# Applicable Laboratory(s)):

North Carolina Baptist Hospital (NCBH)

Lexington Medical Center (LMC)

Davie Medical Center (DMC)

Wilkes Medical Center (WMC)

High Point Medical Center (HPMC)

Westchester

Clemmons

# Policy Purpose

When a delay in transfusion could be detrimental to the patient, blood may be issued without pre-transfusion restrictions. Patients who are massively transfused may have abbreviated testing. This protocol applies to all patients who require immediate transfusion and time does not permit routine testing and those that meet the definition of Massive transfusion.

# Scope

Procedure owner/Implementer: Blood Bank Management

Procedure prepared by: Julie Jackson

Who performs procedure: Department staff/management

# Definitions

1. Policy: As defined in the Policy on Creating and Amending Policy, a statement of principle that is developed for the purpose of guiding decisions and activities related to governance, administration, or management of care, treatment, services or other activities of WFBH.  A policy may help to ensure compliance with applicable laws and regulations, promote one or more of the missions of WFBH, contain guidelines for governance, and set parameters within which faculty, staff, students, visitors and others are expected to operate.
2. WFBH Lab System: Wake Forest Baptist Lab System is a health system that includes Wake Forest Baptist Medical Center and all affiliated organizations including Wake Forest University Health Sciences (WFUHS), North Carolina Baptist Hospital (NCBH), Lexington Medical Center (LMC), Davie Medical Center (DMC), Wilkes Medical Center (WMC), High Point Medical Center (HPMC), Lab at Westchester and Lab at Clemmons.
3. **Massive transfusion:** Transfusion or anticipated transfusion within a 24-hour period of a volume of blood approximating the recipient’s total blood volume.
4. **MTP:** Massive Transfusion Protocol- the protocol for non-obstetrical patients who need massive transfusion
5. **MOH:** Massive Obstetrical Hemorrhage- the massive transfusion protocol specific for obstetrical patients
6. **ED:** Emergency Department
7. **Emergency Release:** Blood that is obtained without pre-transfusion restrictions due to emergency situations.
8. **MRN:** Medical Record Number
9. **BBID:** Blood Bank Identification Band
10. **Obstetrical:** Relating to childbirth and the processes associated with it.
11. **ARC:** American Red Cross, supplies blood products

L. **LTOWB**: Low Titer Group O Whole Blood. This whole blood can be obtained from several

manufacturers. Routinely LTOWB has a titer less than 256. Leukoreduced LTOWB from ARC has a titer ≤200. LTO(neg)WB for pediatric use has a titer <50. If LTOWB is to be obtained from additional suppliers, management must review and approve the titer threshold set by the supplier.

# Sections

1. General Communication During Emergency
2. Activation of Trauma/ MTP Protocol
3. Activation of MOH Protocol
4. Mass Casualty Protocol
5. Selection of Blood Components
6. Whole Blood
7. Prepared Emergency Packs of Packed Cells and Plasma
8. Massive Transfusion Guidelines
9. Receipt of Patient Specimen for Testing
10. Clean-Up of Emergency Blood Release
11. Tracking Pediatric and Adult Massive Transfusion Protocol Patients

# Policy Guidelines

1. **Emergency Blood Protocols**
2. **General Communication During Emergency**
3. Always assume that any inquiry about a patient sample and/or product availability may be emergent even if the person asking is calm and offer blood on emergency release.
4. If activating MTP: Ask for age and sex of patient. If pediatric patient (<16 years old) ask if weight is ≥50kg (110 lbs).
   1. See section IV. Selection of Blood and Blood Compenents in MTP, MOH, Emergency Issue
5. If a sample is rejected from ED or a STAT order from ANY location, offer blood on emergency release.

a. Script Guidelines: ***“This specimen is not acceptable because (the reason) and needs to be recollected. Do you need blood on emergency release?”***

4.0 If a phone call is received from any area inquiring when blood will be available and testing is in Progress (testing not complete and/or antibody).

a. Script Guidelines: ***“The testing is not complete on this patient’s sample. Blood can be released on Emergency Release. Do you need blood on emergency release?”***

5.0 If anyone comes to the Blood Bank window inquiring when blood will be available and testing is in progress or sample has not been received.

a. Script Guidelines: ***“The testing is not complete and/or we do not have a current sample on this patient. Blood can be released on Emergency Release. Do you need blood on emergency release?”***

6.0 If provider or someone is calling for help to order blood/blood products on a patient,

a. Script Guidelines: ***“We are not trained in provider ordering blood products in Wake One. Blood/blood products can be released on Emergency Release. Do you need blood or blood product on emergency release?”***

7.0 If the response is yes to any of the possibilities (Steps 2-5), state ***– “Please send someone down to pick up the unit.”***

1. **Activation of Trauma/MTP Protocol**
2. Notification of Level I or Level II Trauma occurs via the Trauma Code Pager. The pager will sound and the message will indicate the Trauma Level.
   * 1. Level one traumas are the most serious and are more likely to require emergent blood; however both level one and level two tramas are considered STAT.

2.0 Notification of MTP may also come from floors (non Trauma).

*Refer to Attachment 2: ED Trauma Activation Manual*

3.0 Evaluation of blood bank staffing for the trauma call.

* 1. If it is determined by designated charge or staff that staffing is inadequate for the shift, notify management if more staff is needed.

1. Blood products are available in the Blood Fridge in the Emergency Departments (ED) for Adult and Peds and is maintained by Blood Bank once daily: once by first shift and as needed by other shifts when workload and staffing permits.
   1. See blood product inventory:

*Attachment 3: Blood Inventory in HemaEmerge Fridges*

*Refer to BB-SOP-0012: Emerge Fridges Daily Maintenance-ED and L&D*

1. Emergency Release Blood in BioFridge/coolers may be used if an MTP is initiated.
   1. The Adult ED refrigerator has low titer O pos whole blood, O pos and O neg packed red cells and A liquid plasma available
   2. The Pediatric ED refrigerator has ultra low titer O negative whole blood, O negative packed cells and AB thawed plasma
   3. BioFridge carts are preferable to credo/OR coolers for MTPs when issued from Blood Bank.
   4. The BioFridge will contain up to 2 rounds of an MTP.
   5. Only uncrossmatched emergency blood will be placed in the BioFridge
      1. Exceptions include planned cases approved by management expected to take large quantities of blood. (Example: planned MOH, TAAA cases). In these circumstances, crossmatched type specific tagged products can be issued in biofridges with appropriate signage.

*Refer to BB-SOP-0056: Blood and Blood Product Issue*

*Refer to BB-SOP-0049: FD: Blood Cooler Issue*

*Refer to BB-POL-0027: Blood Cooler Protocol*

*Refer to Policy: Policy for Pediatric and Adult Clinical Massive Transfusion*

1. Epic MTP Protocol Order
   1. A MTP may start with up to 4 units of whole blood (or packed cells and plasma) from the ED Emerge fridge.
2. MTP order needs to be placed in Epic
3. Once the order is signed the product orders will automatically cross to SCC.
   1. MTP order includes:
4. Whole Blood order for 4 units
5. Crossmatch order for 4 units of RBC
6. Prepare order for 4 units of plasma
7. Prepare order for 1 unit of platelets
8. Emergency Release form
9. Type and screen
10. Transfusion order for 4 units of WB (for nursing)
11. transfusion order for 4 units of RBC (for nursing)
12. transfusion order for 4 units of plasma (for nursing)
13. transfusion order for 1 unit of platelets (for nursing)
    1. Units can be added to an in dated blood specimen for type and screen
       1. An emergency release form will need to be initiated if
          1. Testing is not completed
          2. An antibody is present (no time to do AHG crossmatch)
          3. Other special requirements cannot be met due to the emergent situation (i.e. irradiation needed, XMIS needed, etc…)
14. **Activation of MOH Protocol**
15. Notification of MOH activation occurs via the MOH Pager. The pager will sound and the message will indicate the MOH.
16. Blood is available in the Blood Fridge in Labor and Delivery and is maintained once daily by blood bank first shift:
    1. *Attachment 3: Blood Inventory in HemaEmerge Fridges*

*Refer to BB-SOP-0012: Emerge Fridges Daily Maintenance-ED and L&D*

1. Emergency Release Blood in BioFridge/coolers may be requested when the patient is in Labor and Delivery or when a MOH is initiated.
   1. Red cells are available to be taken from the L&D Blood Track Emerge refrigerator as needed.
   2. BioFridge carts are preferable to credo/OR coolers for MOHs
   3. Liquid plasma is not approved for MOH patients. Use Thawed plasma only.
   4. The BioFridge will contain 2 rounds of an MOH:
   5. Only uncrossmatched emergency blood can be used in the BioFridge; Type specific crossmatched product must go out in coolers.
      1. **L&D fridge:** RBCs available if needed until Biofridge arrives

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Biofridge** | **Round** | **RBCs** | **Plasma\*** | **Plateletpheresis** | **Cryoprecipitate** | **Comments** |
| **1st Biofridge** | **Round 1:** | 4 RBCs | 4 thawed plasma | 1 Plt |  |  |
| **Round 2:** | 4 RBCs | 4 thawed plasma\* | 1 Plt | 5 pack cryo\*\* | Start thawing 4 more plasma\* and cryo\*\* |
| **2nd Biofridge** | **Round 3:** | 4 RBCs | 4 thawed plasma\* | 1 Plt |  |  |
| **Round 4:** | 4 RBCs | 4 thawed plasma\* | 1 Plt | 5 pack cryo\*\* |  |

**\*NOTE: 4 thawed A plasmas are kept routinely in the Blood Bank for MOHs. If 8 thawed plasma are not available the initial biofridge may only contain 4. Once the initial 4 are given in the 1st BioFridge automatically thaw 4 more for the 2nd and future rounds as needed.**

**\*\*NOTE: Start thawing cryo or use pre-thawed IFC**

**Missing products: communicate to the patient’s care team and follow up when product is ready.**

*Refer to BB-SOP-0056: Blood and Blood Product Issue*

*Refer to BB-SOP-0049: FD: Blood Cooler Issue*

*Refer to BB-POL-0027: Blood Cooler Protocol*

*Refer to BB-SOP-0018: BioFridge Operation*

1. EPIC MOH Protocol Orders need to be placed in Epic. There are multiple rounds that are to be ordered as needed. Below is the list of products and orders that go with each of the MOH Protocol round:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **MOH ORDERS IN EPIC** | | | | | | |
| **MOH**  **ROUND:** | **TSX** | **RBC** | **PLASMA** | **PLT** | **CRYO** | **TRANSFUSION ORDERS** |
| **1** | 1 | 4 | 4 | 1 |  | YES |
| **2** |  | 4 | 4 | 1 | 1 | YES |
| **3** |  | 4 | 4 | 1 |  | YES |
| **4** |  | 4 | 4 | 1 | 1 | YES |
| **5** |  | 4 | 4 | 1 |  | YES |
| **6** |  | 4 | 4 | 1 | 1 | YES |

* 1. Units can be added to an in dated type and screen specimen.
     1. An emergency release form will need to be initiated if
        1. Testing is not completed
        2. An antibody is present (no time to do AHG crossmatch)
        3. Other special requirements cannot be met due to the emergent situation (i.e. irradiation needed, XMIS needed, etc…)

1. **Mass Casualty Protocol**
2. Management of Blood and Blood Products will be ongoing if the mass casualty plan is initiated.
3. The Blood Bank Manager or designee will closely monitor the impact of the event on blood utilization during the course of the event and keep Lab Administration and the Incident Command Center informed.
4. At the initial activation of the Phase 3 Medical Surge Plan, the Blood Bank will respond in accordance with their current policy on Emergency Blood Management.
   1. The emergency MTP Packs at the Winston Salem ARC Blood Center should be requested.
   2. Blood products may be requested in the prehospital setting to support the resuscitation efforts of first responders.
      1. 10-20 Group O WB or red cells will be packed into a shipping box (example ARC box) with wet ice, 20 Emergency Release forms, and 20 slap bracelets. First responders will alert Blood Bank of the needed quantity of units.

Refer to BB-POL-0086: Mass Casualty Pre-Hosptial Blood for Trained First Responders

A white rectangular object with a red ribbon

Description automatically generated

* + 1. Each unit will have a safe-t-view attached for temperature monitoring.
    2. All units will be documented on a downtime issue form for BB records.
    3. The box can be sent with a trained first responder crew (AirCare, or local EMS agency) to the scene of the mass casualty event. If a non-trained facility wishes to pick up product, obtain medical director or management approval.
    4. Trained first responders are responsible for tracing units to patients and notifying blood bank.
       1. Slap bracelet with patient ID and units received will be returned with signed Emergency Release form to Blood Bank.
       2. Empty blood bags with patient ID will also be returned to Blood Bank.
    5. Blood Bank Management will evaluate inventory and subsequent shipments of trauma blood to the mass casualty scene as needed.

1. The Blood Bank Manager or designee will continue to evaluate inventory and call blood suppliers to restock if necessary.
2. On site staffing levels will be assessed and if necessary the Emergency Call Tree for Blood Bank will be initiated and additional staff will be called in to assist.
3. During a disaster, the Blood Bank will handle the needs of the hospital as long as the supply of blood and blood products remains available from suppliers. If supplies become an issue, a decision as to how to proceed further will be collectively made by the command staff.
4. **Selection of Blood Components**
5. **Selection of Blood and Blood Components in MTP, MOH, Emergency Issue**
   1. Low volume red cell units (E5242) are acceptable for use in Trauma / MTP situations.

**FOR ALL SCENARIOS: IF PLATELETS MEETING STATED CRITERIA ARE NOT AVAILABLE, CHOOSE GROUP A FOLLOWED BY ANY GROUP**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **MALE or FEMALE ≥16yr** | **WB** | **RBC** | **LIQUID PLASMA** | **PLASMA** | **PLATELET** | **CRYO** |
| **O POS** | **O POS** | **A** | **A** | **ANY ABO/RH** | **ANY ABO/RH** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **AGE / SEX UNKNOWN**  **in ADULT ED** | **WB** | **RBC** | **LIQUID PLASMA** | **PLASMA** | **PLATELET** | **CRYO** |
| **O POS** | **O POS** | **A** | **A** | **ANY ABO** | **ANY ABO/RH** |
| **MOH** | **DO NOT GIVE** | **O NEG** | **DO NOT GIVE** | **A** | **ANY ABO**  **RH NEG** | **ANY ABO/RH** |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **MALE**  **“ADULT”**  **PEDS**  <16yr ≥50kg/110lb | **Ask**  **for**  **WEIGHT!** | **WB** | **RBC** | **LIQUID PLASMA** | **PLASMA** | **PLATELET** | **CRYO** |
| **O POS** | **O POS** | **A**  if in Adult ED  **AB/A**  if in PEDS ED | **A**  if in Adult ED  **AB/A**  if in PEDS ED | **ANY ABO/RH** | **ANY ABO/RH** |
| Use A Plasma if AB not available | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **FEMALE**  **“ADULT”**  **PEDS**  <16yr ≥50kg/110lb | **Ask**  **for**  **WEIGHT!** | **WB** | **RBC** | **LIQUID PLASMA** | **PLASMA** | **PLATELET** | **CRYO** |
| **O NEG** | **O NEG** | **A**  if in Adult ED  **AB/A**  if in PEDS ED | **A**  if in Adult ED  **AB/A**  if in PEDS ED | **ANY ABO**  **RH NEG** | **ANY ABO/RH** |
| Use A Plasma if AB not available | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **PEDIATRIC**  4m + 1day – 15yr  <50kg  **OR**  **AGE / SEX UNKNOWN**  **in PEDS ED** | **WB** | **RBC** | **LIQUID PLASMA** | **PLASMA** | **PLATELET** | **CRYO** |
| ULTRA LOW TITER  **O NEG\***  ≥ 1 year | **O NEG** | **DO NOT GIVE** | **AB** | **AB NEG** | **ANY ABO/RH** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **NEONATE**  **≤4m** | **WB** | **RBC** | **LIQUID PLASMA** | **PLASMA** | **PLATELET** | **CRYO** |
| **DO NOT GIVE** | **O NEG** | **DO NOT GIVE** | **AB FFP** | **AB NEG** | **AB** |
| Irradiation NOT required for ER / MTP Notify Medical Director if incompatible PLTS are given  Consult with Pathologist on call if CRYO meeting criteria is not available | | | | | |

**MISSING PRODUCTS: Communicate to the patient’s care team and follow up when product is ready.**

**ONLY UNCROSSMATCHED EMERGENCY PRODUCTS SHOULD BE ISSUED IN BIOFRIDGES**

\*O Neg Ultra Low Titer WB is preferable but O Pos LTOWB can be used if O neg unavailable.

Selection of Blood and Blood Components in MTP, MOH, Emergency Issue **WHEN ABO/Rh is KNOWN**

* **Current type and screen must be available**
* **When group specific blood is issued (needs approval by mgmt./medical director), the units must be tagged per SOP and pickup person must have an issue slip or equivalent with patient’s name/MRN**
* **Revert to ABO/Rh unknown protocol if time does not permit tagging units or type specific products are not available**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **MALE or FEMALE ≥16yr** | | **WB** | **RBC** | **LIQUID PLASMA** | **PLASMA** | **PLATELET** | **CRYO** |
| **O POS** | **ABO/Rh compatible** | **A** | **ABO compatible** | **ANY ABO/RH** | **ANY ABO/RH** |
| **UNKNOWN**  **in ADULT ED** | | **WB** | **RBC** | **LIQUID PLASMA** | **PLASMA** | **PLATELET** | **CRYO** |
| **O Rh compatible** | **ABO/Rh compatible** | **A** | **ABO compatible** | **ANY ABO**  **RH compatible** | **ANY ABO/RH** |
| **MOH** | | **DO NOT GIVE** | **ABO/Rh compatible** | **DO NOT GIVE** | **ABO compatible** | **ANY ABO**  **RH compatible** | **ANY ABO/RH** |
| **MALE**  **“ADULT”**  **PEDS**  <16yr ≥50kg/110lb | **Ask**  **for**  **WEIGHT!** | **WB** | **RBC** | **LIQUID PLASMA** | **PLASMA** | **PLATELET** | **CRYO** |
| **O POS/NEG** | **ABO/Rh compatible** | **A**  if in Adult ED  **AB/A**  if in PEDS ED | **ABO compatible** | **ANY ABO/RH** | **ANY ABO/RH** |
| **FEMALE**  **“ADULT”**  **PEDS**  <16yr ≥50kg/110lb | **Ask**  **for**  **WEIGHT!** | **WB** | **RBC** | **LIQUID PLASMA** | **PLASMA** | **PLATELET** | **CRYO** |
| **O Rh compatible** | **ABO/Rh compatible** | **A**  if in Adult ED  **AB/A**  if in PEDS ED | **ABO compatible** | **ANY ABO**  **RH compatible** | **ANY ABO/RH** |
| **PEDIATRIC**  4m + 1day – 15yr  <50kg  **OR**  **AGE / SEX UNKNOWN**  **in PEDS ED** | | **WB** | **RBC** | **LIQUID PLASMA** | **PLASMA** | **PLATELET** | **CRYO** |
| ULTRA LOW TITER  **O NEG\***  ≥ 1 year | **ABO/Rh compatible** | **DO NOT GIVE** | **ABO compatible** | **ABO/Rh compatible** | **ANY ABO/RH** |
| **NEONATE**  **≤4m** | | **WB** | **RBC** | **LIQUID PLASMA** | **PLASMA** | **PLATELET** | **CRYO** |
| **DO NOT GIVE** | **O Rh compatible** | **DO NOT GIVE** | **AB FFP** | **ABO/Rh compatible** | **ABO compatible** |
| **Irradiation NOT required for ER / MTP Notify Medical Director if incompatible PLTS are given**  **Consult with Pathologist on call if CRYO meeting criteria is not available** | | | | | |

**MISSING PRODUCTS: Communicate to the patient’s care team and follow up when product is ready.**

\*O Neg Ultra Low Titer WB is preferable but O Pos LTOWB can be used if O neg unavailable.

1. For the list of stock that is available in the Blood Fridge in the Emergency Department (ED) see *Attachment 2: ED Blood Inventory in HemaEmerge Fridges in Adult and Peds* 
   1. The ED Blood Fridges are checked and restocked daily by first shift and as needed by other shifts when workload and staffing permits.

*Refer to BB-SOP-0012: Emerge Fridges Daily Maintenance-ED and L&D*

1. If ABO/Rh has been tested on a CURRENT sample, then Group and type specific red cells or compatible may be issued ONLY with management/medical director approval if active MTP.
   1. **When group specific blood is issued, the units must be tagged with patient identification.**
   2. Units will be packed in coolers, not biofridges**.**
   3. The pickup person must have an issue slip or equivalent with patient’s name and MRN number.
   4. Units should be verified by read back procedures as per SOP
   5. It is preferable to continue to give patient Group O RBC products. Notify management immediately if inventory levels cannot support this process. Switching to types specific product will only be approved if mgmt./medical director can ensure the safety of the patient.
2. Reliance on previous records is not acceptable. There must be a current sample to issue Group and Type specific or compatible.
3. Other products (plasma/platelets/cryo/red cells) are to be prepared STAT as requested.
4. Verbal requests for additional packed red cells and other blood products may be recorded on the Blood Bank-Verbal/Add-on Order Form.
   1. Document as much of the following information as possible and record on the form:
5. Date/Time Order Received
6. Tech taking verbal order
7. Location
8. Ordered by
9. Number ordered of each product
10. Age and Gender for Trauma
    1. Read back the information received to confirm verbal order.

1. Inventory shall be monitored when blood products are being used rapidly. The blood supplier shall be called to request additional supply.
   1. If they are unable to send units and/or there is insufficient time to receive and process the units, switch the patient to Rh positive units.
   2. If continuing transfusion requirement is expected to exceed the available supply of Rh negative units, evaluation of the change should be made to conserve blood for other recipients.
   3. If continuing transfusion requirement of packed cells is expected to exceed the available supply of group B or A, evaluate the situation to determine if patient needs to be changed to group O.
   4. If the patient is a pediatric patient, contact management/Pathology resident/on call or Medical Director.
2. Rh-negative adult males or females may be switched to Rh positive after six (6) packed cells have been Issued.
   1. The Medical Director should be notified if the patient has anti-D and/or is a female of child- bearing age (females < 51 yrs old).
3. Group AB patients may be transfused with group AB, B, A, or O packed red cells.

*Refer to BB-POL-0052: Selection of Blood and Blood Components*

1. When patients have been transfused with blood of an ABO group other than their own (ex. Group O to group A or B) and additional transfusions are needed, it is desirable to return to the patient’s own ABO group.
   1. The safety of the conversion depends on the status of anti-A and/or anti-B in the current sample.
   2. An AHG crossmatch can be used to determine compatibility if unexpected anti-A and/or anti-B is present in the recipient’s current sample.
   3. If incompatible, continue transfusion with blood that lacks the corresponding antigen.

(Ex. group O)

1. **Whole Blood**
2. Low Titer Group O Whole Blood (LTOWB) will be received on a weekly standing order.
3. Leukoreduced LTOWB has been tested to ensure that the titer is ≤ 200
4. LTOWB that is NOT leukoreduced will have a ‘NOT LEUKOREDUCED’ sticker placed on each unit when it is received into inventory.

3.1 Non-leukoreduced LTOWB has been tested to ensure that the titer is <256.

1. Whole Blood will be placed in the Adult ED Fridge for use as the initial round of blood products when MTP is activated when indicated by patient’s age, sex and clinical status.
2. Issuing Whole Blood to Adult patients: (≥ 16 years OR ≥50kg/110 lbs.)
   1. When patient ABO/Rh is unknown,
3. Up to one hundred (100) Group O whole blood units can be transfused during MTP.
4. For males AND females 16 years and older

(Afterwards, switch to group O red cells.)

1. The first round of MTP for trauma patients who ≥ 16 years or ≥ 50kg shall be 4 WB. If WB is unavailable revert to providing components.
   1. There are no plasma or platelets issued in the round with group O whole blood.
   2. All other MTP rounds should be either 4 WB, or 4 red cells, 4 plasmas, and 1 platelet apheresis (or whatever the provider orders).
   3. **Group O patients may receive as many Group O whole blood as needed.**
2. Sufficient inventory of group O whole blood should remain in Blood Bank to provide for ED, Air Care and EMS coolers.
   1. Blood Bank may dispense whole blood to surgery and other acute units upon request if there is whole blood available in the Blood Bank.
3. Ultra low titer Group O negative whole blood
   1. Ultra low titer Group O negative whole blood has been tested to ensure that titer is <50.
   2. Ultra low titer O negative WB is available in the pediatric ED.
   3. While Group O negative ultra-low titer whole blood is first choice for pediatric trauma patients, Group O pos LTOWB is acceptable, should the inventory of O negative WB be exhausted.
   4. *Refer to BB-SOP-0125: Titration and Use of Whole Blood for Use by the Pediatric ED* for O negative WB use guidelines.
   5. The maximum number of WB allowed per pediatric patient is weight calculated. Blood bank will likely not have access to this data. It is important to understand that the physician my request components on pediatric patients b/c the max limit of WB has been reached. When components are requested, fill the order as requested.
4. Whole Blood packing
   1. Remove whole blood units from remote fridges and AirCare/EMS units when at least 2 days left on unit.
   2. Position whole blood in blood bank upright on the Whole Blood shelf for a minimum of 24 hours to settle the red cells and then proceed to prepare packed cells.
   3. The plasma removed from the Whole Blood unit will be discarded physically.
   4. If needed, the whole blood can be centrifuged in the BMT floor centrifuge at 4 C° to accelerate the separation of plasma and red cell.

*Refer to BB-SOP-0046: CP Packing Whole Blood*

1. **Prepared Emergency Packs of Packed Cells and Plasma**
2. **RBC:** There are four (4) units of O positive packed cells and four (4) units of O negative packed cells available on the Trauma Shelf with paperwork documenting units in each pack.
   1. These units are labeled with an **‘Uncrossmatched Blood’** sticker.
   2. The unit numbers, E codes and ABO/Rh are recorded on the Emergency/Downtime Sign-Out Log.
   3. Segments are not pulled for these units. If a segment is needed later, it can be obtained in the bag on the date the unit was processed located in the Sera refrigerator.
   4. A blank Emergency Release form is with each set.
   5. There are two sets of two (2) O pos and one set of two (2) O neg RBC units available for non-MTP emergency release.
3. **Plasma:** A minimum of twelve (12) Group A plasmas, and one (1) Group AB thawed plasma are to be available in refrigerator #9 with a copy of the ISBT label rubber banded to each unit.
4. The Group A plasmas are to be used and placed in the Biofridges **at issue**.
   1. MTP: liquid plasma or thawed plasma
   2. MOH: thawed plasma only
   3. Liquid plasma is for MTP/trauma use only.
5. The Group AB plasma is for pediatric emergency.
   1. Thawed AB for emergency use should be thawed from AB FFP
   2. If AB FFP is not available, Thawed AB FP24 is acceptable
   3. Initial round of MTP for pediatric patient ≥ 50kg should include 4 WB or 4 AB/A liquid plasma, 4 red cells, and 1 platelet.
   4. Initial round of MTP for pediatric patient < 50kg should consist of (1) group AB thawed plasma, 4 red cells and 1 platelet. (Ultra-low titer O neg WB and an additional AB thawed plasma is available in the Peds ED.)
   5. Continuation of all pediatric MTPs should be supported with thawed AB FP24 conserving AB FFP until blood type is known.

(FP24 can be substituted for FFP during shortages)

1. Ideally the 12 A plasmas would include 4 thawed plasma + 8 liquid plasma
   1. 4 Thawed plasmas are used for MOHs (these 4 are part of the regular thawed plasma inventory)
   2. 8 or more liquid plasmas for MTPs
      1. If the liquid plasma level drops below 4, thaw A plasma to keep the total inventory at 8 or more.
      2. Use thawed plasma if there are short dated thawed plasmas in danger of expiring on shelf.
   3. Keep 4 or more AB liquid plasmas for “adult” pediatric MTPs
      1. If no AB liquid plasma is available, thaw 2 additional AB plasma to keep total inventory at 4.
2. A Xerox copy of each Trauma plasma should be made and placed with the unit if stored in the refrigerator OR in the folder located on top of each BioFridge unit.
3. In the event that the Xerox or ISBT printer is not working, the unit numbers, E codes and ABO/Rh can be recorded on the Emergency/Downtime Sign-Out Log.
4. Whole blood/Packed Cells and Plasma/liquid plasma units should be restocked as time permits.
5. **Release of blood MUST NOT be DELAYED due to a lack of information. Group O low titer whole blood or Group O packed cells may be released without any information. The location of the units is needed for clean-up procedure in Blood Bank.**
6. IF available **AND** time permits, the patient’s name or unique identifying number, approximate age, sex, and weight can be recorded on the: Emergency Release of Blood, Emergency Downtime Sign-out and BB Requisition.
   * 1. This paperwork should be contained within a folder on the processing area.
7. Label packed cell units with an “Uncrossmatched Blood” sticker.
8. The units may be placed into a BioFridge/cooler with the emergency release on top.

*Refer to BB-SOP-0049: Blood Cooler Issue*

1. Write patient name and identifying number on a separate piece of tape and attach to the top of the cooler. **If no** **name/number, write Emergency Release-no name/number on top of cooler.**
2. Release BioFridge/cooler or units to location. If request received by phone and no one arrived at Blood Bank, then the location that made the request should be called.
3. IF possible and does NOT delay release, obtain the name of the physician attending the patient or the location the blood is going and record on one of the downtime forms and on the Emergency Release.
4. The physician or nurse needs to be informed of the need to sign and return the form.
5. Remind whoever picks the blood up that a specimen is needed as soon as possible.
6. Additional BioFridge/coolers should be prepared as needed.

*Refer to BB-SOP-0018: BioFridge Operation*

1. Information can be entered into computer when time permits.
2. When the name is known, cross-reference on all forms.
3. Continue to evaluate inventory and call blood supplier to restock if necessary.
4. **Massive Transfusion Guidelines**
5. Massive transfusion is defined as the transfusion or anticipated transfusion within a 24-hour period of a volume of blood approximating the recipient’s total blood volume.
6. Following massive transfusion, the pretransfusion sample no longer represents the blood currently in the patient’s circulation and has limited benefit.
7. Crossmatch testing (electronic or immediate spin crossmatch or AHG crossmatch) is not necessary when blood is being issued emergently with an emergency release form prior to the completion of the antibody screen and crossmatch.
   1. Sunquest is setup to detect ABO incompatibility. Sunquest will only allow emergency issue of certain ABORh to patients without a current ABORh.

These are not hard stops. QA Warnings must be answered appropriately (example: MTP) when issuing Rh pos red cells, etc.

1. Patient testing (antibody screen and/or crossmatch) is completed for units once the patient is stable providing a sample is available in the Blood Bank.
2. If the antibody screen is positive or the patient has a history of a clinically significant alloantibody:
   1. The decision of selecting antigen-negative units for transfusion will depend on the specific alloantibody and the urgency of transfusion because following massive transfusion the proportion of the patient’s own cells and plasma in the circulation decreases and the pretranfusion specimen ceases to represent the patient’s current status.
3. The patient’s physician must be notified of the availability and time factor involved to provide antigen negative units and will be responsible for the transfusion decision. This should be documented on the BB requisition or equivalent.
4. An emergency release form is required if antigen positive or unscreened units must be issued and/or the antibody has not been identified.
5. If the patient has an antibody with less than 50% chance of finding compatible blood, antigen negative units should be conserved for transfusion after the active bleeding episode. Consult with medical director, management or pathologist on call.

*Refer to Policy for Pediatric and Adult Clinical Massive Transfusion*

1. **Receipt of Patient Specimen for Testing**
2. The sample must be labeled properly.

1.1 If sample is not labeled correctly, continue to issue group O RBCs and request a redraw.

*Refer to BB-SOP-0053: Specimen Labeling Requirements and BBID Numbers*

1. The ABO/Rh and confirmatory ABO/Rh should be performed.

*Refer to BB-POL-0074: Second ABO for No History Patients*

1. Patients whose ABO group has not been confirmed shall receive group O red cells or low-titer group O whole blood.
2. The antibody screen shall be performed STAT

4.1 If any clinically significant antibody is detected notify the medical director (path on call) immediately if antigen positive blood has been issued (example: O pos WB to patient with Anti-D). If anti-D is identified switch patient to Rh negative red cell products immediately. For other clinically significant antibodies, refer to section VIII, 5-8 above.

1. Once the ABO/Rh has been confirmed, Group Specific red cells may be allocated ONLY if approved by management (Refer to Section V, 3.0).

*Refer to BB-POL-0074: Second ABO for No History Patients*

* 1. Plasma: Ensure plasma compatibility. If possible, continue to give Group A plasma during the MTP/MOH to conserve other groups of plasma.
* If patient is B, and B red cells are issued do NOT give A plasma. If A plasma must be issued continue to give O red cells.
  1. Give Group specific plasma once the MTP/MOH is over.

1. If approved for group specific: Four units of Group Specific packed cells should be tagged with the Transfusion Tags and patient information (Patient Full Name/Medical Record Number when time permits. The minimal information is Medical Record Number for non Group O packed cells).
2. Pack the units per procedure into a Cooler (not a biofridge).

*Refer to BB-SOP-0056: FD Blood and Blood Product Issue*

1. The patient location should be called and notified that group specific is now available.
2. The name of the physician who is being informed that group specific is available shall be documented.
3. If approved, The BioFridge/cooler of Group O red cells may be switched out with a cooler of group specific product.
   1. Plasma: Ensure plasma compatibility. If possible, continue to give Group A plasma during the MTP/MOH to conserve other groups of plasma.

* If patient is B, and B red cells are issued do NOT give A plasma. If A plasma must be issued continue to give O red cells.

**X. “Clean-Up” of Paperwork**

1. The Trauma patient verification shall be obtained from ED or medical records.
2. The name and MRN shall be recorded on all forms when verified.
3. The files shall be checked for previous record once the patient name is known.
4. All tests shall be ordered and resulted in computer.
5. Clean UP should be done in “batches”, i.e., ‘Emergency Issue’ all units that were issued in the first Cooler in Sunquest, then ‘Emergency Issue’ units from second cooler etc.
6. Units should be crossmatched according to the Massive Transfusion Protocol.
7. Crossmatch testing (electronic or immediate spin crossmatch or AHG crossmatch) is not necessary when blood is being issued emergently with an emergency release form. Refer to MTP protocol Section VIII. 3.0.

9.0 All products should be ‘Emergency issued’ even if they have been returned.

10.0 Returned blood and products need to have the Sunquest reason codes added in Sunquest and completed for all returned products.

MTPOK – means unit is acceptable to go back to inventory.

11.0 Check the Emergency Release of Blood Form for physician signature.

11.1 Place the Emergency Release of Blood Form in the Emergency Release box

at Front Desk and place the original Trauma request to the BB Requisition in

box at Front Desk.

* 1. The completed Emergency/Downtime Sign-out Sheet are placed in the tray

labeled ‘worksheets’ at the Front Desk.

12.0 If the patient expires and no sample was received, place a “Emergency Red Blood Cell” (etc.) order in Epic.

12.1 The units can then be ‘Emergency Issued’ in Sunquest.

12.2 An immediate spin crossmatch will be pending in Sunquest. This test should not be cancelled unless the patient expires with no sample sent to lab.

**XI. Tracking Massively Transfused Patients (MTP and MOH)**

1. When a MTP or MOH is activated, the following information is obtained:
   1. Record the Date the phone call was received
   2. The patient's name or unknown designation
   3. Medical Record Number
   4. Record the time the phone call was received
   5. Any comments add to this column
   6. Document if Blood Bank was notified that the MTP/MOH was over
2. Record the information electronically on the Massive Transfusion Log.
3. The form should be sent to the management electronically at the end of the month and this task should be checked off of the Quarterly QC form.
4. A new log should be created at the beginning of each month.
5. The medical director and management review the form monthly.
6. After review, the form is electronically sent to:
   1. Karen Parker, Performance Improvement Coordinator, Trauma Services.
   2. Cynthia Mastropieri, RN Manager Trauma
   3. Charlene Kramer, RN Manager Pediatric Trauma
   4. Emmanuel Fadeyi, MD Blood Bank Medical Director
   5. Markie Beiland, RN Trauma Coordinator
   6. Nicole (Holly) Reavis, Clinical Quality Compliance Consultant
   7. Carolyn Gray Foley, Nurse Trauma Registrar
   8. Bobbi Jo Tutterow, RN Transfusion Safety Coordinator
7. This information is used by the Trauma Committee

# Literature References:

AABB Technical Manual, revised periodically

AABB Standards for Blood Banks and Transfusion Services, revised periodically

Raval, J. et al. *Anti-D alloimmunization in Rh(D) negative adults with severe traumatic injury*. Transfusion. DOI: 10.1111/trf.16493

Yazer, et al. *It is time to reconsider the risks of transfusing RhD negative females of childbearing*

*potential with RhD positive red blood cells in bleeding emergencies*. Transfusion. 2019; 59; 3794-

3799.

**RELATED POLICIES/PROCEDURES IN NAVEX:**

Policy: Policy for Pediatric and Adult Clinical Massive Transfusion

**ATTACHMENTS/LINKED DOCUMENTS IN TITLE 21:**

Attachment 1: Selection of Blood and Blood Type in MTP

Attachment 2: ED Trauma Activation Manual

Attachment 3: Emerge Inventory Levels

Attachment 4: Massive Obstetrics Hemorrhage Transfusion Protocol (MOH) (internet policy)

Attachment 5: Pediatric and Adult Clinical Massive Transfusion (internet policy)

BB-SOP-0056: FD Blood and Blood Product Issue

BB-POL-0074: Second ABO for No History Patients

BB-SOP-0053: Specimen Labeling Requirements and BBID Numbers

BB-SOP-0018: BioFridge Operation

BB-SOP-0049: Blood Cooler Issue

BB-SOP-0046: CP Packing Whole Blood

BB-SOP-0125: Titration and Use of Whole Blood for Use by the Pediatric ED

BB-POL-0052: Selection of Blood and Blood Components

BB-SOP-0012: Emerge Fridges Daily Maintenance-ED and L&D

BB-POL-0027: Blood Cooler Protocol

BB-POL-0047: Pregnancy Protocols

# Revision Dates: Review Change Summary as represented in Title 21.

**Attachment 1**

**Selection of Blood and Blood Type in MTP**

|  |  |  |
| --- | --- | --- |
| **Patient** | **Blood/Blood Products** | **Ages** |
| **TRAUMA** | **Whole Blood 1: O POS** | **Males AND Females :**   * **16 years and older** * **Pediatric ≥ 50kg. in Adult ED** * **Unknown age/sex in Adult ED** |
| **Ultra low titer Whole Blood : O Neg (available in Peds ED)**  **O pos LTOWB if O neg not available** | **≥ 1 years** |
| **EMERGENCY** | **Red Cells: O POS**  **Plasma: Group A**  **Any platelets** | **Males AND Females :**   * **16 years and older** * **Pediatric ≥ 50kg. in Adult ED** * **Unknown age/sex in Adult ED** |
| **Red Cells: O NEG**  **Plasma: Group AB 2 (4 months+1 day to 15 years)**  **Plasma: Group A (16 years and older)**  **Platelets:**  **1st choice: AB/Group Specific/Compatible**  **2nd choice: Group A**  **3rd choice: Any** | **Males and Females :**  **4 months + 1 day to 16 years**  **Unknown Sex and/or age (any location other than Adult ED)** |
| **Red Cells: O NEG**  **Plasma: Group AB Thawed FFP**  **Platelets:**  **1st choice: AB NEG/or Group**  **Specific/Compatible platelets**  **2nd choice: A NEG**  **3rd choice: ANY**  ***Notify medical director if ABO incompatible platelets had to be given.*** | **NEONATES - birth up to and including 4 months old** |

.1If whole blood units available. If not available, Group O RBC units will be issued.

2 **Pediatrics ≥ 50 kg can receive AB liquid plasma.** **Neonates, pediatrics < 50kg and MOH patients should not receive liquid plasma**

**Attachment 3**

**Optimal Emerge Inventory Levels**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Emerge location** | **Whole Blood** | **Red cells** | | **Plasma** | |
| **O pos** | **O neg** | **A**  **(thawed or liquid)** | **AB**  **(thawed FFP)** |
| **Adult ED** | **10** | **4** | **4** | **4** |  |
| **Peds ED** | **2** |  | **2** |  | **1** |
| **Labor & Delivery** |  |  | **4** |  |  |