

**Massive Hemorrhage Protocol (Obstetrical, Surgical, Trauma, Medical)**  
**Red Deer Regional Hospital Centre**

**Initial measures**

- Intravenous access (2 large bore IVs)
- Crystalloid as per attending physician
- **Type and Screen, CBC, PT/INR, PTT, Fibrinogen, electrolytes, ionized calcium**
- Aggressive re-warming, Use blood warmer
- Continuous clinical monitoring to assess adequate response to therapy indicated by restoration of vital signs, urine output and normalization of acid/base status
- Consider surgery, angiographic embolization and endoscopy
- **Repeat PT/INR, PTT, Fibrinogen and CBC q 60 min**

**Appropriate Conventional Medical Interventions**

- Admit patient to an acute monitored bed
- Venous access with volume replacement
- Prevent and reverse hypothermia
- Prevent and reverse acidosis with bicarb
- Correct coagulopathies
- Heparin reversal (protamine 1 mg IV/100 units of heparin)
- Warfarin reversal (Vitamin K 10 mg IV, Prothrombin Complex (Octaplex® or Beriplex) 40 mL)
- Direct Oral Anticoagulant Agent reversal see DOAC Practice Support Guideline
- Monitor Calcium consider: Calcium Chloride (CaCl) 1 g IV slowly

**Criteria met for Massive Transfusion (MT)**

- 4 or more units of RBC's within one hour with ongoing losses **OR**
- More than 6 units RBC's in one bleeding episode with anticipated/ongoing losses

**Call** Transfusion Medicine (TM) at Local 4827 and notify of:

**"Massive Transfusion"**, Clinical type (e.g. Trauma) and Location (e.g. OR)

**Action:** TM will thaw 1000 mL of Frozen Plasma unless other orders received

**Red Cells**

**Goal:** Maintain hemoglobin at 100 g/L or higher  
 Order PRBC – **4 to 6 units to start**  
 Transfuse group O blood until type specific ready (If possible, use O neg for women under age 50)  
 Switch to type specific blood ASAP (dependent on inventory)

**Frozen Plasma (FP)**

**Goal:** Maintain INR less than 1.5 or good microvascular hemostasis  
 Initial adult dose is **1000 mL (based on 15 mL/Kg)**  
 Requires 25 – 30 minutes to thaw and issue

**Platelets**

**Goal:** Maintain platelet count greater than 50 x 10<sup>9</sup>/L  
 Request **one dose of pooled platelets** (equivalent to 5 single donor platelets)  
**Note:** Only two doses of platelets stocked at RDRHC, if additional platelets required, they will need to be ordered from CBS-Edmonton

**Cryoprecipitate**

**Goal:** Maintain fibrinogen greater than 1.50 g/L  
 If fibrinogen less than 1.50 g/L and INR greater than 1.5 transfuse FP, consider cryoprecipitate  
 Transfuse cryoprecipitate if fibrinogen is less than 1.50 g/L and INR is less than 1.5. Adult dose is **10 units (1 unit/10 kg of body weight)**  
 Requires 20 – 30 minutes to thaw, pool and issue  
 For obstetrical MT fibrinogen replacement should be more aggressive (goal Fibrinogen greater than 2.00 g/L)

**Monitor progress**

Repeat CBC, PT/INR, PTT, Fibrinogen **every 60 minutes** or sooner depending on clinical situation

Send all blood work STAT

Clinical assessment of response to resuscitation

**Consider adjunctive hemostatic measures**

(Available from Pharmacy)

Tranexamic acid 1 g IV bolus (if not already administered) Followed by 1g IV infused over 8 hours

Desmopressin Acetate (DDAVP) 0.3 mcg/kg IV x 1 dose for Chronic Renal Failure and Von Willebrand's Disease

Bleeding slowed

Ongoing bleeding

**Stop transfusion therapies when:**

Hemoglobin 71 – 99 g/L  
 INR less than 1.5  
 Platelets greater than 50 x 10<sup>9</sup>/L  
 Fibrinogen greater than 1.50 g/L or greater than 2.00 g/L for obstetrical MT

**Or** Resolution of shock **and** no clinical oozing

**Notify Transfusion Medicine** at 4827 & return any unused blood products ASAP.

**Notify Transfusion Medicine at 4827**

Repeat CBC, PT/INR, PTT & Fibrinogen Q 60 min. –Consider repeat ionized Ca and K+

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(Authorized individuals are: lab personnel designated in their zone/program or provincial role to produce print copies)