

## PURPOSE

Massive transfusion in the pediatrics is an uncommon occurrence and the clinical scenarios requiring such support are often critical. The use of massive transfusion protocols (MTPs) has been recommended to ensure a standardized response and management. MTPs also facilitate prompt communication between different departments so that a coordinated approach to patient care can be achieved.

## POLICY STATEMENTS

The pediatric MTP may be activated at the discretion of the attending physician for infants and children who present with acute blood loss and are expected to require a massive transfusion. Blood products (red cells, plasma, platelets) will be issued from the Transfusion Medicine Laboratory in pre-defined amounts based on the weight category of the patient. Once hemostasis and hemodynamic stability has been achieved, the MTP will be deactivated and further transfusion decisions will be based on laboratory results.

The rationale for ratio-based transfusion strategies arises mainly from adult trauma experience, and has been used increasingly to manage adult massive transfusion. Its true benefit and the optimal ratio of blood components are uncertain, but randomized trials in adults are being performed. The evidence for ratio-based transfusion strategies in pediatric patients is much more limited, although a few centres have published their experience. A ratio-based transfusion strategy has been employed at BCCH in order to expedite blood product preparation and release for patients who are experiencing massive hemorrhage where transfusion decisions based on traditional laboratory tests may lead to delay in appropriate therapy.

## PROCEDURES

- 1) Manage patient as per Trauma protocol.
- 2) Determine if clinical situation meets criteria for activating massive transfusion protocol. If yes, follow subsequent steps.
- 3) Send STAT crossmatch specimen to the Transfusion Medicine Laboratory if not already performed
- 4) Send STAT Hb level, PT/INR, fibrinogen level if not already performed
- 5) Determine weight category of patient.
- 6) Activate massive transfusion protocol by calling the Transfusion Medicine Laboratory (local 7388). Provide patient name, MRN and patient location to the laboratory staff member.
- 7) Once blood products are received, transfuse as indicated based on clinical assessment and any available laboratory results that may be relevant. Transfusion based on a strict ratio of blood products is likely not required.
- 8) Monitor for complications of massive transfusion and treat accordingly. These include:
  - a. Hypothermia
  - b. Acidosis
  - c. Hypocalcemia
  - d. Hypomagnesemia
  - e. Hyper- or hypo-kalemia
  - f. Metabolic alkalosis

- 9) Call the Transfusion Medicine Laboratory to deactivate the massive transfusion protocol once hemostasis and hemodynamic stability due to blood loss has been achieved. Further transfusion decisions should be based on laboratory results (Hb level, platelet count and coagulation testing results).
- 10) Return unused blood products to the Transfusion Medicine Laboratory.
- 11) Monitor patient for additional transfusion reactions or complications of massive transfusion which may not be apparent during the initial resuscitation. Pulmonary complications have been reported for frequently in patients who have been managed with ratio based transfusion strategies.

## REFERENCES