Trauma Massive Transfusion Protocol (MTP)

NOTE: Requires Physician Order for Implementation

Patient Outcomes:
1. The patient with uncontrolled hemorrhage will be provided rapid restoration of intravascular blood volume and maintain oxygen carrying capacity and hemostasis.
2. The patient will achieve optimal outcomes through appropriate monitoring, product selection and administration.

Non-physician Licensed Professionals authorized to implement role-appropriate aspects of this protocol:

X Registered Nurse  [ ] Respiratory Therapist  [ ] Pharmacist  [ ] Physical Therapist  [ ] Speech Therapist
[ ] Occupational Therapist  [ ] Registered Dietitian  [ ] Imaging Technician  X Other: Blood Bank, Transfusionist

PROTOCOL:
For patients that are activated as a Type 1 unstable trauma, blood bank transports a cooler containing 3 units group O blood and 3 units non type specific plasma.

1. Initiation:
   a. Massive transfusion is initiated by the trauma attending in order to prevent complications associated with large blood volume replacements and requires that the patient has a current crossmatch specimen and a confirmation blood type on file in the laboratory (current or historical). The following clinical triggers may be used to assess which trauma patients will most likely benefit from the initiation of massive transfusion.

2. Assessment:
   - **Assessment of Blood Consumption (ABC) Score**
     - Emergency Department systolic blood pressure ≤ 90 mmHg (0 = no, 1 = yes)
     - Emergency Department heart rate ≥ 120 b.p.m. (0 = no, 1 = yes)
     - Penetrating mechanism (0 = no, 1 = yes)
     - Positive fluid on abdominal ultrasound (FAST exam) (0 = no, 1 = yes)

       Score of 2 predicts 36% need for massive transfusion
       Score of 3 predicts 45% need for massive transfusion
       Score of 4 predicts 100% need for massive transfusion

3. The following procedures are intended to rapidly diagnose consumptive coagulopathy and uncontrolled hemorrhage and initiate aggressive replacement component therapy.

4. Upon activation of this protocol the Transfusion Service will prepare a Massive Transfusion Protocol (MTP) Pack in a blood storage container in order to expedite requests for emergency large volume transfusion needs. The pack will include 6 units of LR-RBC’s, 6 units of thawed plasma, (plasma takes approximately 20 minutes to thaw and may not be available until the second pack).

   a. Massive Transfusion Pack will consist of:
      i. 6 units LR-RBCs
      ii. 6 units FFP (or equal volume in jumbo packs)

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iii. 1 Single Donor Platelet (apheresis) with every other pack

5. Transfusion trigger for platelets will be at the judgment of the trauma surgeon considering presence of clot in the surgical field. If more platelets are needed, the attending surgeon will order them to be sent with the MTP pack as needed.

6. Activation
   a. The MTP will not be initiated prior to patient arrival.
   b. Initial blood specimen and confirmatory blood sample must be drawn and sent for type and cross match prior to initiation of massive transfusion protocol to ensure optimal utilization of available inventory and to prevent depletion of universal donor inventory.
   c. The MTP pack (6 units LR-RBCs, 6 units thawed plasma) will NOT be prepared for delivery until an initial blood sample for typing as well as the confirmatory 2nd sample is received. While waiting for crossmatch samples, the blood bank will release products on an as needed basis per physician order. RBCs will be labeled as uncrossmatched and the Release from Liability for the Use of Uncrossmatched Blood form will be required until any necessary pretransfusion testing is completed.
   d. MTP activation is ordered by the Trauma Attending Physician responsible for the care of the patient.
   e. The physician or designee will immediately place an order into the Epic/O2 System to initiate protocol.

7. Blood Bank
   a. The blood bank physician on-call will be notified by the blood bank that MTP has been activated. Pathology resident support for communication and product utilization will be provided when staffing allows.
   b. Procedure: Prepare the MTP pack in a storage container.
      i. The MTP pack will be available for transfusion every 30 minutes for four hours until discontinued by a trauma attending or designee. Blood bank will stay ahead one MTP pack.
      ii. The MTP Pack may be picked up from the Blood Bank for delivery to the patient care area or delivered to the OR using the OR dumbwaiter. Appropriate patient identification including patient’s name and medical record number will be required and can be brought to the blood bank by the runner or ordered in Epic for delivery through the OR dumbwaiter. Downtime Blood Product Delivery Request forms may also be utilized as necessary.
      iii. Cryoprecipitate will be utilized as indicated by lab results and physician determination.

8. Transfusionist
   a. All blood products will be administered through a large bore intravenous catheter via warming device and/or rapid infuser.
   b. I-Stat will be run every 30 minutes.
   c. It is recommended that the following labs be drawn prior to initiation of the Protocol and then every 60 minutes during the Protocol:
      i. Hgb/Hct
      ii. Sodium (Na)
      iii. Potassium (K)
      iv. Glucose
      v. ABG
      vi. PT/PTT

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vii. Platelet count
viii. Fibrinogen
ix. D-Dimer
x. INR

d. Record all fluid infused, all blood products given, and all output on the appropriate flow sheet.
e. Monitor vital signs including temperature every 15 minutes and document. Utilize the hypothermia standard of practice to maintain normothermia.
f. Monitor, document, and notify physician of all lab results.
g. Platelet products not transfused immediately must be returned to the blood bank within 30 minutes of issue. RBC and plasma may be stored in approved blood coolers for up to six hours, but should be returned to the laboratory as soon as it is determined they will not be required for transfusion.
h. The blood bank must be notified by the patient's nurse, or their designee, as patient travels during massive transfusion (i.e. radiology, OR).

9. Patients on Coumadin (Warfarin)
   a. Hold warfarin and administer Vitamin K 10 mg by slow IV infusion and supplement with prothrombin complex concentrate.
   b. Please refer to the "Treatment of the Warfarin Anticoagulated Patient with Suspected Head Injury (PCC/Kcentra) Guideline".

10. Factor VIIa
    a. Factor VIIa MUST BE ORDERED BY AN ATTENDING per the 'Factor VIIa Utilization Policy'

11. Tranexamic Acid (TXA)
    a. Consider the use of TXA early
    b. Indicated for trauma associated hemorrhage but SHOULD NOT be given if patient is receiving prothrombin complex concentrate
    c. TXA must administered within 3 hours of injury

12. Discontinuation
    a. The Massive Transfusion Protocol must be discontinued by the trauma attending or designee. The blood bank must be notified as soon as feasible and any remaining blood products that are not required for immediate transfusion needs should be returned to prevent product wastage.
    b. After eight MTP packs of (48 units LR-RBCs), have been administered to the trauma patient, a conversation will take place to determine the utility of continuing the protocol. The conversation will be initiated by a representative from the blood bank and the parties involved in this conversation will include the Trauma Attending, Anesthesiology Attending and the pathologist who is available. Discussion points will include: current lab results, temperature, possibility of achieving hemostasis and probability of survival. If the decision is made to continue the protocol then a discussion will take place again after every two MTP packs.

13. Performance Improvement
    a. All patients receiving the Protocol will be reviewed collaboratively between trauma and blood bank to assure quality is maintained.
    b. Performance improvement indicators will include: timeliness, quality/appropriateness of products used, wastage, adjunct use (warmer, infuser), and documentation.
    c. Review Frequency:
       i. Quarterly review to look for themes and trends.

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ii. **Goal:** Each MTP activation will be reviewed collaboratively between trauma and blood bank within 1 week and feedback provided to all those that were involved.

**REFERENCES:**


**REVIEWED BY:**

Trauma Performance Improvement Committee
Chair, Pathology and Laboratory Medicine
Blood Bank Manager
Blood Utilization Committee
Blood Bank
Executive Committee Medical Staff; 1/23/2014

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