewarmed technique. | 3/6/18 |

## Notification List:

## Approvals:

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**Document History Section**