1. INTRODUCTION

Massive Transfusion Protocol (MTP) is defined either as the administration of 8 to 10 RBC units to adult patient in less than 24 hours, or as the acute administration of 4 to 5 units in 1 hour. Exchange transfusion of an infant is also considered a massive transfusion.

2. PURPOSE

The purpose of the Massive Transfusion is to provide the practitioners and caregivers with an overview of evidence-based, best practices for the appropriate use of blood and blood components during massive bleeding situations.

3. APPLICABILITY

This applies to situations where patient(s) is/are in need for large volume of blood and blood products due to massive bleeding.

4. RESPONSIBILITIES

4.1. It is the patient's physician responsibility to assess the patient's need for transfusion during the massive bleeding situations and activate Massive transfusion protocol.

4.2. It is the patient's physician responsibility to terminate massive transfusion protocol and communicate with blood bank accordingly.

4.3. It is blood bank responsibility to respond promptly to massive protocol activation and provide required blood and blood products accordingly.

5. POLICY

To provide guidelines for hospital personnel for appropriate actions required in response to the patient requiring massive amounts of blood components. This subset of patient has anticipated volume of blood loss and continuing losses such that waiting for laboratory evaluation of component losses would jeopardize the patient.

6. PROCEDURES

6.1. Indications: The Massive Transfusion Protocol (MTP) will apply to patients with the following clinical indications.

6.1.1. Patients with evidence of hypovolemic shock, indicated by the following:

6.1.1.1. Systolic blood pressure < 70 mm Hg.

6.1.1.2. Heart Rate > 120
6.1.1.3. Respiratory Rate > 35
6.1.1.4. Mental Status: combative or comatose.
6.1.1.5. Skin: Cool, diaphoretic, mottled/Capillary Refill absent

6.1.2. Patients with uncontrolled blood loss intra-operatively.

6.1.3. Any patient in whom it is judged that at least 6 units of blood replacement is immediately required with the likelihood of continued haemorrhage of at least 250 ml/h is a candidate.

6.1.4. Patients who are anticipated to require the replacement of their entire blood volume within a 24 hour.

6.1.5. Trauma situations where the attending Trauma Surgeon deems it necessary to facilitate massive blood volume replacement.

6.1.6. The MTP may be initiated in any patient care area.

6.2. **Activation:** The attending trauma surgeon, attending obstetrician, anaesthesiologist or attending physician, Blood Bank Head or designee will initiate the MTP and indicate if uncrossmatched blood is immediately required. The physician who initiated MTP will call Blood Bank at extension 24439 or 24339, 47112, or OBI 0508590368(60482) to initiate activation of protocol. The initiating physician must immediately sign the Emergency Blood Release form (appendix 8.1) and write in "Adult or Paediatric Massive Transfusion Protocol" as the reason for the patient need. This Emergency Blood release form with fully labelled 7 ml EDTA tube of patient's blood, are to be immediately sent to Blood Bank. The physician who activates the protocol will simultaneously inform the nurse caring for the patient that this protocol was initiated.

6.3. **Blood Bank Procedure Upon Notification**

6.3.1. Issue six units of uncrossmatched RBC blood immediately following the verbal request.

6.3.1.1. Type-specific or type-compatible uncrossmatched blood will be given if a sample has been obtained and ABO and Rh have been completed on that specimen, otherwise first batch Group 'O' Rh Negative packed red cells will be issued for male patients then will shift to Group 'O' Rh positive. For female patients, release first batch Group 'O' Rh Negative RBC available, then switch to Rh positive after authorisation from the of Blood Bank Head or designee approval.

6.3.1.2. The crossmatch workup will still be completed following the release of the uncrossmatched units. The attending trauma surgeon, attending obstetrician, attending anesthesiologist, or attending physician, Blood Bank head will be notified if any evidence that an incompatibility exist upon completion of the crossmatch.

6.3.2. Immediately Prepare four (4) units of fresh Frozen plasma type-specific plasma if the sample received by Blood Bank; otherwise Group AB plasma will be prepared.

6.3.3. Issue one (1) pooled bag of platelets, ABO compatible if blood group is known; otherwise Group AB, A or B Platelets will be used.

6.3.4. Keep ahead six (6) units of packed red blood cells, four (4) units fresh frozen plasma, and one (1) pooled unit of platelets at all times until the MTP is terminated by the authorized physician.

6.3.5. Send the next MTP batch when ED/OR/OB etc. call for it.

Protocol	Red Cell Units	Plasma Units	Platelets Units
Adult	6	4	One Pooled Bag (6 PLTC)
Pediatric			
0-10 kg	1	1	1 (50ml)
11-20 kg	2	2	2 (100 ml)
21-30 kg	3	3	3 (150 ml)
31-40 kg	4	4	4 (200 ml)
41-50 kg	5	4	One Pooled Bag

6.4. **Responsibilities of the patient care area during the Massive Transfusion**

6.4.1. The Emergency Department attending physician, the operating room attending physician, the OB/Gyne in-charge attending physician **MUST** fill out the Emergency Blood Release Form.

6.4.2. The Emergency Department, OB/Gyne Delivery Room and Critical Care Units charge nurse will assign the responsibilities for blood pick up to a staff member in their unit if the porter is not available.

6.4.3. Porter Department in-charge will be informed regarding the MTP initiation.

6.4.4. The infusion of packed red cells and fresh frozen plasma must be started within 30 minutes of the time issued from the Blood Bank or stored in an approved blood refrigerator. All RBC units will be issued cooler box with temperature monitors to

ensure proper storage. Platelets and Cryoprecipitate should not be refrigerated, it must remain at room temperature.

6.4.5. The Emergency Release Form must be signed by a physician before sending the form to Blood Bank. The physician need only to sign once for multiple units. Compliance will be tracked and reported to the Associate Director of Trauma.

6.4.6. The attending trauma surgeon is primarily responsible for termination of blood loss and initiation of adequate venous and arterial access for volume replacement and monitoring.

6.4.7. The attending anaesthesiologist, nurse anaesthesiologist, and/or ED/OR/OB/Gyne nurses are responsible for patient monitoring, communicating with surgeon regarding status of patient and blood loss estimates, drawing and sending blood samples to laboratory, maintenance of adequate access and monitoring lines, transfusion of blood products in each MTP pack as they become available , checking each blood product transfusion against patient ID, communicating with Blood Bank to advise of needs, and appropriate warning of patient and all infused fluids and blood. The Emergency Blood Release Form for the medical record will require only one signature.

6.5. **Termination of MTP:**

6.5.1. **Physician Responsibility**

6.5.1.1. Initiating physician should immediately notify Blood Bank to halt further efforts upon death or stabilization of the patient.

6.5.1.2. Surviving patient should be observed for signs of transfusion reaction on succeeding days (oliguria, hemolysis hemoglobinuria, fever, eosinophilia, cardiovascular instability, etc.).

6.5.1.3. Physician must assure that all unused blood products are returned immediately to Blood Bank.

6.5.2. **Blood Bank Responsibilities**

6.5.2.1. Halt MTP pack processing, thawing of FFP, and delivery of products from the Blood Bank.

6.5.2.2. Crossmatching should be done for further transfusion requirement after cessation of the MTP.

6.5.3. **Nursing Responsibilities**

6.5.3.1. Discontinue blood transfusion as ordered.
6.5.3.2. Record continuing vital signs as required for all surviving patients.

7. REFERENCES

7.1. aaBB Technical Manual 17th ed Bethesda ,MD 20814-2749 ISBN-978-1-56395-315-6
7.2. aaBB Guidelines for Massive Transfusion Bethesda ,MD 20814-2749 ISBN NO. 1-56395-199-1

8. APPENDICES

8.1. Emergency Blood Release Form 4-2-1007-08-001
8.2. MTP Flow Charts

9. ORIGINATING DEPARTMENT/S

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