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Area	Pediatric Trauma
Applicability	Tennessee Hospitals ONLY

Pediatric Trauma Massive Transfusion Protocol (PTMTP)

1. Policy Statement

To provide guidelines for facilitating and coordinating the timely and adequate replacement of massive blood loss with appropriate blood components for pediatric patients.

2. Who Should Read This Policy?

Pediatric Trauma Surgeons, Pediatric Nursing Staff, EROC Staff, Pediatric OR staff, Critical Care Nurse Clinicians, Blood Bank Staff, Lab Staff,

3. Purpose

Indications for Activation

A. Ongoing or imminent severe blood loss equal to or greater than 40ml/kg within 4 hours. Large volume blood loss does not have to occur before PTMTP can be initiated.

B. Conditions associated with the need for massive transfusion include trauma patients with chest or abdominal, amputations, and/or unstable pelvic fractures.

4. Definitions

PTMTP – Pediatric Trauma Massive Transfusion Protocol, CCNC – Critical Care Nurse Clinician,

5. The Policy

A. Initiation of Pediatric Trauma Massive Transfusion Protocol (PTMTP): Only the attending physician or senior resident directly involved in the care or the patient may initiate this protocol. The attending physician has the authority to override the protocol in life or death situations. It may only be activated in the following areas: Pediatric Emergency Department, Pediatric Operating Room, and the Pediatric Critical Care Unit.

B. To initiate PTMTP, call #7789 (Rapid Response Line) and tell the EROC staff to initiate a Pediatric

Trauma Massive Transfusion Protocol, state the age, gender, weight, and location of the patient. This page will be sent to the Blood Bank, CCNC, (Critical Care Nurse Clinician or "Red Shirt"), OR, Anesthesia, and the Children's House Supervisor. The CCNC will respond and administer the MTP in all areas of the hospital when available.

C. The Pediatric Massive Transfusion Protocol order will be placed in EPIC by the primary nurse for the patient.

D. Initial Labs: It's important to promptly collect a Blood Bank Sample for patients who meet PTMTP criteria, one pink top tube or two microtainer/bullets are drawn. Tubes will be labeled with typnex labels per policy. Specimen should be drawn as soon as possible and sent to Blood Bank to avoid unnecessary use of Group O blood products.

E. Upon activation of the PTMTP, the Charge Nurse of the activating department will be responsible for designating a blood courier. The duty will pass to the receiving departments if the patient is transported to different locations after activation.

F. Administration Schedule: Blood Bank will prepare the following cycles using the provided patient weight, releasing only full cycles unless specified by the attending or the senior resident.

   I. MTP with Whole Blood Use (Patient must be equal to or greater than 3 years old or greater than 15 kg whichever is lower)

      a. Cycle 1: Whole Blood

      b. Cycle 2: PRBC and Plasma (dosages per weight below)

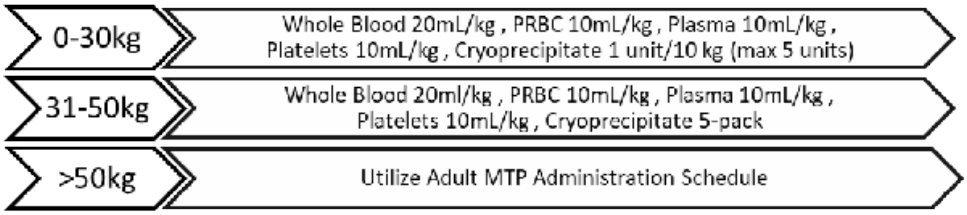
      c. Cycle 3: PRBC, Plasma, Platelets, and cryoprecipitate (dosages per weight below)

   II. MTP without Whole Blood Use

      a. Cycle 1: PRBC, Plasma, and Platelets (dosages per weight below)

      b. Cycle 2: PRBC, Plasma, (dosages per weight below)

      c. Cycle 3: PRBC, Plasma, Platelets, and Cryoprecipitate (dosages per weight below)



Blood Bank Cooler Preparation Recommendations:
Estimated batch release per cycle:
0-50 kg: 2-unit whole blood or 2 unit PRBC, 2 unit FFP, Every other cycle, 1 bag platelets and 1 pooled cryoprecipitate (5 pack).
Greater than 50 kg: Utilize the Adult MTP Administration schedule

G. Notes on Whole Blood Use, Uncrossed Blood Transfusion, and Cryo Substitute

   I. Uncrossed O- Use: Females of childbearing age (0- 45 years of age) or capacity and males < 15 years old.

   II. Uncrossed O+ Use: Females NOT of childbearing capacity (and or greater than 45 years)

and males greater than or equal to 15 years old.

III. Whole Blood Use: Will only be used for patient greater than or equal to 3 years old. If the patient is < 3 years old or whole blood is unavailable, use the MTP without Whole Blood Use Administration Schedule.

IV. Cryo Substitute: Fibryga will be utilized if no cryoprecipitate is available and will be obtained from Pharmacy.

Weight	Fibryga Dose
< 5 kg	500 mg (0.5 vial)
5.1- 15 kg	1000 mg (1 vial)
15.1 – 30 kg	2000 mg (2 vials)
Over 31 kg (adult dose)	3000 mg (3 vials)

H. If after cycle 3 the patient continues to require PTMTP, cycles 2 and 3 will be alternated until PTMTP is discontinued. PRBC and plasma should be transfused in a 1:1 ratio for a balances resuscitation.

I. The Charge Nurse of the unit/department where the patient is located will be responsible for designating a blood courier. The courier will take a completed blood pickup ticket to obtain the cooler of blood products from Blood Bank.

J. The CCNC will track the amount of different products transfused on the MTP form. They are responsible for returning completed emergency blood request forms, coolers, and unused blood products to the Blood Bank in a timely manner at the conclusion of the PTMTP. The CCNC will also complete and scan documentation and consent for the pediatric massive transfusion protocol into EPIC.

K. Warming measures will be initiated on any patient on PTMTP. Whole blood, PRBC, and FFP will be transfused through a warming device.

L. Tranexamic acid and Factor VII may be given per attending physician discretion.
Tranexamic Acid Dosing Recommendations listed below:

Trauma, hemorrhagic (acute traumatic coagulopathy):
Children <12 years: IV: Loading dose: 15 mg/kg over 10 minutes given within 3 hours of injury (maximum dose: 1,000 mg/dose), followed by continuous IV infusion at 2 mg/kg/hour for ≥8 hours or until bleeding stops.
Children ≥12 years and Adolescents: IV: Loading dose: 1,000 mg over 10 minutes given within 3 hours of injury, followed by 1,000 mg infused over 8 hours

M. In each cycle, calcium will be given after Whole Blood or PRBC cycles or as indicated by lab values.

I. Calcium Chloride: Central line infusion only: 10-20 mg/kg over 3-5 minutes OR

II. Calcium Gluconate: Central or peripheral infusion: 50-100 mg/kg over 3-5 minutes

N. The nurse in charge of the patient is responsible for communicating any lab results to the trauma surgeon or senior resident in charge of the case immediately.

O. CBC, PT/INR, PTT, fibrinogen, and ionized calcium will be drawn upon completion of the massive blood resuscitation. No routine labs should be done until the source of bleeding has been definitively controlled, with the exception of ABG's and iStats run by resuscitative personnel. TEG per physician discretion.

P. The Massive transfusion protocol can be discontinued at any time calling the Blood Bank (778-7265) at the discretion of the attending or senior resident who activated the MTP.

References:

ACS TQIP massive transfusion in trauma guidelines. (2015, April 16). Retrieved May 31, 2021, from https://www.facs.org/-/media/files/quality-programs/trauma/tqip/transfusion_guildelines.ashx

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Maw, G, Furyk C. Pediatric massive transfusion; a systematic review. Pediatric Emergency Care 2018; 8: 594-598

Beno 2014; Royal College of Pediatrics and Child Health 2012.

Approval Signatures

Step Description	Approver	Date

Applicability

Erlanger Health - Baroness, Erlanger Health - Bledsoe, Erlanger Health - Children's, Erlanger Health - East, Erlanger Health - North, Erlanger Health - System