#### Massive Transfusion Protocol

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| Purpose | The purpose of this procedure is to provide a mechanism for quick response to the blood demands of a rapidly bleeding patient that has the potential to need total blood volume replacement within minutes to hours. This is defined as 8-10 units for an adult and an exchange transfusion for infant. |

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| Policy | * Massive Transfusion Protocol order will consist of:
1. Immediate allocation and delivery within 5 minutes of 6 units of UNXM blood and 6 single or 3 Jumbo units of Emergent plasma. Followed by thawing of type compatible or universal donor FFP to achieve a 1:1 ratio with issued RBCs.
2. Prepare additional storage device maintaining 6:6:1 ratio of RBC/FFP and Plateletpheresis. Deliver 6 additional units of RBCs, 6 equivalent plasma in mobile storage device with 1 Plateletpheresis to requested location. Pre-prepared O Pos units will be issued for males or females over 50. O Neg units will be prepared for potential child bearing females under 50, until Rh type can be determined, while supply lasts or unless physician approves use of Rh pos units.
3. Continued preparation of products in mobile storage devices to maintain keep ahead of 6 PRBC, 6 equivalent plasma and allocation of 1 plateletphersis to maintain 6:6:1 ratios in each device. Thaw, allocate and deliver 2 Cryo Pools with the 3rd Cooler/storage device
4. Type and Cross units, as time permits.
* Massive Transfusion Protocol will be activated upon receipt of verbal request and will continue until DC’d per physician request.
* Order will be processed using Downtime procedures. EPIC order will follow as time permits.
* Trauma Services will review cases for designated performance indicators including wastage of blood products
* OB Hemorrhage Protocol follows a similar guideline except the volumes are reduced:

 4 PRBC/4 FFP/1Plateletphersis |

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| Procedure: Nursing |  |
| Step | Action |
| 1. | Nursing personnel will call Transfusion Service at Ext. 11187 to alert them to activation of MTP protocol. |
| 2. | Physician or RN will order MTP in EPIC as time permits |
| 3. | Verify patient identification with lab personnel at time of issue. Sign and date Issue log.  |
| 4. | Verify patient identification against unit tag before transfusion of unit. |
| 5. | Document verification of patient identification and transfusion of each unit on the Massive Transfusion Protocol Documentation form. |
| 6. | Notify Transfusion Service if patient is moved prior to delivery of the mobile refrigerator. |
| 7. | Notify Transfusion Service when MTP is deactivated. |

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| Procedure: Transfusion Service Technologist |  |

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| 1. | Document initiation of order by filling out top portion of “Request for Issue of Uncrossmatched Blood” form. |
| 2. | Using “Issue of Uncrossmatched Blood” procedure, immediately prepare Uncrossmatched units and Emergent plasma for issue  |
| 3. | Pack units into cooler for delivery and follow up with mobile storage device. Each Cooler/storage device will contain products in ratioNOTE: Mobilization of storage device prior to 1st issuing a Cooler may delay response. If requested, document request, requestor name and time of request using a BBC comment. |
| 4. | Immediately begin thawing additional FFP as needed to maintain 1:1 RBC/plasma ratios and allocate platelets. * Thaw 2 Cryo Pools when preparing 3rd device.
 |
| 5. | Continue to have 6 units of Uncrossmatched Universal Donor PRBC units and equivalent amount of plasma available for issue until a blood type is confirmed. (If 2nd BB tech or MLT is available, maintenance of plasma and platelet ratios should be deferred to them.) |
| 6. | Assess inventory or resource needs if 2nd CLS or MLT is unavailable. See step 3 in section below. |
| 7. | Proceed with testing, utilizing the chart in Attachment A. Perform manual blood type, whenever possible. Continue to prepare 1:1 ratio of RBC/plasma using Type specific or compatible products after Blood type is confirmed. |
| 8. | Choose appropriate RBC order to result patient testing and take the following action in Sunquest:

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| If: | Then: |
| MTP activated before patient testing was started | * Use test ERUXM
* Cancel XM generated by the EPIC MTP order
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| MTP activated while testing was in progress or after crossmatched units are available | * Result patient testing on original TS/XM order
* Allocate units to XM order
* Hand enter patent results from XM into ERUXM grid. In cases where crossmatched units were available prior to MTP activation, revert to UNXM products is unable to keep up with demand.
* Cancel MTP XM order as duplicate
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| MTP was activated but units not needed prior to completion of crossmatch | * Use test XM generated by the EPIC MTP order
* Cancel test ERUXM
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| 9. | Assess blood product inventory and lab staff availability periodically throughout the event and reorder or call in support staff as needed. |
| 10. | Replenish blood supplies to the minimum inventory levels at the conclusion of the event.  |
| Procedure: 2nd CLS or MLT | MLT scope of practice is limited to allocation of non-RBC products. |
| Step | Action |
| 1. | Using “Issue of Uncrossmatched Blood” procedure, continue to have 6 units of “Uncrossmatched Universal Donor” RBCs available for issue until a blood type is confirmed.  |
| 2. | Assist primary BB tech with thawing FFP, maintaining a 1:1 ratio with issued PRBC, and allocating platelets. |
| 3. | Immediately assess the blood inventory level and lab staff on duty available to support the incident.• Universal Donor or Type Compatible: 30 RBCs, equivalent of 30 FFP, 20 units or 4 pools of Cryo and 3 PP 2 CLS and 1 Sr. LA dedicated to Transfusion Service

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| **If:** | **Then:** |
| Additional blood products are needed | Place STAT order |
| Additional lab staff needed , supervisor or lead tech on site | Notify supervisor or lead tech of staffing needs |
| Additional lab staff needed, no supervisor or lead tech on site | Assign front end staff to call in staff or page supervisor if unable to make calls. |

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| 4. | Issue blood according to “Issuing Blood during Massive Transfusion Protocol” procedure. |
| 5. | Once the blood type has been performed in duplicate on an acceptable specimen properly labeled for Transfusion Service testing, substitute type specific or type compatible uncrossmatched units until crossmatched units are available. |
| 6. | Assist the Transfusion Service tech as needed. |

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| Procedure: SLA or MLT |  |
| Step | Action |
| 1. |

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| If: | Then: |
| MTP is fist blood order received  | * Deliver 1st cooler of blood

products* If delay in availability of mobile storage device is anticipated, request that nursing unit help with arrangements for “runner” to pick up additional Coolers
 |
| MTP activated after 1st Cooler has been delivered or mobile storage device is ready | * Lab will deliver 1st mobile storage device of product to requesting location.
* Nursing unit will notify Blood Bank when products in mobile storage device are depleted.
* Pick up/delivery of subsequent mobile storage devices of product will be coordinated between nursing unit and Blood Bank
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| 2. | Issue blood according to “Issuing Blood during Massive Transfusion Protocol” procedure. |
| 3. | Return to laboratory and assist Transfusion Service tech as needed. |

Multiple Casualties will be handled in the following Manner:

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| Multiple Patients* Request physician to prioritize patients according to urgency of transfusion need
 | * Work up patients according to the priority established by physician
 | * Issue appropriate products to testing completed as specified in Attachment A
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| Multiple Patients * All Urgent Priority
 | * First, provide Uncrossmatched blood until able to begin testing
* Then, perform ABO/RH (in duplicate) on all patients.
* Then, perform antibody Screen on all patients.
* Last, perform crossmatches on all patients.
 | * Issue appropriate products to testing completed as specified in Attachment A
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| Related Documents | Uncrossmatched Blood PolicyProcessing and Issuing of Uncrossmatched bloodIssuing Blood During a Massive Transfusion Protocol |

Attachment A:

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| Testing Completed | Testing Priority | Products to be Issued |
| None* No Specimen drawn
 | * Draw STAT specimen for Type, Screen & Crossmatch
 | * O Universal Donor Uncrossmatched RBC
* Emergent Plasma
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| None* Specimen drawn
 | * ABO/RH
* Antibody Screen
* Crossmatch
 | * O Universal Donor Uncrossmatched RBC
* Emergent Plasma
 |
| ABO/RH (in duplicate) | * Antibody Screen
* Crossmatch
 | * ABO/RH compatible Uncrossmatched products
 |
| ABO/RH (in duplicate)Antibody Screen* Negative
 | * EXM/IS Crossmatch
 | * ABO/RH compatible Uncrossmatched products
 |
| ABO/RH (in duplicate)Antibody Screen* Negative

EXM/IS Crossmatch* Compatible
 | * Additional Crossmatches to keep 10 units ahead
 | * Type Specific or Type Compatible Crossmatched products
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| ABO/RH (in duplicate)Antibody Screen* Positive
 | * Antibody ID panel
* AHG Crossmatch units
* Call pathologist for consultation
* Notify physician
 | * If possible, postpone transfusion until antibody can be resolved.
* If transfusion cannot be postponed:
* Obtain Dr. consent to transfuse with unresolved antibody problem. Document on Request for Uncrossmatched Blood Form
* Recheck patient & donor ABO, issue ABO compatible UNXM units.
* Issue AHG compatible units if available.
* Issue least incompatible units, if all crossmatches are incompatible.
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