Blood Transfusion Guidelines in Massive Obstetric Hemorrhage

Source: Harvey, CJ and Dildy, G. (in press) Massive Postpartum Hemorrahge (chpt), in Troiano, N., Harvey, C., Chez, B. (Editors) AWHONN's High Risk and Critical Care Obstetrics, 3rd Edition, LWW, Inc.: Philadelphia.

Parameter	Actions	Comments
• Hemorrhage suspected	• Early diagnosis of possible hemorrhage • *Early move of patient to OR* • Communicate emergency to hemorrhage team	• Notify anesthesia stat on transfer to OR • Anesthesia monitoring per ASA standards
• Volume resuscitation with crystalloids until blood products (O-neg) available	• Start IV access in both arms; use 14G catheters over needles. • Place CVC with multi-lumens with large diameters (ex: 14G, 16G, and 18G in triple lumen); Or, place CVC/PAC introducer • Request O D-negative blood from blood bank (4 units now and prepare packs of 4 to send until crossmatched blood is ready) • Request BB to start thawing all frozen products for the "OB Hemorrhage Pack"	• There is no benefit of colloids over crystalloids for volume resuscitation • Give pre-warmed fluids • Use normal saline (0.9% NaCl) without glucose • Do not delay initial transfusion due to lack of crossmatched blood if patient hemorrhaging

• Send type and crossmatch
• Assess Hgb/Hct and coagulation profile
• Order "OB Hemorrhage Pack"
  • 8 units PRBCs
  • 6 to 8 units FFP
  • 2 platelet aphaeresis packs
  • 2 cryoprecipitate doses
	• Draw two to three tubes of blood for type and crossmatch
	• Draw additional blood and send for CBC, DIC Profile (PT, PTT, platelets, fibrinogen, FDP and/or D-dimer), Chemistry, (electrolytes)
		• Blood bank needs several tubes of blood to type and cross larger volumes of blood products
		• Create proactive plan for ordering blood (i.e., BB continues to prepare and send blood products in the same sequence as initial orders unless notified).

• Maintain Hgb >8 g/dL • Transfuse to goal of 10 g/dL (provides margin of safety)	• Transfuse PRBCs and FFP simultaneously or by altering 1 unit of PRBC and then 1 unit FFP, ongoing basis • If blood not available, request and transfuse Group O D negative (begin with 4 units) • 1 unit of PRBC increases Hgb 1 g/dL (ex: Hgb 5, transfuse at least 3 units to correct for stable patient) • If patient bleeding, add significantly more units for continuing blood loss • 2-person check for "right patient – right blood" • Use blood warmer, blood filter from blood bank, blood tubing • May use pressure bags with PRBC and FFP • Use 0.9% NaCl as mainline solutions to run PRBCs • Use Rapid Volume Infuser if available • Notify Cell-Saver operator/team	• Continue to use O-negative; then ABO group specific when blood group identified by blood bank • Do not delay initial transfusion due to lack of crossmatched blood if patient hemorrhaging • Blood bank to auto send blood when crossmatch complete • Number 1 reason for blood transfusion reactions – patient receives wrong blood. Confirm pt ID with 2 identifiers, armband, witness, use standardized guidelines. • Assign extra RNs (usually 2) to witness blood in OR if any delay occurs in transfusion • Continue to send BB tubes of blood as requested for ongoing crossmatching • Replace blood filters every 2 units PRBCs or per BB policy • Do NOT use lactated ringers or any solution with calcium
• Maintain platelets >75,000 • Transfuse to 100,000 as goal (provides margin of safety)	• Transfuse platelet apharesis large pack • Anticipate platelets <50,000 after 2x blood volume loss • One unit platelet aphaeresis increases platelet count 35,000 to 50,000.	• Anticipate large percentage of platelets rendered useless in transfusion. • Have second pack ready in OR. • Do NOT use pressure bags
• Maintain PT & aPTT <1.5 x control • Maintain Fibrinogen >100 mg/dL	• Transfuse FFP in 1:1 or 1:1.5 ratio to PRBCs • Anticipate need to transfuse early	• Transfuse early to prevent and/or abate DIC • Takes 30 minutes to thaw, order early • OB pt may need more than non-pregnant patient due to increased blood volume.

• Apheresis If Fibrinogen <80 mg/dL	• Transfuse cryoprecipitate	• Hemostasis no longer occurs is fibrinogen <75 mg/dL. • Critically low fibrinogen level likely reached when 1.5x blood volume lost. • 4 units FFP increase fibrinogen 200–500 mg/L (volume = 1,000 mL or 1 liter) • 2 pools of cryoprecipitate increase fibrinogen 320-400 mg/L (volume = 150 to 200 mL); complete dose can be administered more rapidly than fibrinogen equivalent
• If DIC present, blood products ineffective, evaluate pt for undiagnosed von Willebrand Factor deficiency. If this congenital bleeding disorder known, administer DDAVP (Medscape)	• Transfuse Desmopressin (DDAVP) • Dose 0.3 ug/kg • Limit repeat doses to every 6 to 8 hours	• DDAVP promotes release of von Willebrand's Factor from vascular endothelium. • Improves hemostasis in healthy volunteers and patients with disorders related to aspirin, NSAIDs, cirrhosis; but, its effect in massive hemorrhage is unknown.
• If DIC present, blood products ineffective, patient unstable – Recombinant Factor VIIa (rVIIa)	• Give Recombinant Factor VIIa (rVIIa) • 90 ug/kg (dose not standardized). (NovoSeven® Coagulation Factor VIIa (Recombinant), Novo Nordisk Health Care AG, USA.)	• FDA off label use has been reported in OB literature. Side effects may include thrombosis and its sequelae. • Dose supplied in kit form – reconstitute prior to administration. May need two vials per dose – based on patients weight • Repeat the dose of rVIIa 2 hours after first dose.

Table adapted from:

British Committee for Standards in Haematology, Stainsby D, MacLennan S, Thomas D, Isaac J, Hamilton PJ. Guidelines on the management of massive blood loss. Br J Haematol 2006 Dec;135(5):634-41.

American Society of Anesthesiologists (2006). Practice Guidelines for Perioperative Blood Transfusion and Adjuvant Therapies -An Updated Report by the American Society of Anesthesiologists Task Force on Perioperative Blood Transfusion and Adjuvant Therapies. Anesthesiology 105:198–208.

Medscape: Medical Management of Bleeding in Critically Ill Patients. Saxon Ridley, MD FRCA; B. Taylor, BSc FRCA FFANZCA FJFICM; K. Gunning, MBBS MA FRCS FRCA. Published: 10/08/2007. Accessed from: http://www.medscape.com/viewarticle/563820_3