

# **Trauma Center Practice Management Guideline**

*UnityPoint Health Des Moines*

<b><i>Massive Transfusion Management Guideline –</i></b>	
<b>ADULT &amp; PEDIATRICS</b> <b>Practice Management Guideline</b>	<b>Effective: 06/2014</b>
<b>Contact: Trauma Medical Director</b>	<b>Reviewed: 10/2025</b>

## **PURPOSE**

This procedure provides instructions for obtaining blood and/or components for patients who have a massive bleed or have been massively transfused.

## **DEFINITION**

Massive transfusion is defined as the acute administration approximating or exceeding the patient's blood volume (8-10 units of blood for average sized adult) within a 24-hour interval. Massive transfusion protocol is available for patients experiencing life-threatening bleeding with actual or anticipated losses due to trauma, surgery, medical/obstetric disorders, or congenital/acquired coagulopathy.

## **POLICY STATEMENT**

The policy applies to all patients who, in the opinion of the physician, have an emergent need for large amounts of blood and blood products in order to maintain oxygen carrying capacity and hemostasis.

1. Triggers for initiating Massive Transfusion
  - A. Assessment of Blood Consumption (ABC) score of two or more (four variables, each assigned one point):
    - HR > 120
    - SBP < 90
    - + FAST
    - Penetrating torso injury
  - B. Persistent hemodynamic instability
  - C. Active bleeding requiring operation or embolization
2. In an emergency, the patient's physician must weigh the risk of transfusing uncrossmatched red blood cells against the hazard of waiting for completed compatibility tests.
  - A. If the urgency of the situation warrants the release of red blood cells before the cross match is completed, the physician must accept the responsibility for any complications caused by an antigen-antibody reaction that would have been detected by compatibility testing. Such a release does not absolve the Blood Bank from its responsibility to issue properly grouped and labeled blood.
3. The Massive Transfusion Protocol may be initiated in any patient care area.
  - A. Immediately following the administration of the blood/blood products, the physician will make an assessment as to the most appropriate area in which to continue care and management of the patient. (i.e. to keep the patient in a given location or to transfer to an area better suited to the needs of the patient).

4. Although coagulopathy in massively transfused patients is often ascribed to simple dilution, the etiology is more commonly multi-factorial. Dilution of coagulation factors and platelets is a factor, but consumption (including DIC), hypothermia and hypocalcemia can also play a part. Ideally, coagulopathy is managed by close monitoring of the following coagulation parameters:

- A. Hemoglobin
- B. Platelet count
- C. Fibrinogen
- D. Prothrombin time (PT)
- E. Partial Thromboplastin time (PTT)
- F. INR
- G. TEG (IMMC/BCH only)

\*\*\* Note: After transfusion of components, allow an interval of approximately 15 minutes for equilibration before follow-up coagulation tests are drawn.

5. Due to the time interval needed to complete the above-mentioned testing, it may not be feasible to perform such testing when the patient is bleeding profusely. In these situations, a formulaic approach is used. The following is an example:
- A. One apheresis platelet contains at least  $3.0 \times 10^{11}$  platelets. This is considered one dose of platelets which is equivalent to 4-6 random donor platelets.

6. Emergency blood components will be prepared as follows:

**IMMC Adults  $\geq$  50 kilograms:**

First cooler:

- Two units of red blood cells along with two units of A liquid plasma; or
- Low titer O Positive Whole Blood (LTOWB) may be substituted as the first cooler by Trauma Services.

Second cooler (an audible request for the second cooler must be made prior to preparing):

- Two units of uncrossmatched red blood cells along with two units of A liquid plasma.

Any subsequent coolers:

- These will automatically be prepared with six additional units of red cells and six thawed plasma. One cold-stored, pheresis or acriodose platelet will also be issued.
- As additional coolers are needed, each cooler will contain six units of blood and six plasma. A cold-stored, pheresis or acriodose platelet will also be issued at the time the cooler is issued. This will continue until the situation is resolved.

**Pediatrics 21-49 kilograms:**

First cooler:

- Two units of red blood cells along with two units of A liquid plasma; or
- (LTOWB) may be substituted as the first cooler by Trauma Services for children  $> 12$  years of age.

Second cooler (an audible request for the second cooler must be made prior to preparing):

- Two units of uncrossmatched red blood cells along with two units of A liquid plasma.

Any subsequent coolers:

- These will automatically be prepared with four additional units of red cells and four thawed plasma. One cold-stored, pheresis or acrodose platelet will also be issued.
- As additional coolers are needed, each cooler will contain four units of blood and four plasma. A cold-stored, pheresis or acrodose platelet will also be issues at the time the cooler is issued. This will continue until the situation is resolved.

**Pediatrics ≤ 20 kilograms:**

First cooler:

- Two units of red blood cells along with two units of A liquid plasma; or
- (LTOWB) may be substituted as the first cooler by Trauma Services for children > 12 years of age.

Second cooler (an audible request for the second cooler must be made prior to preparing):

- Two units of uncrossmatched red blood cells along with two units of A liquid plasma.

Any subsequent coolers:

- These will automatically be prepared with four additional units of red cells and four thawed plasma. One cold-stored, apheresis or acrodose platelet will also be issued.
- As additional coolers are needed, each cooler will contain two units of blood and two plasma. A cold-stored, apheresis or acrodose platelet will also be issues at the time the cooler is issued. This will continue until the situation is resolved.

**ILH All Patients:**

First cooler:

- Two units of red blood cells will be issued.

Second cooler (an audible request for the second cooler must be made prior to preparing):

- Two units of uncrossmatched red blood cells will be issued.

Any subsequent coolers:

- These will automatically be prepared with four additional units of red cells and four thawed plasma. One apheresis or acrodose platelet (obtained from LifeServe) will also be issued.

**MWH All Patients:**

First cooler:

- Two units of red blood cells will be issued.

Second cooler (an audible request for the second cooler must be made prior to preparing):

- Two units of uncrossmatched red blood cells will be issued.

Any subsequent coolers:

- These will automatically be prepared with four additional units of red cells and four thawed plasma. One apheresis or acrodose platelet (obtained from LifeServe) will also be issued.

\*\*\* Note: In all cases cryoprecipitate will be thawed only upon request. Standard adult dose is 10 cryoprecipitate (which is two separate bags of cryo, each with 5 cryoprecipitate.)

\*\*\* Notify the blood bank with the situation is resolved and the massive transfusion should be stopped.

## **PROCEDURE**

Physician evaluates the need for uncrossmatched red blood cells and other blood products

1. Notify the Blood Bank immediately upon implementation **AND** upon termination of massive transfusion protocol. Notify when:
  - A. Transfusion needs may be large.
  - B. Patient is transported/transferred to another area.
2. Designate one person of the team to be the “communicator” with the Blood Bank staff so that all information travels accurately and there is not duplication. Notify the Blood Bank staff IMMC: 515-241-6856, ILH: 515-263-5588 or MWH: 515-343-1725 of implementation by direct request from the Emergency Trauma Department, Surgical, Anesthesiology or Medical staff of massive transfusion protocol. The following information should be provided to the Blood Bank:
  - A. Patient name
  - B. Medical Record Number (MRN)
  - C. Typenex number, if assigned
  - D. Physician name requesting the uncrossmatched blood
  - E. Reason for the need
  - F. Weight of the patient in kilograms for pediatric patients. \*\*\* If no weight is communicated, the lab will assume this is an adult.
3. Immediately obtain a specimen for Type and Prepare according to proper protocol. The Type and Prepare specimen should be obtained before transfusion, if possible, to obtain an accurate patient type.
4. If blood is needed immediately (before any testing is completed), the Blood Bank at IMMC will emergently release a traumatic pack as listed above. The Blood Banks at MWH and ILH will emergently release as listed above. The Blood Bank Emergency Request for Uncrossmatched Blood form will accompany the uncrossmatched blood to the patient care area for the physician signature. This documentation can occur after the emergency is over, typically within 24 hours.
  - A. Blood Bank staff initiate the Emergency Request for Uncrossmatched Blood form based on the information shared via telephone.
  - B. Requesting physician will complete the Emergency Request for Uncrossmatched Blood form required for Blood Bank as soon as possible. Top copy to chart, bottom copy to lab.
5. Blood Bank will notify their supplier (LifeServe Blood Center) of the massive transfusion situation upon initiation and completion. It is imperative the start and completion of the massive transfusion is communicated with the Blood Bank
6. If the patient is transferred from the current location, the cooler of red blood cells and/or plasma should be transported with the patient. Notify Blood Bank of patient transfer to new location. \*\* \* **Note:** Cryoprecipitate and platelets must be stored at room temperature. If cryo and platelets are not immediately given, immediately return products (cryoprecipitate and platelets) to Blood Bank for safe storage and possible reissue.
7. Communication that bleeding has subsided/stabilized or patient has expired, is imperative. The Blood Bank will then slow or stop the component preparation process.

8. Immediately return all unused blood components to the Blood Bank.
9. If there is any reason to suspect that transfusion aggravated the original problem or contributed to a death or complication, notify the Blood Bank pathologist and follow the Blood Transfusion Reaction protocol.
10. Tranexamic acid (TXA):  
Consider administering Tranexamic acid TXA if:
  - A. Activation of massive transfusion protocol
  - B. Known fibrinolysis by TEG
  - C. Only administer TXA if less than 3 hours from time of injury

**ADULTS:**

If given prehospital:

1 gram IV over 10 minutes for total of 2 grams

If not given prehospital:

2 grams IV over 20 minutes

**PEDIATRICS:**

If given prehospital:

15 mg/kg (1000 mg MAX) over 10 minutes for total of 30 mg/kg

If was not given prehospital:

30mg/kg (2000 mg MAX) over 20 minutes

11. Calcium Gluconate:

Consider administering calcium gluconate:

**ADULTS:**

- 2 grams IV after the first 2 units of RBCs given
- 2 grams IV after each additional 4 units RBCs given

**PEDIATRICS:**

- 50 mg/kg (max 2,000 mg) IV after first 2 units of RBCs given
- Dosing may be repeated to maintain ionized calcium between 1.14 -1.29 mg/dL

**References:**

7. ACS TQIP massive transfusion in trauma guidelines, 2014.
8. Napolitano LM, et al. Tranexamic acid in trauma: How should we use it?. *J Trauma Acute Care Surg.* 2013 Volume 74, Number 6