

**TRAUMA SERVICES**  
**DEPARTMENTAL GUIDELINES AND**  
**PROCEDURES**

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**TITLE:** MASSIVE TRANSFUSION PROTOCOL (MTP) IN TRAUMA

**PURPOSE:** To provide a guideline to support the patient with massive hemorrhage by the administration of packed red blood cells and/or other blood products, while preventing coagulation disorders and providing guidelines for red cell replacement and correction of any coagulation disorders noted.

**GUIDELINE/PROCEDURES STATEMENT:**

**DEFINITIONS:**

**MTP** – an infusion, within a 24 hour interval, of a volume of blood approaching or exceeding replacement of the recipient's total blood volume.

**Total Blood Volume** – Male patients: 75 ml/kg; Female patient: 65 ml/kg

**I. PROCEDURE:**

**Emergency Center (EC) Transfusion Policy:**

1. A sample for type and cross should be sent as soon as possible after arrival of the trauma patient.
2. Type specific blood should be transfused if and/or when the results of the type and/or crossmatch are available.
3. Two O positive and two O negative red blood cells (RBC) stat blocks, as well as an AB thawed plasma stat block, are available in the EC stat block refrigerator for emergent use. Each RBC stat block contains 2 RBC units while the AB thawed plasma stat block contains 1 jumbo AB thawed plasma unit.
4. Female patients < 50 years old and all patients under 18 years of age should be given O negative blood in the following situations:
  - a. ABO blood group and/or Rh is not yet known and the patient needs resuscitation with RBCs.
  - b. ABO blood group and Rh are known, but type specific blood is not available in sufficient quantities to support adequate resuscitation.

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5. Male patients > 18 years old and female patients > 50 years old should be transfused with O positive blood in the following situations:
  - a. ABO blood group and/or Rh is not yet known and the patient needs resuscitation with RBCs.
  - b. ABO blood group and Rh are known, but type specific blood is not available in sufficient quantities to support adequate resuscitation.

**Procedure:**

*When to activate the Massive Transfusion Protocol (MTP):*

1. **The MTP should be activated with the initiation of the third unit of RBCs in trauma patients. In the Emergency Center, this should likewise trigger:**
  - a. **Transfusion of the AB thawed plasma stat block.**
  - b. **Tranexamic Acid (TXA) Protocol activation, given the initiation is within 3 hours of the traumatic event.**
2. The MTP may be activated by operative (Trauma Surgery, OB/GYN, Orthopedic Surgery, Neurosurgery), Emergency Medicine, or Anesthesia Attendings.
3. Activation of the MTP must be documented in the electronic medical record.

*How to activate the Massive Transfusion Protocol (MTP):*

1. The Blood Bank shall be notified by phone (by Nursing or Anesthesia [if in the Operating Room]) immediately upon the physician's order to institute the MTP (Ext. 33250).
2. Nursing personnel will draw a specimen for Type and Crossmatch and will place a Blood ID Band on the patient. The specimen for Type and Crossmatch will be delivered to the Blood Bank (2F: 2-PA 71).

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*What blood products to expect with the Massive Transfusion Protocol (MTP):*

1. Six units of type specific RBCs, 2 jumbo units of thawed plasma (4 random plasma), and 1 apheresis platelet (6 pack) will be prepared upon initiation of the MTP and receipt of the blood sample for Type and Crossmatch.
2. The Blood Bank will then have 6 units of RBCs, 2 jumbo units of thawed plasma, and 1 apheresis platelet available at all times for delivery to the patient. Each time the blood is issued, another 6 units RBCs, 2 jumbo units of thawed plasma, and 1 apheresis platelet will be prepared until the MTP is terminated.
3. **The preferred transfusion ratio is 6 units of RBCs : 2 jumbo units of thawed plasma : 1 apheresis platelet. This constitutes one round of the MTP.**

*Additional things to consider with the Massive Transfusion Protocol (MTP):*

1. In trauma patients, the following laboratory studies will be ordered throughout the MTP's activation:
  - a. Thromboelastogram (TEG), complete blood count (CBC), prothrombin time (PT), partial thromboplastin time (PTT), international normalized ratio (INR), and fibrinogen on activation
  - b. TEG, CBC, PT, PTT, INR, and fibrinogen every 4 hours (and as indicated)
  - c. The ratio of blood products transfused may/should be adjusted based on the laboratory results as the MTP progresses.
2. **The Rapid Infuser (and/or fluid warmer) should be utilized for all MTPs.**
3. All policies regarding identification of patients, specimens, labels, requests, and arm-bands must be followed rigidly.
4. The MTP should be **terminated** as soon as possible once the patient has stabilized (as determined by the Attending Surgeon) by notifying the blood bank.
5. When the volume transfused equals or exceeds 8 units of RBCs for women and 10 units of RBCs for men, the following compatibility testing will apply:
  - a. If the antibody screen is negative, the patient will be retyped as an ABO check and Type Specific or Type Compatible RBCs issued.

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