**Obstetric Hemorrhage Care Guidelines: Checklist Format**

**Prenatal Assessment & Planning**

- **Identify and 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 Sucrose Protocol to reach desired Hgb/Hct, especially for at risk mothers.

**Admission Assessment & Planning**

- **Verify Type & Antibody Screen** from prenatal record
  - **If not available,**
    - Order Type & Screen (lab will notify if 2nd clot needed for confirmation)
  - **If prenatal or current antibody screen positive (if not low level anti-D from Rho-GAM),**
    - Type & Crossmatch 2 units PRBCs
- **All other patients,**
  - Send Clot to blood bank

- Evaluate for **Risk Factors** (see below)
  - **If medium risk:**
    - Order Type & Screen
    - Review Hemorrhage Protocol
  - **If high risk:**
    - Order Type & Crossmatch 2 units PRBCs
    - Review Hemorrhage Protocol
    - Notify OB Anesthesia

- **Identify** women who may decline transfusion
  - Notify OB provider for plan of care
  - Early consult with OB anesthesia
  - Review Consent Form

- **Ongoing Risk Assessment**
  - **Evaluate for development of additional risk factors in labor:**
    - Prolonged 2nd Stage labor
    - Prolonged oxytocin use
    - Active bleeding
    - Chorioamnionitis
    - Magnesium sulfate treatment
  - **Increase Risk level** (see below) and convert to Type & Screen or Type & Crossmatch
  - **Treat multiple risk factors as High Risk**

**Admission Hemorrhage Risk Factor Evaluation**

<table>
<thead>
<tr>
<th>Low (Clot only)</th>
<th>Medium (Type and Screen)</th>
<th>High (Type and Crossmatch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No previous uterine incision</td>
<td>Prior cesarean birth(s) or uterine surgery</td>
<td>Placenta previa, low lying placenta</td>
</tr>
<tr>
<td>Singleton pregnancy</td>
<td>Multiple gestation</td>
<td>Suspected Placenta accreta or percreta</td>
</tr>
<tr>
<td>≤4 previous vaginal births</td>
<td>&gt;4 previous vaginal births</td>
<td>Hematocrit &lt;30 AND other risk factors</td>
</tr>
<tr>
<td>No known bleeding disorder</td>
<td>Chorioamnionitis</td>
<td>Platelets &lt;100,000</td>
</tr>
<tr>
<td>No history of PPH</td>
<td>History of previous PPH</td>
<td>Active bleeding (greater than show) on admit</td>
</tr>
<tr>
<td>Large uterine fibroids</td>
<td>Estimated fetal weight greater than 4 kg</td>
<td>Known coagulopathy</td>
</tr>
<tr>
<td>Morbid obesity (BMI &gt;35)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**STAGE 0: All Births: Prevention & Recognition of OB Hemorrhage**

**Active Management of Third Stage**
- Oxytocin infusion: 10-20 units oxytocin/1000ml solution titrate infusion rate to uterine tone; or 10 units IM; do not give oxytocin as IV push
- Vigorous **fundal** massage for at least 15 seconds

**Ongoing Quantitative 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**

- **If:** Cumulative Blood Loss >500ml vaginal birth or >1000ml C/S -OR- Vital signs >15% change or HR ≥110, BP ≤85/45, O2 sat <95% -OR- Increased bleeding during recovery or postpartum,
  - **proceed to STAGE 1**
**STAGE 1: OB Hemorrhage**

**Cumulative Blood Loss**: >500 ml vaginal birth or >1000 ml C/S - OR - Vital signs >15% change or HR ≥ 110, BP ≤ 85/45, O2 sat <95% - OR - Increased bleeding during recovery or postpartum

<table>
<thead>
<tr>
<th>MOBILIZE</th>
<th>ACT</th>
<th>THINK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary nurse, Physician or Midwife to:</td>
<td>Primary nurse:</td>
<td>Consider potential etiology:</td>
</tr>
<tr>
<td>☐ Activate OB Hemorrhage Protocol and Checklist</td>
<td>☐ Establish IV access if not present, at least 18 gauge</td>
<td>• Uterine atony</td>
</tr>
<tr>
<td>☐ Notify obstetrician (in-house and attending)</td>
<td>☐ Increase IV fluids rates (Lactated Ringers preferred) and increase Oxytocin rate (500 mL/hour of 10-40 units/1000mL solution); Titrate Oxytocin infusion rate to uterine tone</td>
<td>• Trauma/Laceration</td>
</tr>
<tr>
<td>☐ Notify charge nurse</td>
<td>☐ Continue vigorous fundal massage</td>
<td>• Retained placenta</td>
</tr>
<tr>
<td>☐ Notify anesthesiologist</td>
<td>☐ Administer Methergine 0.2 mg IM per protocol (if not hypertensive); give once, if no response, move to alternate agent; if good response, may give additional doses q 2 hr</td>
<td>• Amniotic Fluid Embolism</td>
</tr>
<tr>
<td></td>
<td>☐ Vital Signs, including O2 sat &amp; level of consciousness (LOC) q 5 minutes</td>
<td>• Uterine Inversion</td>
</tr>
<tr>
<td></td>
<td>☐ Weigh materials, calculate and record cumulative blood loss q 5-15 minutes</td>
<td>• Coagulopathy</td>
</tr>
<tr>
<td></td>
<td>☐ Empty bladder: straight cath or place Foley with urimeter</td>
<td>• Placenta Accreta</td>
</tr>
<tr>
<td></td>
<td>☐ Type and Cross match for 2 units Red Blood Cells STAT (if not already done)</td>
<td>• Uterine Rupture</td>
</tr>
<tr>
<td></td>
<td>☐ Keep patient warm</td>
<td>Once stabilized: Modified Postpartum management with increased surveillance</td>
</tr>
</tbody>
</table>

**Primary nurse, Physician or Midwife:**

- Rule out retained Products of Conception, laceration, hematoma

**Surgeon (if cesarean birth and still open):**

- Inspect for uncontrolled bleeding at all levels, esp. broad ligament, posterior uterus, and retained placenta

---

**UTEROTONIC AGENTS for POSTPARTUM HEMORRHAGE**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
<th>Route</th>
<th>Frequency</th>
<th>Side Effects</th>
<th>Contraindications</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitocin® (Oxytocin) 10 units/ml</td>
<td>10-40 units per 1000 ml, rate titrated to uterine tone</td>
<td>IV infusion</td>
<td>Continuous</td>
<td>Usually none Nausea, vomiting, hyponatremia (“water intoxication”) with prolonged IV admin. ↓ BP and ↑ HR with high doses, esp IV push</td>
<td>Hypersensitivity to drug</td>
<td>Room temp</td>
</tr>
<tr>
<td>Methergine® (Methylergonivine) 0.2mg/ml</td>
<td>0.2 mg</td>
<td>IM (not given IV)</td>
<td>-Q 2-4 hours -If no response after first dose, it is unlikely that additional doses will be of benefit</td>
<td>Nausea, vomiting Severe hypertension, esp. with rapid administration or in patients with HTN or PIH</td>
<td>Hypertension, PIH, Heart disease Hypersensitivity to drug Caution if multiple doses of ephedrine have been used, may exaggerate hypertensive response w/possible cerebral hemorrhage</td>
<td>Refrigerate Protect from light</td>
</tr>
<tr>
<td>Hemabate® (15-methyl PG F2a) 250mcg/ml</td>
<td>250 mcg</td>
<td>IM or intra-myometrial (not given IV)</td>
<td>-Q 15-90 min -Not to exceed 8 doses/24 hrs -If no response after 3 doses, it is unlikely that additional doses will be of benefit.</td>
<td>Nausea, vomiting, Diarrhea Fever (transient), Headache Chills, shivering Hypertension Bronchospasm</td>
<td>Caution in women with hepatic disease, asthma, hypertension, active cardiac or pulmonary disease Hypersensitivity to drug</td>
<td>Refrigerate</td>
</tr>
<tr>
<td>Cytotec® (Misoprostol) 100 or 200mcg tablets</td>
<td>800-1000mcg</td>
<td>Per rectum (PR)</td>
<td>One time</td>
<td>Nausea, vomiting, diarrhea Shivering, Fever (transient) Headache</td>
<td>Rare Known allergy to prostaglandin Hypersensitivity to drug</td>
<td>Room temp</td>
</tr>
</tbody>
</table>

If: Continued bleeding or Continued Vital Sign instability, and <1500 mL cumulative blood loss proceed to STAGE 2
### STAGE 2: OB Hemorrhage

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

<table>
<thead>
<tr>
<th>MOBILIZE</th>
<th>ACT</th>
<th>THINK</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary nurse (or charge nurse):</strong></td>
<td><strong>Team leader (OB physician):</strong></td>
<td><strong>Sequentially advance through procedures and other interventions based on etiology:</strong></td>
</tr>
<tr>
<td>□ Call obstetrician to bedside</td>
<td>□ Additional uterotonic medication: Hemabate 250 mcg IM [if not contraindicated] OR Mispoprostol 800-1000 mcg PR</td>
<td><strong>Vaginal birth</strong></td>
</tr>
<tr>
<td>□ Call Anesthesiologist</td>
<td>□ Can repeat Hemabate up to 3 times every 20 min; (note-75% respond to first dose)</td>
<td>If trauma (vaginal, cervical or uterine):</td>
</tr>
<tr>
<td>□ Notify Blood bank of hemorrhage; order products as directed</td>
<td></td>
<td>▪ Visualize and repair</td>
</tr>
<tr>
<td>□ Notify Perinatologist or 2nd OB</td>
<td><strong>Do not delay other interventions (see right column) while waiting for response to medications</strong></td>
<td><strong>If retained placenta:</strong></td>
</tr>
<tr>
<td><strong>Charge nurse:</strong></td>
<td>□ Bimanual uterine massage</td>
<td>▪ D&amp;C</td>
</tr>
<tr>
<td>□ Notify Perinatologist or 2nd OB Hemorrhage</td>
<td>□ Move to OR (if on postpartum unit, move to L&amp;D or OR)</td>
<td><strong>If uterine atony or lower uterine segment bleeding:</strong></td>
</tr>
<tr>
<td>Record</td>
<td>□ Order 2 units PRBCs and bring to the bedside</td>
<td>▪ Intraterine Balloon</td>
</tr>
<tr>
<td>□ If selective embolization, call-in Interventional Radiology Team and second anesthesiologist</td>
<td>□ Order labs STAT (CBC/Plts, Chem 12, PT/aPTT, Fibrinogen, ABG)</td>
<td><strong>If above measures unproductive:</strong></td>
</tr>
<tr>
<td>□ Notify nursing supervisor</td>
<td>□ Transfuse PRBCs based on clinical signs and response, do not wait for lab results</td>
<td>▪ Selective embolization (Interventional Radiology if available &amp; adequate experience)</td>
</tr>
<tr>
<td>□ Assign single person to communicate with blood bank</td>
<td></td>
<td><strong>C-section:</strong></td>
</tr>
<tr>
<td>□ Call medical social worker or assign other family support person</td>
<td></td>
<td>▪ Uterine hemostatic suture, e.g., B-Lynch Suture, O'Leary, Multiple Squares</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Intraterine Balloon</td>
</tr>
</tbody>
</table>

**Primary nurse:**

- Establish 2\(^{nd}\) large bore IV, at least 18 gauge. Maintain adequate fluid volume with Lactated Ringers and adequate uterine tone with oxytocin infusion
- Assess and announce Vital Signs and cumulative blood loss q 5-10 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 (or charge nurse):**

- Place Foley with urimeter (if not already done)
- Obtain portable light and OB procedure tray or Hemorrhage cart
- Obtain blood products from the Blood Bank
- Assist with move to OR (if indicated)

**Blood Bank:**

- Determine availability of thawed plasma, fresh frozen plasma, and platelets; initiate delivery of platelets if not present on-site
- Consider thawing 2 FFP (takes 30 min), use if transfusing >2 units PRBCs
- Prepare for possibility of massive hemorrhage

**Re-Evaluate Bleeding and Vital Signs**

- If cumulative blood loss >1500ml, >2 units PRBCs given, VS unstable or suspicion for DIC, proceed to STAGE 3

---

This project was supported by Title V funds received from the State of California Department of Public Health, Center for Family Health; Maternal Child and Adolescent Health Division. California Maternal Quality Care Collaborative (CMQCC): Hemorrhage Taskforce (2009) visit: [www.CMQCC.org](http://www.CMQCC.org) for details.
### MOBILIZE

**Nurse or Physician:**
- Activate Massive Hemorrhage Protocol
- PHONE #: __________

**Charge Nurse or designee:**
- Notify advanced Gyn surgeon (e.g., Gyn Oncologist)
- Notify adult intensivist
- Call-in second anesthesiologist
- Call-in OR staff
- Reassign staff as needed
- Call-in supervisor, CNS, or manager
- Continue OB Hemorrhage Record
- If transfer considered, notify ICU

**Blood Bank:**
- Prepare to issue additional blood products as needed – stay ahead

### ACT

#### Establish team leadership and assign roles

**Team leader** (OB physician + OB anesthesiologist, anesthesiologist and/or perinatologist and/or intensivist):
- Order Massive Hemorrhage Pack (RBCs + FFP + 1 pheresis pack PLTS—see note in right column)
- Move to OR if not already there
- Repeat CBC/PLTS, Chem 12, PT/aPTT, Fibrinogen, ABG STAT q 30-60 min

**Anesthesiologist** (as indicated):
- Arterial blood gases
- Central hemodynamic monitoring
- CVP or PA line
- Arterial line
- Vasopressor support
- Intubation

#### Primary nurse:
- Announce VS and cumulative measured blood loss q 5-10 minutes
- Apply upper body warming blanket if feasible
- 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 (or charge nurse):**
- Recorder

### THINK

- Selective Embolization (IR)
- Interventions based on etiology not yet completed
- Prevent hypothermia, Acidemia

**Conservative or Definitive Surgery:**
- Uterine Artery Ligation
- Hysterectomy

---

**For Resuscitation:**

**Aggressively Transfuse Based on Vital Signs, Blood Loss**

**KEY:** HIGH RATIO of FFP to RBC

Either: 6:4:1 PRBCs: FFP: Platelets
Or: 4:4:1 PRBCs: FFP: Platelets

### Unresponsive Coagulopathy:

- After 8-10 units PRBCs and coagulation factor replacement may consider risk/benefit of rFactor VIIa

### Once Stabilized:

Modified Postpartum Management; consider ICU

---

### BLOOD PRODUCTS

<table>
<thead>
<tr>
<th>Packed Red Blood Cells (PRBC)</th>
<th>Best first-line product for blood loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>(approx. 35-40 min. for crossmatch—assuming no sample is in the lab and assuming no antibodies are present) Transfuse O Negative blood if you cannot wait</td>
<td>1 unit = 450ml volume</td>
</tr>
<tr>
<td>If antibody positive, may take 1-24 hrs. for crossmatch</td>
<td>1 unit=450 ml volume and typically increases Hct by 3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fresh Frozen Plasma (FFP)</th>
<th>Highly desired if &gt;2 units PRBCs given, or for prolonged PT, aPTT &gt;1.5x control</th>
</tr>
</thead>
<tbody>
<tr>
<td>(approx. 35-45 min. to thaw for release)</td>
<td>1 unit = 180ml volume and typically increases Fibrinogen by 10mg/dL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Platelets (PLTS)</th>
<th>Priority for women with Platelets &lt;50,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local variation in time to release (may need to come from regional blood bank)</td>
<td>Single-donor Apheresis unit (= 6 units of platelet concentrates) provides 40-50k transient increase in platelets</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cryoprecipitate (CRYO)</th>
<th>Priority for women with Fibrinogen levels &lt;80</th>
</tr>
</thead>
<tbody>
<tr>
<td>(approx. 35-45 min. to thaw for release)</td>
<td>10 unit pack typically raises Fibrinogen 80-100mg/dL</td>
</tr>
<tr>
<td>Best for DIC with low fibrinogen and don’t need volume replacement</td>
<td>Caution: 10 units come from 10 different donors, so infection risk is proportionate.</td>
</tr>
</tbody>
</table>

---

California Maternal Quality Care Collaborative (CMQCC): Hemorrhage Taskforce (2009) visit: www.CMQCC.org for details

This project was supported by Title V funds received from the State of California Department of Public Health, Center for Family Health; Maternal Child and Adolescent Health Division