POLICY NUMBER: PM02-48
CATEGORY: Patient Care
DATE: 07/10/2006

TITLE: Massive Transfusion Protocol (MTP)

POLICY: An MTP will be enacted when, in the opinion of the responsible physician, there will be a presumed need for the transfusion of at least 10 units of packed red blood cells (PRBC) in an adult patient or at least 5 units of PRBC in a child within a short time frame (i.e. 2-hour time period).

PURPOSE: To define who can enact an MTP, what will occur during an MTP, how information, blood, and blood products will flow during an MTP, how the data will be tracked during an MTP, and what parameters will be reviewed during a quality assessment after an MTP has been conducted.

SPECIAL INSTRUCTIONS:

DEFINITION: Massive Transfusion - at Shands at the University of Florida is defined as a presumed need for the transfusion of at least 10 units of packed red blood cells (PRBC) in an adult patient or at least five (5) units of PRBC in a child within a short time frame (i.e. two (2)-hour time period).

I. Physiological Goals

Life-threatening hemorrhage and the need for massive transfusion is accompanied by a wide variety of physiologic changes. In addition to the delivery of blood products, other goals during an MTP are to:

A. Prevent dilutional coagulopathy

B. Monitor appropriate laboratory tests and physiologic parameters

C. Avoid wastage of blood products via coordination and communication between the Blood Bank and identified individuals at the treatment site regarding the status of these patients.

D. INR < 1.7

E. Fibrinogen > 100mg/dL

F. Platelet count > 100,000/uL while patient is actively hemorrhaging

G. Prevent symptomatic anemia

H. Maintain core temperature > 35° C.

I. Prevent hyperkalemia

J. Prevent hypocalcemia

K. Avoid transfusion reactions

II. Materials required in an MTP

A. MTP Order Form (Appendix 2)

B. Satellite Blood Bank refrigerators in the Operating Room and Emergency Department

C. Product transport coolers

D. Product coolant packs

E. Pre-warmed crystalloids

F. Large Bore IV catheters (#16 gauge IV catheter for adults, #9 French central line introducer)

G. Rapid infusion warming device (must have one or more of the following):

1. level I Fluid Warmer

2. Fluid Management System (FMS)

3. Rapid Infusion System (RIS)

H. Air convection warming system to maintain core temperature

I. I-Stat and cartridges

III. Specimen Requirements

A. A new specimen must be sent to the Blood Bank as soon as an MTP is initiated, even if the patient has a current specimen in the Blood Bank. The specimen must be legibly labeled with:

1. Patient name (first and last name or trauma designated name);

2. Patient Medical Record Number (if available);

3. Date and time of collection;

4. Initials of the collector;

5. Blood Bank identification number.

B. Preferred specimen is venous blood collected in 6 mL K_2 EDTA (pink/purple top tube). Emergently, any anticoagulated or clotted specimen can be used.

C. The patient specimen will be rejected if not labeled properly and another specimen requested.

D. If a sample is not delivered to the Blood Bank, the Blood Bank cannot provide type-specific blood products.

IV. Procedure for initiating MTP

A. Only the following individuals may initiate an MTP in the Emergency Department, Operating Room, or Intensive Care Unit:

    1. Attending physician

    2. Fellow

    3. Chief Resident/Acting Chief Resident (R4 and above).

B. The responsible physician will give a verbal order and must state “Initiate Massive Transfusion Protocol” to the designated nurse communicator.

C. The role of the nurse communicator is paramount to a successful MTP and patient outcome.

    1. The designated nurse communicating with the Blood Bank depends on where the MTP is initiated. When patients move between treatment care areas, it is the job of the nurse communicator to interact directly with his or her counterpart in the new treatment area to assure continuity of the process. The nurse communicators in the 3 different areas are:

        a. Emergency Department – Scribe Nurse
        b. Operating Room – Charge Nurse or RN designee
        c. Intensive Care Unit – Charge Nurse

    2. Immediately call the Blood Bank on a designated phone via speed dial or designated Blood Bank extension (4-6820) depending on location.

    3. Inform the Blood Bank of the following:

        a. That an MTP has been initiated
        b. Patient name
        c. Medical Record Number (MRN)
        d. Gender
        e. Age
        f. Weight
        g. Name of physician initiating the MTP
        h. Location and phone number
        i. Assures the specimen is drawn, labeled, and sent to the Blood Bank

    4. Initiate documentation on the MTP Order Form (Appendix B) that will serve both as a record of the MTP and a written order to be entered into the patient chart at completion of the MTP.

D. If a sample is not delivered to the Blood Bank, the Blood Bank cannot provide type-specific blood products.

E. Product/shipment Prep Time: all shipments should take no longer than 30 minutes to prepare.

F. An overview of the entire MTP process can be found in the MTP process flow sheet (Appendix C).

G. Dispensing Blood Products:

1. Blood products will be dispensed per the current practices.

2. Blood products will be dispensed in the approved Blood Bank coolers.

3. Blood products are shipped in predetermined quantities and ratios of RBC: Thawed plasma, platelets, and cryoprecipitate as outlined in, MTP Schedule (Appendix A). The ratio of different blood products shipped is not intended to be a mandate for transfusion of those products, simply to ensure that adequate products are available at the bedside. These ratios were determined to be reasonable and effective by a team of hematologists and transfusion medicine specialists; however, the responsible physician can decide which products to transfuse based on the patient's clinical and laboratory value status.

4. If the clinician determines that a different ratio of products is needed, the clinician must communicate the change and whether the blood products are in place of, or in addition to, the next required shipment.

H. Designated "runners" from each treatment area transport products and specimens.

1. Designated "runners" are:

a. Emergency Department (ED) – Critical Care Technician
b. Operating Room (OR) – Patient Support Technician
c. Intensive Care Unit (ICU) – Unit Clerk

2. All "runners" will have completed a web-based training module that includes education regarding universal precautions, blood product transport, the proper route to travel and use of the designated blood transport cooler.

3. Products will be transported in designated blood transport coolers with a blood product shipment care.

4. It is the responsibility of the "runner" to return blood coolers to the Blood Bank after the MTP is terminated.

5. The appropriate route must be followed and, when available, the designated elevator with key should be used.

6. "Runner" takes specimen from the treatment area to the Blood Bank and awaits shipment to bring back. It is the sole responsibility of the "runner" to bring specimens to the Blood Bank and blood products to the treatment area during the MTP. Specimens must meet labeling criteria set forth in Section III-A.

V. Changes/Discontinuance of Protocol

A. Changes in Protocol

1. If there is a change in the need for blood products during the protocol, the responsible physician must submit the change via a verbal order to the nurse communicator to avoid any confusion and deviation from the protocol.

2. This order must describe the change and the duration of the change.

B. Continuance of Protocol

The protocol may be continued into another treatment area. The nurse communicator from the originating site must:

1. Have a face-to-face hand-off with the nurse communicator from the next site;

2. The MTP Order Form must be transferred;

3. The Blood Bank must be notified, and;

4. The available products must be transported in a cooler with the patient.

C. Intensive Care Unit/Operating Room

Note: Blood to be used within 30 minutes can remain in the cooler; other products must follow standard ICU/OR policy with respect to refrigeration.

D. Discontinuation of Protocol

1. The physician responsible must notify the nurse communicator that the MTP is to be discontinued.

2. The nurse communicator must call the Blood Bank immediately via the designated phone or extension (4-6820).

3. To avoid blood product wastage, communication must be as rapid as possible.

4. The Blood Bank will automatically terminate the MTP if there is a 1-hour period without a request for blood after the last shipment.

VI. MTP Protocol

A. Initiation of Protocol

1. MTP initiated by responsible physician.

2. Nurse communicator contacts Blood Bank to inform that an MTP has been initiated. It is the responsibility of the Blood Bank to determine the most appropriate blood and Rh type for the individual patient.

Note - For treatment areas in the ED and OR, MTP Shipment #1 can be found in the on-site, satellite Blood Bank refrigerator (See Section V regarding on-site satellite Blood Bank refrigerator). For the ICUs, the “runner” will bring the first shipment from the Blood Bank.

B. Blood Bank (See Appendix A for the scheduled blood product shipments for MTP)

1. The Blood Bank will place 10 units of RBCs and 4 units of thawed or liquid plasma along with a coolant pack in the approved transport cooler. One unit of platelets will be transported at room temperature. All products will be prepared according to established Blood Bank policy.

2. An appropriate blood product shipment card will be attached to the cooler.

3. The Blood Bank will notify the treatment area any time there is a problem or delay with a future shipment.

4. The Blood Bank will stay one shipment ahead until the MTP is terminated.

5. Blood type in subsequent shipments may vary depending on type, screen, and available inventory.

5. Any deviation from this schedule must be presented in the form of a written or electronic order.

C. Recommendations for NovoSeven coagulation factor VIIa (recombinant) – rFVIIa is governed by Shands at the University of Florida hospital-wide treatment guidelines for use of rFVIIa for non-hemophiliac bleeds (Recommended Guidelines for Use of Recombinant Factor VIIa (rFVIIa) in the Treatment of Non-hemophiliac Bleeding). The following are recommendations only and, if clinically warranted, must be ordered from pharmacy:

1. rFVIIa – 4.8 mg with Shipment 2

2. rFVIIa – 2.4 mg with Shipment 4

3. Recommended dosage of recombinant factor VIIa in pediatric trauma patients requiring massive transfusion:

   a. > / = 50 kg = 4.8 mg
   b. 40 – 49 kg = 3.6 mg
   c. 25 – 39 kg = 2.4 mg
   d. < 25 kg = individualized dosing (70 – 90 mcg/kg)

4. rFVIIa will be shipped from pharmacy in a transport cooler along with coolant packs.

5. rFVIIa will be shipped in its unreconstituted state; therefore, the product will need to be reconstituted in the treatment area.

6. Pharmacy will send brief reconstitution instructions along with the product.

VII. Satellite Blood Bank refrigerator located in Emergency department and Operating Room only.

A. Satellite Blood Bank refrigerators are under the direction of the Blood Bank and must be regulated in accordance with AABlood Bank and JCAHO standards.

B. It is the responsibility of the Blood Bank to regulate the inventory and stocking of the ED/OR satellite refrigerators.

C. For policy refer to Guideline for Use of ED/OR Satellite Refrigerators “Unassigned Uncrossmatch Units”.

VIII. Suggested laboratory monitoring schedule

A. Laboratory tests may be helpful in the treatment of hemorrhaging patients and should be used at the discretion of the responsible physician. Following are suggested labs to follow:

B. The following lab tests are available by I-Stat and should be monitored every 30 minutes during the MTP.

1. Hematocrit
2. Ionized Ca+
3. Arterial blood gases
4. PT/INR

C. The following lab tests are available in the Main Lab and can be used at the discretion of the responsible MD to guide management:

1. Fibrinogen
2. Platelet count
3. TEG

IX. MTP Order Form

A. The MTP Documentation Form must be used as the official documentation for all MTPs.

B. All areas on the form must be completed.

C. The completed form facilitates:

1. Accurate and timely tracking of blood product deliveries and transfusions.

2. Adherence to the MTP process.

3. Documentation of patient status and outcomes

D. The form serves as both the documentation tool and order form and must be signed by the responsible physician and a registered nurse.

E. At the completion of the MTP the original MTP Order From will be kept in the patient medical record, one copy must be sent to the Blood bank and one copy to the Shands at the University of Florida Transfusion Committee.

X. Quality Improvement Process following MTP

A. Every MTP will be subject to review by the Transfusion Committee and the specific department committee involved.

B. Specifically, the following performance indicators must be monitored for appropriateness of process, timeliness and outcomes:

1. Number and types of units used

2. Number and types of units used

3. Timing of delivery

4. Survival/Outcomes

APPROVED:

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