| University of Washington Medical Center<br>1959 NE Pacific Street. Seattle, WA, 98195<br>Transfusion Services Laboratory<br>Policies and Procedures Manual | Original Effective Date:<br>03-11-2016<br>Revision Effective Date:<br>05-23-2022 | Number:<br>PC-0021.02 |
|---|---|---|
| TITLE: **Antibody Screen Testing** | | |

## PURPOSE:
To provide instructions to screen specimens for unexpected antibodies

## PRINCIPLE & CLINICAL SIGNIFICANCE:
### Principle
Testing is performed to detect clinically significant antibodies to RBC antigens, which are defined as those that have been previously associated with hemolytic disease of fetus and newborn, hemolytic transfusion reactions or decreased RBC survival. Typically, these antibodies react at 37°C or AHG phase.

### Clinical Significance
Transfusion of incompatible RBCs can have serious consequences, including renal failure and death.

## POLICIES:
- Current antibody screen testing is required prior to release of RBCs for transfusion except for emergency uncrossmatched blood
- Negative antibody screens on infants are considered valid for the first four months of life and do not need to be repeated every 3 days unless the patient is discharge. If discharged and readmitted, a new antibody screen is required
- Positive antibody screens:
    - When antibodies are detected, additional testing shall be performed to identify antibodies of clinical significance
    - In patients with a history of previously identified antibodies, methods of testing shall be capable of detecting the presence of and identifying newly formed clinically significant antibodies
- Perform the following history check for first time positive antibody screens
    - Contact the patient's provider or RN regarding the patient transfusion history including transfusion at prior institutions. If patient has a history at another institution, contact the institution for transfusion and prior history of antibodies
    - Contact the local blood supplier for relevant transfusion and prior history of antibodies
- Providers are notified of newly positive antibody screens and when antibodies workups may cause a delay providing blood components
- An AHG phase crossmatch is required when the current antibody screen is positive, or patient has a history of a clinically significant antibody

## SPECIMEN REQUIREMENTS:
EDTA is preferred and if not tested soon after collection, should be stored at 1-6°C
Red top tubes are acceptable
Refer to SOP *Specimen Acceptability and Order Receipt*

## REAGENTS/SUPPLIES/EQUIPMENT:

| Reagents: | Supplies: | Equipment: |
|---|---|---|
| • Antibody screening cells<br>• LISS<br>• PEG<br>• Blood Bank Saline<br>• Anti-IgG<br>• IgG coated control cells | • 12 x 75 mm glass tubes<br>• Transfer pipettes | • Calibrated cell washer<br>• Calibrated serologic centrifuge<br>• 37°C Heat Block<br>• Agglutination viewer<br>• Vision analyzer |

**NOTE:** Reagents, supplies and equipment vary depending on the method used for testing

## QUALITY CONTROL:

Reagent QC is performed daily or day of use

## INSTRUCTIONS:

<table>
<tr><th>STEP</th><th>ACTION</th></tr>
<tr><td>1</td><td>Perform antibody screen test using approved method:<br>• Primary<br>○ Vision (automated) (refer to SOP Ortho Vision Patient and Donor Testing)<br>○ PeG (manual) (refer to SOP PeG Indirect Antiglobulin Technique)<br>• Back-up methods to be used if primary method is unavailable or sample characteristics limit the usefulness of primary testing<br>○ LISS technique (refer to SOP LISS Indirect Antiglobulin Technique)<br>○ Pre-warm technique (refer to SOP Pre-Warm Technique)</td></tr>
<tr><td>2</td><td>Compare the current antibody screen results to historical results if available
<table>
<tr><th colspan="2">If Antibody Screen is</th><th rowspan="2">Then</th></tr>
<tr><th>Historical</th><th>Current</th></tr>
<tr><td>Negative/ Not Found</td><td>Negative</td><td rowspan="2">No additional testing is required</td></tr>
<tr><td>Positive</td><td>Negative</td></tr>
<tr><td>Negative/ Not Found</td><td>Positive</td><td>• Notify RN or provider of newly positive antibody and potential delay in RBC availability – refer to SOP Reporting Patient Test Results and Verbal Provider Notification<br>• Perform an outside history check by:<br>○ Contact the patient provider or RN regarding the patient transfusion history including transfusion at prior institutions. If patient has a history at another institution, contact the outside institution for transfusion and prior history of antibodies<br>○ Contact the local blood supplier for relevant transfusion and prior history of antibodies</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>STEP</th><th>ACTION</th></tr>
<tr><td></td><td>
<table>
<tr><td></td><td></td><td>• Perform a full antibody identification workup – refer to SOP Antibody Identification</td></tr>
<tr><td colspan="2">If Antibody Screen is</td><td rowspan="2">Then</td></tr>
<tr><td>Historical</td><td>Current</td></tr>
<tr><td>Positive</td><td>Positive</td><td>• Notify RN or provider of potential delay if RBC order is pending – refer to SOP Reporting Patient Test Results and Verbal Provider Notification
<table>
<tr><th>If</th><th>Then</th></tr>
<tr><td>Reaction pattern consistent with historical antibody</td><td>Perform select cells to rule out all other clinically significant alloantibodies – refer to SOP Antibody Identification<br><br>NOTE: An alternate method may be utilized to perform rule outs.<br><br>EXAMPLE: LISS antibody screen in the presence of known warm auto antibody</td></tr>
<tr><th>If <u>any</u> apply</th><th>Then</th></tr>
<tr><td>• Reaction pattern not consistent with historical antibody<br>• Unexplained hemolysis</td><td>Perform a full antibody identification workup – refer to SOP Antibody Identification</td></tr>
</table></td></tr>
</table>
</td></tr>
</table>

## CALCULATIONS/INTERPRETATIONS/RESULTS REPORTING/NORMAL VALUES/CRITICAL VALUES

**INTERPRETATION:**
Refer to applicable SOPs

**RESULTS REPORTING IN SUNQUEST:**

<table>
<tr><th>STEP</th><th>ACTION</th></tr>
<tr><td>1</td><td>Record reactions immediately upon reading in Sunquest Blood Order Processing (BOP) or appropriate form</td></tr>
<tr><td>2</td><td>
<table>
<tr><th>If Method is</th><th>Then</th></tr>
<tr><td>Vision</td><td>Refer to SOP Ortho Vision Results Management</td></tr>
<tr><td>PeG</td><td>Record tests as follows:
<table>
<tr><th>Phase</th><th>Result</th></tr>
<tr><td>INC</td><td>ND or H<br>*If hemolysis is noted after incubation, report using H. If no hemolysis noted, report as ND</td></tr>
<tr><td>AHG</td><td>0 or +</td></tr>
<tr><td>CC</td><td>ND or + depending on AHG result<br>**Check Cells are only performed on negative AHG reactions</td></tr>
</table>
+ = Any positive reaction, including hemolysis, enter reaction strength observed using appropriate numerical key<br>
0 = Negative reaction<br>
ND = Not Done, enter using “N” key<br>
EXAMPLES:
<table>
<tr><th></th><th>INC</th><th>AHG</th><th>CC</th><th>Interp</th><th>Sunquest Hot Key</th></tr>
<tr><td>SC1</td><td>ND</td><td>0</td><td>+</td><td rowspan="3">Neg</td><td rowspan="3">N</td></tr>
<tr><td>SC2</td><td>ND</td><td>0</td><td>+</td></tr>
<tr><td>SC3</td><td>ND</td><td>0</td><td>+</td></tr>
</table>
<table>
<tr><th></th><th>INC</th><th>AHG</th><th>CC</th><th>Interp</th><th>Sunquest Hot Key</th></tr>
<tr><td>SC1</td><td>*ND</td><td>0 or +</td><td>ND or +**</td><td rowspan="3">Pos</td><td rowspan="3">P</td></tr>
<tr><td>SC2</td><td>*ND</td><td>0 or +</td><td>ND or +**</td></tr>
<tr><td>SC3</td><td>*ND</td><td>0 or +</td><td>ND or +**</td></tr>
</table>
*NOTE: Although a reading is not performed at incubation, hemolysis in noted prior to washing should be documented using “H” in the INC field</td></tr>
<tr><td>LISS</td><td>Record tests as follows:
<table>
<tr><th>Phase</th><th>Result</th></tr>
<tr><td>INC</td><td>0 or +</td></tr>
<tr><td>AHG</td><td>0 or +</td></tr>
<tr><td>CC</td><td>ND or + depending on AHG result<br>**Check Cells are only performed on negative AHG reactions</td></tr>
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</table>

**+** = Any positive reaction, including hemolysis, enter reaction strength observed using appropriate numerical key
**0** = Negative reaction
**ND** = Not Done, enter using "N" key

**EXAMPLES:**

| | INC | AHG | CC | Interp | Sunquest Hot Key |
|---|---|---|---|---|---|
| SC1 | 0 | 0 | + | Neg | N |
| SC2 | 0 | 0 | + | | |
| SC3 | 0 | 0 | + | | |

| | INC | AHG | CC | Interp | Sunquest Hot Key |
|---|---|---|---|---|---|
| SC1 | 0 or + | 0 or + | ND or +** | Pos | P |
| SC2 | 0 or + | 0 or + | ND or +** | | |
| SC3 | 0 or + | 0 or + | ND or +** | | |

**STEP 3**

| If antibody screen is | Then |
|---|---|
| Positive | Add an ABID (;ABI) to the battery |
| Negative | No further action |

## CALIBRATION:
NA

## PROCEDURE NOTES AND LIMITATIONS:
- False positives or false negatives can occur from bacterial or chemical contamination of test materials, inadequate incubation time or temperature, improper centrifugation, inadequate washing of RBCs, improper storage of test materials and omission of test plasma, LISS, PEG or AHG
- False negative may result if an inappropriate plasma-to-cell ratio is used, the antibody's concentration in plasma is below detection level or if the cells selected for testing do not contain the corresponding antigen such as a low frequency antigen (ex. Kpa)
- No single test method can detect all unexpected clinically significant alloantibodies

## REFERENCES:

- Technical Manual. Bethesda, MD: AABB Press, current edition
- Standards for Blood Banks and Transfusion Services. Bethesda, MD: AABB Press, current edition


## RELATED DOCUMENTS:
SOP *Ortho Vision Patient and Donor Testing*
SOP *Ortho Vision Results Management*
SOP *PeG Indirect Antiglobulin Technique*

SOP *LISS Indirect Antiglobulin Technique*
SOP *Pre-Warm Technique*
SOP *Specimen Acceptability and Order Receipt*
SOP *Antibody Identification*

| **UWMC SOP Approval:** | | | |
|---|---|---|---|
| **UWMC CLIA Medical Director** | Andrew Bryan, MD | Date | |
| **Transfusion Service Manager** | Nina Sen | Date | |
| **QA Manager** | Tayler Reeves | Date | |
| **Transfusion Service Medical Director** | Monica Pagano, MD | Date | |
| **UWMC Biennial Review:** | | | |
| | | Date | |
| | | Date | |

12/15/2020:Updated automated testing to Vision
06/17/2021: Changed frequency of antibody identification for repeat positive antibody screens, added instructions for performing outside history check for newly positive antibody screens