Division of Acute Care Surgery Clinical Practice Policies, Guidelines, and Algorithms:
Adult Massive Transfusion Protocol
Clinical Practice Policy

Original Date: 12/2005
Supersedes: 06/2011
Last Review Date: 10/2014

Purpose: To describe the process of rapidly providing number and composition of blood and blood components to the acutely injured patient.

For all patients predicted or suspected of requiring substantial transfusions, the institution’s massive transfusion protocol (MTP) should be activated immediately. In addition, patients in whom the use of uncross-matched blood or plasma is required should also have the MTP activated immediately. Blood from the MTP will not be fully cross-matched but rather type specific. Patients likely to require MTP are those with two of the following: (1) EC arrival heart rate >120, (2) EC arrival systolic blood pressure < 90 mmHg, (3) positive FAST exam, (4) penetrating trauma mechanism, or (5) use of uncross-matched blood in EC. Using these parameters, the clinician will be correct 86% of the time with PPV of 53% and NPV of 96%. These parameters are consistent with the concept of acceptable over-triage and minimizing under-triage. Remember, the blood products can always be returned and used for another patient while not having the appropriate number and type of products when you need them can be a lethal omission.

1. To activate the protocol, the blood bank should be called immediately at 4-3640. Simultaneously, the green blood requisition slip should be labeled and sent by “runner” to the Blood Bank. The requisition slip should NOT include a specific number of products once the MTP is activated. Rather, the letters “MTP” or the word “MASSIVE” should be written across the green requisition slip.

2. If the patient remains unstable and it is the trauma team’s opinion that the patient cannot wait (5-10 minutes) for the release of the first box of type specific product then uncross-matched products can be released (6 units of o-negative RBC and 6 units of thawed AB plasma). In these situations, the team should notify the Blood Bank to immediately release products pending type and screen. If the patient’s clinical situation allows or if the Blood Bank already has run the type and screen) then the standard MTP cooler will be released with 6 units of RBC, 6 units of plasma and a 6 pack platelet equivalent.

Massive Transfusion Protocol:

1. Definitions: 1 jumbo plasma equals 2 to 3 regular plasma units. 1 “dose” of platelets is equal to either 6 Random-Donor platelet units or 1 apheresis platelet unit.
2. 1 dose of platelets will be issued with every 6 units of RBCs and 6 units of plasma. This platelet dose will be repeated after every 6 additional RBCs issued.
3. After the first cooler leaves the Blood Bank, the Blood Bank will then prepare 6 RBCs and 6 plasma (or 2-3 Jumbo plasma) and 1 platelet dose. This component order will be available within 5-10 minutes of the first cooler leaving the Blood Bank. This process will automatically be repeated each time the set of components is issued until the attending Trauma Surgeon or Anesthesiologist notifies the Blood Bank that the MTP is no longer needed or the patient arrives in the STICU.
4. The goal of this MT guideline is a transfusion ratio of 1:1:1 (plasma:platelets:RBCs) starting with the first units transfused.
5. Requests for components exceeding this protocol, as well as cryoprecipitate, may be made at any time by direct notification of Blood Bank (4-3640).
6. Blood coolers should follow the patient at all times to prevent duplicate blood orders and unavailability of blood when needed by the patient.
7. No blood components will be issued without a pickup slip with the recipient’s medical record number and name.
8. Laboratory tests should be drawn initially and then as clinically indicated (at least after each cooler of products has been transfused).
   - CBC
   - TEG
   - Arterial or venous blood gas
9. Subsequent coolers can be adjusted and or modified based on returning TEG values as illustrated below:

<table>
<thead>
<tr>
<th>ACT &gt; 128</th>
<th>Transfuse plasma and RBC</th>
</tr>
</thead>
<tbody>
<tr>
<td>r-value &gt; 1.1</td>
<td>Transfuse plasma and RBC</td>
</tr>
<tr>
<td>k-time &gt; 2.5</td>
<td>Transfuse plasma Add cryoprecipitate/fibrinogen if angle also abnormal</td>
</tr>
<tr>
<td>α-angle &lt; 60</td>
<td>Transfuse cryoprecipitate (or fibrinogen) Add platelets if mA is also abnormal</td>
</tr>
<tr>
<td>MA &lt; 55</td>
<td>Transfuse platelets Add cryoprecipitate/fibrinogen if angle also abnormal</td>
</tr>
<tr>
<td>LY-30 &gt; 3%</td>
<td>Administer tranexamic acid or amino-caproic acid</td>
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