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

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 10^9/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 1.00 G/L
If fibrinogen less than 1.00 G/L and INR greater than 1.5 transfuse FP, consider cryoprecipitate
Transfuse cryoprecipitate if fibrinogen is less than 1.00 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

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

Consider adjunctive hemostatic measures
(Available from Pharmacy)
- Tranexamic acid
- 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 10^9/L
- Fibrinogen greater than 1.00 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.