Appendix B: Obstetric Hemorrhage Care Guidelines: Checklist Format

Prenatal Assessment & Planning

- ☐ Evaluate for risk factors prenatally and **identify/prepare for patients with special considerations:** Placenta previa/accreta, bleeding disorder, or those who decline blood products
  - ☐ **Screen and aggressively treat severe anemia:** if oral iron fails, initiate "IV Iron Protocol" to reach optimal Hgb/Hct, especially for at risk patients
  - ☐ Provide counseling/education
  - ☐ Consider site of delivery
  - ☐ Plan for blood salvage if appropriate

Admission Assessment & Planning

Admission Hemorrhage Risk Factor Assessment

- ☐ Evaluate for risk factors on admission
- ☐ Verify type & antibody screen from prenatal record
  - ☐ If not available: Order type and screen (lab will notify if 2nd specimen needed for confirmation)
  - ☐ Send specimen to blood bank as indicated by institutional practices. ***Blood bank recommendations should be highly localized.*** *Many institutions no longer hold a specimen in the blood bank; others utilize automated technology to type and screen all obstetric patients.*
  - ☐ If prenatal or current antibody screen positive (not low-level anti-D from RhoGam)
    - ☐ Type and crossmatch 2 units PRBCs
- ☐ Identify patients who may decline blood products
  - ☐ Notify OB provider for plan of care
  - ☐ Early consult with OB anesthesia
  - ☐ Review consent form
- ☐ Ensure readiness

ADMISSION & LABOR RISK FACTORS		
MONITOR FOR HEMORRHAGE *Routine obstetric care*	NOTIFY CARE TEAM *Personnel that could be involved in response are made aware of patient status and risk factors*	NOTIFY CARE TEAM MOBILIZE RESOURCES *Consider anesthesia attendance at delivery*
Low	**Medium**	**High**
No previous uterine incision	Prior cesarean(s) or uterine surgery	Placenta previa, low lying placenta
Singleton pregnancy	Multiple gestation	Suspected/known placenta accreta spectrum
≤ 4 vaginal births	> 4 vaginal births	Abruption or active bleeding (> than show)
No known bleeding disorder	Chorioamnionitis	Known coagulopathy
No history of PPH	History of previous postpartum hemorrhage	History of > 1 postpartum hemorrhage
	Large uterine fibroids	HELLP Syndrome
	Platelets 50,000 - 100,000	Platelets < 50,000
	Hematocrit < 30% (Hgb < 10)	Hematocrit < 24% (Hgb < 8)
	Polyhydramnios	Fetal demise
	Gestational age < 37 weeks or > 41 weeks	2 or more medium risk factors
	Preeclampsia	
	Prolonged labor/Induction (> 24 hrs)	
If low risk: ☐ Specimen on Hold in Blood Bank	If medium risk: ☐ Order Type & Screen ☐ Review Hemorrhage Protocol	If high risk: ☐ Order Type & Crossmatch 2 units PRBCs ☐ Review Hemorrhage Protocol ☐ Notify OB Anesthesia

Stage 0: All Births – Prevention & Recognition of OB Hemorrhage

Prophylactic Oxytocin, Quantitative Cumulative Evaluation of Blood Loss & Close Monitoring

- ☐ Perform o*ngoing* risk assessment at the start of the second stage of labor, at transfer to postpartum care, and ***any time the patient's condition changes***
  - ☐ If new risk factors develop, increase risk level and convert to type and screen or type and crossmatch (see above)
- ☐ Active management of third stage
  - ☐ Oxytocin IV infusion or 10 units IM; do not give oxytocin as IV push
- ☐ Ongoing quantitative cumulative evaluation of blood loss
  - ☐ Using formal methods, such as graduated containers, visual comparisons and weight of blood-soaked materials (**1gm = 1mL**)
- ☐ Ongoing evaluation of vital signs

ADDITIONAL DELIVERY & ONGOING POSTPARTUM RISK FACTORS

Low	Medium	High
ROUTINE CARE	INCREASED SURVEILLANCE POSTPARTUM CARE TEAM ASSESSES RESPONSE READINESS	
	Cesarean birth during this admission *– especially if urgent/emergent/2nd stage*	Active bleeding soaking > 1 pad per hour or passing a ≥ 6 cm clot
	Operative vaginal delivery	Retained placenta
	Genital tract trauma including 3rd & 4th degree lacerations	Non-lower transverse uterine incision for cesarean birth
	Quantitative Cumulative Blood Loss 500-1000 mL with a vaginal delivery	Quantitative Cumulative Blood Loss ≥ 1000 mL or treated for hemorrhage
		Received general anesthesia
		Uterine rupture

Triggers to Proceed to STAGE 1:

CBL ≥ 500mL vaginal / ≥ 1000 mL cesarean with continued bleeding or Signs of concealed hemorrhage: VS abnormal or trending (HR ≥ 110, BP ≤ 85/45, O2 sat < 95%, shock index 0.9) or Confusion

STAGE 1: Activate Hemorrhage Protocol

Clinical Trigger: CBL ≥ 500 mL vaginal / ≥ 1000 mL cesarean with *continued bleeding* or Signs of concealed hemorrhage: VS abnormal or trending (HR ≥ 110, BP ≤ 85/45, O2 sat < 95%, shock index 0.9) or Confusion

MOBILIZE	ACT	THINK
Primary nurse, Physician or Midwife: ☐ Activate OB Hemorrhage Protocol and Checklist **Primary nurse:** ☐ Notify obstetrician or midwife (in-house and attending) ☐ Notify charge nurse ☐ Notify anesthesiologist **Secondary nurse:** ☐ Assist primary nurse as needed or assign staff member(s) to help	**Primary nurse or designee**: ☐ Establish IV access if not present, at least 18 gauge ☐ Increase IV oxytocin rate per hospital treatment guidelines ☐ Increase fluids ☐ Apply vigorous fundal/bi-manual massage **MOVE ON** to 2nd level uterotonic if no response (see Stage 2 meds below) ☐ Vital Signs, including O2 sat & level of consciousness (LOC) q5 minutes ☐ Record quantitative cumulative blood loss q5-15 minutes ☐ Administer oxygen to maintain O2 sat at > 95% ☐ Empty bladder: straight catheter or place Foley with urometer ☐ Convert to **high risk**: Type and Crossmatch for 2 units PRBCs STAT (where clinically appropriate if not already done) ☐ Keep patient warm **Physician or midwife:** ☐ Bimanual massage ☐ Careful inspection with good exposure: Rule out retained products of conception, laceration, hematoma **Surgeon (if intra-op)** ☐ Inspect for uncontrolled bleeding at all levels, esp. broad ligament, posterior uterus, and retained placenta	Consider potential etiology: • Uterine atony • Trauma/laceration • Retained placenta • Amniotic fluid embolism • Uterine inversion • Coagulopathy • Placenta accreta Convert to high risk and take appropriate precautions. Consider type and cross 2 units PRBCs where clinically appropriate if not already done. **Once stabilized:** Postpartum management with increased surveillance and response readiness assessment.

Triggers to Proceed to STAGE 2:
***Continued bleeding* w/ CBL < 1500 mL or VS remain abnormal**

STAGE 2: Mobilize Team and Blood Bank Support

Clinical Trigger: Continued bleeding or Vital Sign instability, and < 1500 mL cumulative blood loss

MOBILIZE	ACT	THINK

Perform duties by assigned role:
☐ Activate OB Rapid Response Team:
PHONE #:_____
 	
If not included in OB RRT:
☐ Call obstetrician or midwife to bedside
☐ Call Anesthesiologist
☐ Notify Perinatologist or 2nd OB
☐ Notify nursing supervisor
☐ Notify blood bank of hemorrhage; order products as directed
☐ Bring hemorrhage cart to the patient's location
☐ Initiate OB hemorrhage record scribing
☐ Assign single person to communicate with blood bank
☐ Assign a family support person/medical social worker per procedure
	ESTABLISH TEAM LEADERSHIP AND ASSIGN ROLES
	Administer 2nd level uterotonic medication:
	☐ **Methylergonovine** 0.2 mg IM per protocol (if not hypertensive)
	☐ If hypertensive or Methylergonovine dose ineffective: **carboprost** 250 mcg IM
	  ☐ Can repeat carboprost up to 3 times every 20 min (note: 75% respond to first dose)
	☐ ***Only*** *If hypertensive and asthmatic:* **Misoprostol** 800 mcg SL
	☐ Continue IV oxytocin and provide additional IV crystalloid solution
	☐ Administer tranexamic acid (TXA) 1 gram IV over 10 minutes – may give a second dose of 1 gm if bleeding continues after 30 minutes or if bleeding stops and then restarts within 24 hours of completing the first dose
	Team leader:
	Do not delay other interventions while waiting for response to medications (see right column - THINK)
	☐ Order labs STAT (CBC/Plts, Chem 12 panel, Coag Panel II, ABG)
	☐ Bimanual uterine massage
	☐ Vaginal Delivery: Complete evaluation of vaginal wall, cervix, placenta, uterine cavity (if not already done)
	☐ Intra-op cesarean: Inspect for uncontrolled bleeding at all levels, esp. broad ligament, posterior uterus, and retained placenta (if not already done)
	☐ Move to OR or location where higher level of care can be adequately provided
	☐ Order 2 units PRBCs and bring to the bedside - consider use of **Emergency Release** products (un-crossmatched)
	  ☐ **Transfuse PRBCs based on clinical signs** and response, do not wait for lab results; KEEP AHEAD W/ VOLUME & BLOOD PRODUCTS
	Primary nurse (or designee):
	☐ Establish 2nd large bore IV, at least 18 gauge
	☐ Assess and announce Vital Signs and quantitative cumulative blood loss q5-15 minutes
	☐ Set up blood administration set and blood warmer for transfusion
	☐ Administer meds, blood products and draw labs, as ordered
	☐ Keep patient warm
	Second nurse:
	☐ Obtain hemorrhage cart if not already in the room
	☐ Obtain portable light
	☐ Place Foley with urometer (if not already done)
	☐ Obtain blood products from the blood bank (or send designee)
	☐ Assist with move to OR or higher level of care (if indicated)
	Blood Bank:
	☐ Prepare to activate massive transfusion protocol if needed
		Sequentially advance through procedures and other interventions based on etiology:
		Vaginal birth
		If **trauma** (vaginal, cervical or uterine):
		• Visualize and repair
		If **retained placenta**:
		• D&C
		If **uterine atony** or lower uterine segment bleeding:
		• Intrauterine balloon
		Intra-op C-section:
		• Uterine suture
		• Intrauterine balloon
		• Uterine artery ligation
		If **uterine inversion**:
		• Anesthesia and uterine relaxation drugs for manual reduction
		If **amniotic fluid embolism**:
		• Maximally aggressive respiratory, vasopressor and blood product support
		If **vital signs derangement inconsistent with measured blood loss consider concealed hemorrhage**: lower uterine genital tract hematoma with extension; uterine rupture, broad ligament laceration; or other source of internal bleeding; **move to laparotomy.**
		Consider activating MTP if there is continued bleeding.
		Once stabilized: Postpartum management with increased surveillance and response readiness assessment.

Re-Evaluate Bleeding and Vital Signs

Triggers to Proceed to STAGE 3:

Continued bleeding **with CBL > 1500mL or > 2 units PRBCs given or abnormal VS or suspicion of DIC**

STAGE 3: Initiate Massive Transfusion Protocol & Surgical Approaches

Clinical Trigger: *Continued bleeding* with CBL > 1500mL or > 2 units PRBCs given or abnormal VS or suspicion of DIC

MOBILIZE

Perform duties by assigned role:

☐ **Activate Massive Transfusion Protocol**

PHONE #:_____

Ensure additional team experts available.

Examples:

☐ Advanced Gyn surgeon (e.g., Gyn Oncologist)
☐ Second anesthesiologist
☐ Main OR staff
☐ Adult intensivist
☐ Supervisor, CNS, or manager
☐ **Reassign staff as needed**
☐ If considering selective embolization, call-in Interventional Radiology team and second anesthesiologist

Blood Bank:

☐ **Prepare to issue additional blood products as needed in accordance with MTP –** stay ahead
☐ If patient at risk for multiorgan failure or residual coagulopathy **– contact ICU regarding transfer.**
☐ Continue family support

ACT

Reidentify team leadership and micro brief with additional team members

Team leader:

☐ **Order Massive Transfusion Pack**
☐ (PRBCs + FFP + 1 pheresis pack Plts—see note in right column)
☐ **Move to OR** if not already there
☐ Repeat CBC/Plts, Coag Panel II STAT and Chem 12 panel q30-60 min
☐ Repeat ABGs
☐ Consider cell saver if preplanned or immediately available; notify transfusionist

Anesthesiologist (as indicated):

☐ Ongoing monitoring of VS *and communication to team*
☐ Arterial blood gases
☐ Consider central hemodynamic monitoring
☐ CVP or PA line
☐ Arterial line
☐ Vasopressor support
☐ Intubation
☐ Calcium replacement
☐ Electrolyte monitoring
☐ Ensure large bore IV for transfusion

Primary nurse:

☐ Announce cumulative quantitative blood loss q5-10 minutes
☐ Apply upper body warming blanket
☐ Use fluid warmer and/or rapid infuser for fluid & blood product administration
☐ Apply sequential compression stockings to lower extremities
☐ Circulate in OR

Second nurse and/or anesthesiologist:

☐ Continue to administer meds, blood products and draw labs as ordered

Third Nurse:

☐ Recorder

THINK

Interventions based on etiology not yet completed

Prevent hypothermia, acidemia

Conservative or Definitive Surgery:

- Uterine sutures
- Uterine artery ligation
- Hysterectomy

For Resuscitation:

Aggressively Transfuse

Based on Vital Signs, Blood Loss

After the first 2 units of PRBCs use

Near equal FFP and PRBC for massive hemorrhage:

1 PRBC to 1 FFP

1 platelet apheresis pack per 4-6 units PRBCs

If **above measures unproductive:** Interventional Radiology (IR) for selective embolization as appropriate if patient stable for transport and team *immediately available* - physician who is able to immediately call for and move to surgery should be in house.

Unresponsive Coagulopathy:

- Role of rFactor VIIa is very controversial. After 8-10 units PRBCs and coagulation factor replacement with ongoing hemorrhage, may consider risk/benefit of rFactor VIIa in consultation with hematologist or trauma surgeon

Once Stabilized: Modified postpartum management with increased surveillance; consider ICU

Postpartum
If patient is: Status post hemorrhage and at risk for multi-organ failure: ☐ Admit to ICU or location for advanced care and continue MTP Stable for transition to postpartum care after experiencing hemorrhage: ☐ Perform risk assessment on transfer to postpartum care considering all prenatal, delivery and immediate postpartum factors ☐ Provide increased surveillance and ensure adequate response readiness is in place Stable for admission to postpartum post-delivery: ☐ Perform risk assessment on transfer to postpartum care considering all prenatal, delivery and immediate postpartum factors ☐ Provide routine care or increased surveillance and ensure adequate response readiness is in place based on risk assessment

BLOOD PRODUCTS	
Packed Red Blood Cells (PRBC) Approx. 35-40 min. for crossmatch—once sample is in the lab and assuming no antibodies present	Best first-line product for blood loss 1 unit = 200 mL volume If antibody positive, may take hours to days for crossmatch. In some cases, such as autoantibody crossmatch compatible may not be possible. Use “least incompatible” in urgent situations.
Fresh Frozen Plasma (FFP) Approx. 35-45 minutes to thaw for release	Highly desired if > 2 units PRBCs given, or for prolonged PT, PTT 1 unit = 180 mL volume
Platelets (Plts) Local variation in time to release (may need to come from regional blood bank)	Priority for women with Platelets < 50,000 Single-donor apheresis unit (= 6 units of platelet concentrates) provides 40-50,000 transient increase in platelets
Cryoprecipitate (Cryo) Approx. 35-45 minutes to thaw for release	Priority for women with Fibrinogen levels < 80 10-unit pack (or 1 adult dose) raises Fibrinogen 80-100 mg/dL Best for DIC with low fibrinogen and where volume replacement is not needed. Caution: 10 units come from 10 different donors, so infection risk is proportionate.

This table was adapted from the Improving Health Care Response to Obstetric Hemorrhage: A California Quality Improvement Toolkit, funded by the California Department of Public Health, 2015; supported by Title V funds.