

BLOOD COMPONENT / BLOOD PRODUCT USE DURING A MASSIVE TRANSFUSION



IDENTIFY AND TREAT ACTIVE BLEEDING
(Obstetrical, Surgical, Trauma, Medical)

STABILIZE AND TRANSPORT TO REFERRAL CENTRE
Care should be initiated within the resources and capabilities of the sending institution, which will vary depending on the hospital.

ACTIVATE MTP if patient is bleeding with anticipation of ongoing blood loss or bleeding requiring at least four (4) units of RBCs (adults) or 40 mL/kg (children) in four (4) hours.

- Establish or assign patient identification
- If the patient is transferred to another facility, the MTP will need to be activated in the second facility.

CALL BLOOD TRANSFUSION SERVICE/BLOOD BANK (BTS/BB) TO ACTIVATE MTP

- Provide contact information of physician leading the MTP
- Provide patient information
- BTS will notify the BTS/BB Medical Director as appropriate

MEDICAL-SURGICAL INTERVENTIONS

- Prior to initiation of treatment, send STAT:
 - CBC, INR/PTT, Fibrinogen, Electrolytes, Creatinine, Mg⁺⁺, Ionized Ca⁺⁺, serum lactate, Group and Screen, Blood Gas (blood work done based on facility's capabilities)
- Consider cell salvage
- Warm all fluids
- Perform surgical/interventional radiology interventions as appropriate
- If treatment is within 3 hours of injury, consider tranexamic acid - 1 gram IV over 10 minutes followed by 1 gram IV over 8 hours.
- Anticoagulant reversal
 - Oral vitamin K₁ antagonists - (e.g. Warfarin/Acencoumarol)
 - INR 1.7 to 5.0 - PCC 40 mL IV and vitamin K₁ (Phytonadione) 10 mg IV
 - INR ≥ 5.1 or Intracranial Hemorrhage or unknown INR
 - PCC 80 mL IV and vitamin K₁ (Phytonadione) 10 mg IV
 - Heparin - Protamine 1 mg IV for every 100 units of Heparin
 - Direct thrombin inhibitors/direct factor Xa inhibitors (Apixaban/Dabigatran/Rivaroxaban) - no known antidote. Replace fluid loss with appropriate fluid replacement. Transfuse RBCs, plasma and/or platelets as needed. **Plasma will not reverse the anticoagulant effects of these drugs.**

INITIAL TRANSFUSION MANAGEMENT

- ADULTS:**
- RBCs 6 units and Plasma 1500 mL and Platelets* 1 adult dose
- PEDIATRICS:**
- RBC 15 mL/kg and Plasma 10-15 mL/kg and Platelets* 5-10 mL/kg
- *In hospitals where platelets are not inventoried and the patient will be managed on site, consider requesting platelets from CBS.

MAINTAIN

- Hemoglobin above 70 g/L with RBCs:
 - Adults: 2-10 units
 - Pediatrics: 15 mL/kg
- Platelet count above 75x 10⁹/L OR above 100 x 10⁹/L (CNS injury) with Platelets:
 - Adults: 1 adult dose
 - Pediatrics: 5-10 mL/kg
- INR below 1.7 with Plasma:
 - Adults: 500-1500 mL
 - Pediatrics: 10-15 mL/kg
- Fibrinogen above 1.5 g/L with Cryoprecipitate:
 - Adults: 10 units
 - Pediatrics: 1 unit/10 kg

MAINTAIN

- Ionized calcium greater than 1.13 mmol/L
- Urine output greater than 0.5 mL/kg/h
- Systolic blood pressure greater than 70 mmHg
- Temperature greater than 35°C
- pH greater than 7.10

REASSESS

- CBC, INR/PTT, fibrinogen, blood chemistries as appropriate

CONSIDER DISCONTINUING BLOOD COMPONENT THERAPY WHEN

- Shock has resolved
 - Bleeding is under control
- Inform BTS when MTP is terminated

FOR ONGOING BLEEDING

- Reassess for the source of bleeding
- Repeat blood components based on lab results and in consultation with BTS, consider other Prohemostatic Drugs:
 - DDAVP
 - Adults: 10.0 mcg/m² IV
 - Pediatrics: 0.3 mcg/kg (max 20 mcg)

rFVIIa WARNING

rFVIIa should only be considered in rare circumstances *after* all other measures have been carried out and there is a likelihood the patient will survive.

- rFVIIa dosing is 0.020 – 0.050 mg/kg IV Direct