

## Appendix T: Sample Massive Transfusion Procedure Miller Children’s and Women’s Hospital

Note: This is a SAMPLE developed for a particular facility as an example to work from. You may need to adjust based on the individual circumstances of your facility.

<b>SUBJECT:</b>		BLOOD AND BLOOD COMPONENTS: EMERGENT MASSIVE TRANSFUSION PROCEDURE (MTP): ADULT	REFERENCE # PL-524
	SYSTEM	MILLER CHILDREN’S AND WOMEN’S HOSPITAL LONG BEACH	PAGE: 1 OF: 2
X	CAMPUS		
	DEPARTMENT		
<b>OWNER:</b>		Patient Care Services; Blood Bank	EFFECTIVE: FEBRUARY 2016

### I. Scope

- A. This procedure applies to adult patients with an order for the Massive Transfusion Procedure or an emergent transfusion when cross matched units are not available.
- B. The Physician or his / her designee is responsible for ordering blood or activating the Massive Transfusion Procedure (MTP) by contacting the Blood Bank (BB). Compliance with this procedure is the responsibility of licensed staff.

### II. Policy

- A. The purpose of this policy is to ensure quality patient care by providing an expedited process to obtain an appropriate mix of blood and / or blood components for a patient who is experiencing significant blood loss or an emergent transfusion; to facilitate the ordering and release of blood products in an emergent situation in the most timely and efficient manner; to outline the process of providing rapid restoration of intravascular blood volume, maintain oxygen carrying capacity, and coagulability of the blood.
- B. Emergency transfusions / the MTP will be initiated by the Physician if clinical indications exist, in order to prevent complications associated with large blood volume replacements. The MTP is indicated specifically for a critically-ill patient likely to require the rapid transfusion of greater than 6- 10 units of blood and blood components within two (2) hours, and has the potential to progress to consumptive coagulopathy and uncontrolled hemorrhage.
- C. If a patient safety event not primarily related to the natural course of the patient’s illness or underlying condition (i.e., placenta previa) occurs intrapartum through the immediate postpartum period (24 hrs), that requires the transfusion of 4 or more units of packed red blood cells and/or admission to the intensive care unit (ICU) it may be classified as severe maternal morbidity and meet the criteria of a Sentinel Event (i.e., hemorrhage that is unexpected.)

### III. Procedure

**A. Emergency Transfusions:** When blood is urgently needed and cross matched units are not available, CALL BLOOD BANK, Ext. 30815. Specify the following:

- Patient's name and medical record number
- Patient's location
- Number of units and type of component needed.
- Ordering physician's name

The Blood Bank will supply the most compatible blood, based on the blood type information currently available for the patient.

1. Only uncrossmatched O negative (for female patients of childbearing age up to 55 years) or O positive (all other patients) Red Blood Cells (RBCs) will be delivered as quickly as possible.
2. Crossmatching will be completed as rapidly as possible and any incompatibility will be reported to the nurse / physician by phone / intercom. BEDSIDE PATIENT IDENTIFICATION remains an extremely important step prior to transfusion. The attached armband with the patient's name and medical record number MUST be compared with label on the blood component and found to be identical before starting the transfusion.
3. When uncrossmatched Red Blood Cells are delivered, Blood Bank will place an EPIC order: "Emergency Release of Blood Products. This order will be signed by the ordering physician as soon as time permits.

### **B. Massive Transfusion Procedure (MTP)**

1. Initiation of MTP:
  - a. Physician or designee will initiate the MTP by verbal or telephone order if he / she deems it necessary, after a clinical evaluation of the patient. This evaluation can occur upon MD evaluation and / or upon patient arrival into the area, e.g., in the Operating Room (OR), BirthCare Center, or in the Intensive Care Unit (ICU).
  - b. The Physician or his / her designee is responsible for contacting the BB and activating the MTP. An order should be given and timed on the chart to document initiation of the MTP.
  - c. The MTP form (BB FMG102), "Massive Transfusion Protocol Disposition Log" is to be used to track all blood products transfused.
2. Blood Bank Response: The goal of this procedure is to transfuse a 1:1 ratio of packed red blood cells (RBCs) to fresh frozen plasma (FFP), and to transfuse 1 unit of platelets (PLTs) for every 6 units of FFP and RBCs. When the MTP is initiated by physician order, the Blood Bank will do the following:
  - a. Immediately deliver 4 units of uncrossmatched RBCs, 4 units of FFP and 1 unit of platelets to the patient location.
  - b. Continue preparing uncrossmatched RBCs, thawed Plasma, and platelets to "keep ahead" products as follows: also shown in the table below.
  - c. The BB will automatically deliver the Initial Response (Pack 1) after the MTP is activated. Pack 2 will be automatically delivered as soon as it is available. After Pack 2, the BB will wait for a call from the Physician or designee on whether to continue preparing and delivering MTP Packs.

- d. Prepare cryoprecipitate pools as ordered.
- e. The Blood Bank will continue to thaw Plasma in a 1:1 ratio with RBCs and prepare platelets until instructed to stop by the ordering physician, anesthesiologist, or his/her designee.
- f. The Blood Bank will also place an “Activate Massive Transfusion Procedure / Protocol” order in EPIC for the physician to sign whenever EPIC is accessed.

<b>Blood Bank Initial and Keep Ahead Response</b>			
	Initial Response (Pack 1)	(Pack 2)	Keep Ahead
RBCS	4	6	6
FFP	4	6	6
PLTS	1	1	1

### 3. Transfusionist Response

- a. Notify BB after Pack 2, if additional packs need to be prepared.
- b. Draw labs as indicated. Include a CBC, PT, PTT, and FIB (fibrinogen). (All of these tests can be ordered at once as an Acute Bleeding Panel in EPIC for patients where EPIC is accessible).
- c. Order cryoprecipitate from Blood Bank as needed, based on lab results. Utilize the guidelines in section 4 to determine transfusion amounts.
- d. The nurse must complete the MTP form (BBFMG102), “Massive Transfusion Protocol Disposition Log”. Applying each individual unit number sticker on each separate line of the form is acceptable unit number documentation for each blood product transfused.
- e. If possible, continue to draw acute bleeding panel and ionized Calcium level after every 6 RBC transfusions (after each pack is completely transfused).
- f. All blood products will be administered through a large bore intravenous catheter via a warming device or rapid infuser.
- g. Monitor temperature every 30 minutes to help prevent hypothermia. In addition to using a warming device for blood infusion, utilize a warming blanket and other measures as necessary.
- h. Enter all blood / blood products that were transfused into EPIC.
- i. Continue to monitor CBC, PT, and PTT for a minimum of every 8 hours for 24 hours after termination of the MTP, or more frequently if the patient’s condition warrants.
- j. Notify the Blood Bank if the patient is transported to another area in the medical center during the MTP process (i.e., radiology, OR, ICU).
- k. Return completed MTP form and any unused blood products to the Blood Bank as soon as possible to prevent wastage.

### 4. Maintenance of MTP

- a. The Physician will utilize the lab (fibrinogen) results to guide cryoprecipitate transfusion decisions. Fibrinogen levels below 100 mg / dL should be corrected using the table below with the goal of maintaining a fibrinogen level greater than 100 mg / dL. Consider maintaining a level of at least 200 mg/ dL in patients with complex coagulopathy.

b. Guideline recommendations are as follows:

Blood Product	Lab Value	Blood Product Amount
Cryoprecipitate	Fibrinogen < 50	30 units
	Fibrinogen < 100	20 units
	Fibrinogen 100 - 200	10 units

#### 5. Medication Considerations for massive bleeding

##### a. Tranexamic Acid (TXA)

i. In the presence of diffuse non-surgical bleeding with continuous blood product utilization requirements, TXA (an anti-fibrinolytic agent) should be considered.

ii. Dosing for TXA in trauma associated hemorrhage

a. Loading dose: 1 gm infused over 10 minutes (mix in a 50 ml NS bag)

b. Maintenance dose: 1 gm mixed in 250ml NS infused over 8 hours. Begin immediately following loading dose.

iii. Hypotension is a potential adverse effect. Infusion rate must be limited to 100 mg / minute.

##### b. Prothrombin Complex Concentrate: Factor IX (Kcentra)

i. In the presence of life-threatening bleeding with, known warfarin (Coumadin) use, and an elevated INR, (Kcentra) should be used to rapidly reverse the effects of warfarin (Coumadin).

ii. Vitamin K (10 mg IVPB over 20 minutes) should be administered concurrently with Kcentra to maintain Vitamin K-dependent clotting factor levels

iii. Repeat dosing with Kcentra is not supported by clinical trials and is NOT recommended.

iv. Dosing for Kcentra in trauma associated hemorrhage:

Kcentra® Dosing in Adults			
Pre-treatment INR	2 to < 4	4 to 6	> 6
Dose of Kcentra® (units of Factor IX) per kg body weight*	25	35	50
Maximum dose (units of Factor IX)	Not to exceed 2500	Not to exceed 3500	Not to exceed 5000

\* Dose based on body weight but not exceeding 100 kg.

## 6. Termination of the MTP

- a. The MTP must be terminated by the ordering physician or his / her designee. This termination occurs when the physician notifies the Blood Bank via telephone.
- b. The nurse or designated recorder / scribe is responsible for documenting the termination of the MTP in the patient's chart.
- c. All Trauma patients who receive the MTP will be subject to Performance Improvement review to assure quality is maintained. Quality indicators will include: timeliness of blood product delivery and utilization, appropriateness of products used as per MTP guidelines, wastage, adjunct use (warmer, infuser), development of hypothermia, and documentation.

## IV. Documentation

Complete Massive Transfusion Protocol Disposition Log and return a copy of the form to Blood Bank.

## V. References/Authority

### A. AABB Standards

### B. Code of Federal Regulations

### C. College of American Pathologists (CAP) Standards

### D. Joint Commission Comprehensive Manual for Accreditation of Acute Care Hospitals

### E. State of California Biologics Regulation

Reviewed/approved by:	
Pathology Department	September 2015
Trauma Service	September 2015
Pharmacy & Therapeutics Committee	September 2015
Clinical Policy & Procedure Committee	October 2015
Nursing Executive Council	December 2015
Medical Executive Committee	February 2016

### Massive Transfusion Protocol Disposition Log

Date: \_\_\_/\_\_\_/\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_

Employee ID#	Taken out of Refrigerator? (circle)	Donation Identification Number (unit #)	Time  Start / Finish	PRBC	FFP	PLT	Cryo	Volume	Entered in Epic (Ö)
	YES NO								
	YES NO								
	YES NO								
	YES NO								
	YES NO								
	YES NO								
	YES NO								
	YES NO								
	YES NO								
	YES NO								
	YES NO								

*All units must be entered into EPIC. Please return the form to Blood Bank X3xxxx.*

PATIENT LABEL HERE

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Long Beach Memorial Medical Center  
Long Beach, CA.

BB FMG102 11-5-15