University of Washington Medical Center 1959 NE Pacific Street. Seattle, WA 98195 Transfusion Services Laboratory Policies and Procedures Manual	Original Effective Date: 03-14-16 Revision Effective Date:	Number: PC-0008.02

TITLE: **Massive Transfusion and OB Hemorrhage Protocols**

PURPOSE:

To describe the protocol used by the Transfusion Service Laboratory (TSL) to respond to an anticipated large volume hemorrhage including Massive Transfusion Protocol (MTP) and OB hemorrhage in adult and pediatric patients.

PRINCIPLE & CLINICAL SIGNIFICANCE:

Rapid replacement of blood volume is essential to reducing morbidity and mortality associated with massive hemorrhage

Massive Transfusion is defined as:

- Replacement of 30% total blood volume (TBV) within 2 hours (4U PRBC in adult)
- Replacement of 50% TBV within 3 hours (5-6U PRBC in adult)
- Replacement of 100% TBV within 24hrs (10-12U PRBC in adult)

POLICIES:

- Universal blood components will be supplied until required testing is completed.
- A pre-transfusion specimen is NOT required prior to activation of the protocol but should be collected as soon as possible, preferably prior to the start of transfusion
- The Transfusion Service Laboratory (TSL) will maintain the following at each location (NN601, BB2):
  - 4 O Negative RBCs
  - 4 O Positive RBCs
  - 2 units of thawed AB plasma
- Activation of an MTP or OB Hemorrhage Protocol is initiated by the patient's physician or anesthesia provider
  - Protocols may be activated verbally or in writing anytime there is a severe hemorrhage/blood loss or a massive transfusion is anticipated.
  - Orders may be placed in ORCA or written on a manual order form. Orders placed in ORCA will print in the TSL. Written orders may be preceded or followed by a phone call alerting the TSL of activation.
- Notify the TSL POC (physician on call)/Resident/Covering Physician when:
  - MTP or OB Hemorrhage protocol is activated
  - The number of blood product ordered and issued is consistent with levels seen with massive hemorrhage, but a protocol has not been activated

SPECIMEN REQUIREMENTS:
EDTA is preferred and if not tested soon after collection, should be stored at 2-8C.
Red top tubes are acceptable.
See SOP *Specimen Acceptability*

REAGENTS/SUPPLIES/EQUIPMENT:

Reagents:	Supplies:	Equipment:
NA	• 'Uncrossmatched' stickers • 'Do Not Refrigerate' stickers • Emergency Release of Uncrossmatched Blood Form • Transfusion Record • Manual Requisition	• BB LIS • Bar-code scanner

QUALITY CONTROL:
NA

INSTRUCTIONS:
The following steps may be performed in an order other than written to provide blood components as quickly as possible in a bleeding emergency

<table>
<tr><th>STEP</th><th>ACTION</th></tr>
<tr><td>1</td><td>Activation of protocol:
<table>
<tr><th>If activation is</th><th>Then</th></tr>
<tr><td>Verbal only</td><td>Record the following on a manual requisition
• Patient medical record number
• Patient full name
• Patient gender and age
• Ordering provider
• Location to deliver the blood components
• Time of activation (time of the phone call)</td></tr>
<tr><td>Written</td><td>Go to next step</td></tr>
</table>
NOTE: Do not delay issue of blood components while waiting for samples to arrive in lab. Release universal components until appropriate testing has been completed</td></tr>
<tr><td>2</td><td>• Place or receive orders for plasma in Sunquest
• Place or receive platelets and cryoprecipitate, if requested
<table>
<tr><th>Component</th><th>Order Code</th></tr>
<tr><td>Plasma</td><td>TFFP</td></tr>
<tr><td>Cryoprecipitate</td><td>TCRY</td></tr>
<tr><td>Platelets</td><td>TPLT</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>STEP</th><th>ACTION</th></tr>
<tr><td>3</td><td>Select appropriate products for issue based on patient's age, gender and status of current pretransfusion testing. See SOP Emergency Release of Blood Products
<table>
<tr><th>If</th><th>Select and issue the following immediately</th><th>Prepare and issue when specifically requested</th></tr>
<tr><td>≥ 15 years age</td><td>• 4 RBC
• 4 thawed plasma</td><td rowspan="2">• 1 platelet dose
• 1 pooled cryoprecipitate (thawed upon request)</td></tr>
<tr><td>< 15 years age</td><td>• 3 RBC
• 3 thawed plasma</td></tr>
</table></td></tr>
<tr><td>4</td><td>Preparing RBCs:
<table>
<tr><th>If pretransfusion testing is</th><th>Then</th></tr>
<tr><td>Incomplete or recipient ineligible for electronic crossmatch</td><td>• Ensure 'Uncrossmatched' stickers are on each component
• Issue uncrossmatched RBCs (refer to SOP Emergency Release of Blood Products</td></tr>
<tr><td>Complete and recipient eligible for electronic crossmatch</td><td>Perform electronic and release compatible units unless doing so would result in a delay</td></tr>
</table></td></tr>
<tr><td>5</td><td>Preparing Plasma:
• Select thawed AB Plasma from emergency stock. ABO compatible plasma may be used if thawed and will not cause delay
• Contact the other TSL location to coordinate the delivery of plasma to the patient location. Provide the name and medical record number of the patient.

NOTE:
• Two thawed AB plasma components are stored in each location
• Refer to SOPs Blood Component Preparation, Helmer Plasma Thawer: Operation and Maintenance and Selection of Blood Components for Transfusion</td></tr>
<tr><td>6</td><td>Preparing Platelets and Cryoprecipitate if requested:
• Apply 'Do Not Refrigerate' stickers to the component containers
• Allocate components
• Thaw and prepare cryoprecipitate refer to SOPs Blood Component Preparation, Helmer Plasma Thawer: Operation and Maintenance and Selection of Blood Components for Transfusion</td></tr>
<tr><td>7</td><td>Issuing Blood Components:
• Rubber band the Transfusion Records to the blood components
• Issue using the manual downtime process on a Downtime Issue Log when issue in Sunquest will cause delay or the recipient is not registered in SQ</td></tr>
<tr><td>8</td><td>Place the following documents in a sealed plastic bag and send with the blood components for the provider to sign and return to the TSL
<table>
<tr><th>If</th><th>Send</th></tr>
<tr><td>Issuing Uncrossmatched RBCs</td><td>Emergency Release of Uncrossmatched Blood Form</td></tr>
<tr><td>Order placed verbally without</td><td>Manual Requisition Form completed by the TSL</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>STEP</th><th>ACTION</th></tr>
<tr><td></td><td>provider signed order</td></tr>
<tr><td>9</td><td>Deliver components in the quickest method available:

Important: Do not delay delivery when a portable refrigerator is not available
<table>
<tr><th>Method of Delivery</th><th>Then</th></tr>
<tr><td>Pneumatic tube system</td><td>• Do not send refrigerated and warm components in the same carrier
• Notify the clinical area to expect multiple carriers via pneumatic tube</td></tr>
<tr><td>Pneumatic tube system & portable refrigerator/ validated transport container</td><td>• Send two RBCs to the patient care area
• Notify the clinical area to expect delivery via pneumatic tube
• Follow the first two RBCs with the remaining RBCs and plasma components in a portable refrigerator</td></tr>
<tr><td>Portable refrigerator/ validated transport container</td><td>• Send all products</td></tr>
<tr><td>No Portable Refrigerator or validated transport container</td><td>• Pack in blood supplier shipping container(s) separating refrigerated from warm components</td></tr>
</table>
NOTE: If platelets or cryoprecipitate are ordered, be sure they are transported outside of the refrigerator</td></tr>
<tr><td>10</td><td>Record the following on the Communication Log:
• Time Protocol was activated
• Name of patient
• Medical record number</td></tr>
<tr><td>11</td><td>Notify the TSL physician-on-call (POC) of the protocol activation and record the following on the Communication Log:
• Name of TSL POC
• Time of notification</td></tr>
<tr><td>12</td><td>Replace stock uncrossmatched RBCs and thawed plasma as soon as possible upon issue</td></tr>
<tr><td>13</td><td>Closely monitor inventory levels and reorder from the blood supplier as necessary to prevent delays due to stock availability</td></tr>
<tr><td>14</td><td>Coordinate exchange of universal donor type blood components with crossmatched compatible inventory, if appropriate once testing is completed</td></tr>
<tr><td>15</td><td>Notify the patient’s provider and TSL POC if the patient has antibodies or antibodies are identified during MTP</td></tr>
<tr><td>16</td><td>Issue products in SQ as soon as possible following release on the manual Downtime Issue Log</td></tr>
</table>

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

NA

CALIBRATION:
NA

NOTES AND LIMITATIONS:
NA

REFERENCES:
AABB Standards for Blood Banks and Transfusion Services, Bethesda, MD, Current edition.

RELATED DOCUMENTS:
SOP Emergency Release of Blood Products
SOP Issuing Blood Components
SOP Ordering Blood Components
SOP Blood Component Preparation
SOP Helmer Plasma Thawer: Operation and Maintenance
SOP Selection of Blood Components for Transfusion
FORM Portable Refrigerator Log
FORM Emergency Release of Uncrossmatched Blood
FORM Transfusion Record
FORM Downtime Issue Log

APPENDICES:
NA

UWMC SOP Approval:

UWMC CLIA Medical Director _____ Mark H. Wener, MD Date _____

Transfusion Service Manager	_____ Nina Sen	Date	_____
Compliance Analyst	_____ Christine Clark	Date	_____
Transfusion Service Medical Director	_____ Monica Pagano, MD	Date	_____
UWMC Biennial Review:			
	_____	Date	_____
	_____	Date	_____

REVISION:

1-18-19: Provided alternate methods of delivery. Removed cryoprecipitate from automatic issue with an MTP. Other minor clarification edits.