### 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),
  - □ If low or medium risk – lab to identify antibodies
  - □ If high risk - type & Crossmatch 2 units PRBCs

- 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

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

- 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 Type & Crossmatch if applicable

<table>
<thead>
<tr>
<th>Low (Type and Screen)</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 any additional medium 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></td>
<td>Large uterine fibroids</td>
<td>Known coagulopathy</td>
</tr>
</tbody>
</table>

### 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 Type & Crossmatch if applicable

### 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**
- >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

#### MOBILIZE

<table>
<thead>
<tr>
<th>Primary nurse, Physician or Midwife to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Activate OB Hemorrhage Protocol and Checklist</td>
</tr>
<tr>
<td>- Notify obstetrician (in-house and attending)</td>
</tr>
<tr>
<td>- Notify charge nurse</td>
</tr>
<tr>
<td>- Notify anesthesiologist</td>
</tr>
</tbody>
</table>

#### ACT

**Primary nurse:**
- Establish IV access if not present, at least 18 gauge
- Increase IV Oxytocin rate, 500 mL/hour of 10-40 units/1000mL solution;
- Titrate infusion rate to uterine tone
- Continue vigorous fundal massage
- 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
- Vital Signs, including O2 sat & level of consciousness (LOC) q 5 minutes
- Weigh materials, calculate and record cumulative blood loss q 5-15 minutes
- Administer oxygen to maintain O2 sats at >95%
- Empty bladder: place Foley with urimeter
- Type and Crossmatch for 2 units Red Blood Cells STAT (if not already done)
- Keep patient warm

**Primary nurse to:**
- Establish IV access if not present, at least 18 gauge
- Increase IV Oxytocin rate, 500 mL/hour of 10-40 units/1000mL solution;
- Titrate infusion rate to uterine tone
- Continue vigorous fundal massage
- 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
- Vital Signs, including O2 sat & level of consciousness (LOC) q 5 minutes
- Weigh materials, calculate and record cumulative blood loss q 5-15 minutes
- Administer oxygen to maintain O2 sats at >95%
- Empty bladder: place Foley with urimeter
- Type and Crossmatch for 2 units Red Blood Cells STAT (if not already done)
- Keep patient warm

**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

---

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

**proceed to STAGE 2**

### 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>
</table>
| Pitocin®
(Oxytocin)
10 units/ml | 10-40 units per 1000 ml, rate titrated to uterine tone | IV infusion | Continuous | Usually none
Nausea, vomiting, hyponatremia (“water intoxication”) with prolonged IV admin.
↓ BP and ↑ HR with high doses, esp IV push | Hypersensitivity to drug | Room temp |
| Methergine®
(Methylergonovine)
0.2mg/ml | 0.2 mg (not given IV) | IM | -Q 2-4 hours
-If no response after first dose, it is unlikely that additional doses will be of benefit
Nausea, vomiting
Severe hypotension, esp. with rapid administration or in patients with HTN or PIH | Hypertension, PIH, Heart disease
Hypersensitivity to drug
Caution if multiple doses of ephedrine have been used, may exaggerate hypertensive response w/possible cerebral hemorrhage | Refrigerate Protect from light |
| Hemabate®
(15-methyl PG F2a)
250mcg/ml | 250 mcg | IM or intra-myometrial (not given IV) | -Q 15-90 min
-Not to exceed 8 doses/24 hrs
-If no response after several doses, it is unlikely that additional doses will be of benefit.
Nausea, vomiting, Diarrhea
Fever (transient), Headache
Chills, shivering
Hypertension
Bronchospasm | Caution in women with hepatic disease, asthma, hypertension, active cardiac or pulmonary disease
Hypersensitivity to drug | Refrigerate |
| Cytotec®
(Misoprostol)
100 or 200mcg tablets | 800-1000mcg | Per rectum (PR) | One time | Nausea, vomiting, diarrhea
Shivering, Fever (transient)
Headache | Rare
Known allergy to prostaglandin
Hypersensitivity to drug | Room temp |
## 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>Team leader (OB physician):</td>
<td>Sequentially advance through procedures and other interventions based on etiology:</td>
</tr>
<tr>
<td>□ Call obstetrician to bedside</td>
<td>□ Additional uterotonic medication: Hemabate 250 mcg IM [if not contraindicated] OR Misoprostol 800-1000 mcg PR</td>
<td>Vaginal birth</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>□ Activate Response Team: Call: <strong>CODE OB</strong></td>
<td></td>
<td>• Visualize and repair</td>
</tr>
<tr>
<td>□ Notify Blood bank of hemorrhage; order products as directed</td>
<td><strong>Do not delay other interventions</strong> (see right column) while waiting for response to medications</td>
<td>If retained placenta:</td>
</tr>
<tr>
<td></td>
<td>□ Bimanual uterine massage</td>
<td>• D&amp;C</td>
</tr>
<tr>
<td><strong>Charge nurse:</strong></td>
<td>□ Move to OR (if on postpartum unit, move to L&amp;D or OR)</td>
<td>If uterine atony or lower uterine segment bleeding:</td>
</tr>
<tr>
<td>□ Notify Perinatologist or 2nd OB</td>
<td>□ Order 2 units PRBCs and bring to the bedside</td>
<td>• Intrauterine Balloon</td>
</tr>
<tr>
<td>□ Initiate OB Hemorrhage Record</td>
<td>□ Order labs STAT (CBC/Plts, Chem 12 panel, Coag Panel II, ABG)</td>
<td>If above measures unproductive:</td>
</tr>
<tr>
<td>□ If selective embolization, call-in Interventional Radiology Team and second anesthesiologist</td>
<td>□ Transfuse PRBCs based on <strong>clinical signs</strong> and response, do not wait for lab results</td>
<td>• Selective embolization (Interventional Radiology if available &amp; adequate experience)</td>
</tr>
<tr>
<td>□ Notify nursing supervisor</td>
<td></td>
<td><strong>C-section:</strong></td>
</tr>
<tr>
<td>□ Assign single person to communicate with blood bank</td>
<td></td>
<td>□ B-Lynch Suture</td>
</tr>
<tr>
<td>□ Call medical social worker or assign other family support person</td>
<td></td>
<td>□ Intrauterine Balloon</td>
</tr>
</tbody>
</table>

| **Second nurse (or charge nurse):** | **Blood Bank:** | If Uterine Inversion: |
| □ Place Foley with urimeter (if not already done) | □ Determine availability of thawed plasma, fresh frozen plasma, and platelets; initiate delivery of platelets if not present on-site | • Anesthesia and uterine relaxation drugs for manual reduction |
| □ Obtain portable light and OB procedure tray or Hemorrhage cart | □ Consider thawing 2 FFP (takes 30 min), use if transfusing >2 units PRBCs | If Amniotic Fluid Embolism: |
| □ Obtain blood products from the Blood Bank | □ Prepare for possible of initiation of the massive hemorrhage protocol | • Maximally aggressive respiratory, vasopressor and blood product support |
| □ Assist with move to OR (if indicated) | | If vital signs are worse than estimated or measured blood loss: possible uterine rupture or broad ligament tear with internal bleeding; **move to laparotomy** |

**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

**Once stabilized:** Modified Postpartum management with increased surveillance
### STAGE 3: OB Hemorrhage

Cumulative blood loss >1500ml, >2 units PRBCs given, VS unstable or suspicion for DIC

<table>
<thead>
<tr>
<th>MOBILIZE</th>
<th>ACT</th>
<th>THINK</th>
</tr>
</thead>
</table>
| 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 (In OR, anesthesiologist will assess and document VS)  
  - If transfer considered, notify ICU  
| Blood Bank:  
  - Prepare to issue additional blood products as needed – stay ahead  

#### 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, Coag Panel II STAT and Chem 12 panel 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

#### 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>Product</th>
<th>Description</th>
<th>Use</th>
</tr>
</thead>
</table>
| **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 = 450ml volume  
  If antibody positive, may take 1-24 hrs. for crossmatch; |  |
| **Fresh Frozen Plasma (FFP)**  
  (approx. 35-45 min. to thaw for release) | Highly desired if >2 units PRBCs given, or for prolonged PT, PTT  
  1 unit = 180ml 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 40-50k transient increase in platelets |  |
| **Cryoprecipitate (CRYO)**  
  (approx. 35-45 min. to thaw for release) | Priority for women with Fibrinogen levels <80  
  10 unit pack raises Fibrinogen 80-100mg/dl  
  Best for DIC with low fibrinogen and don’t need volume replacement  
  Caution: 10 units come from 10 different donors, so infection risk is proportionate. |  |

---

California Maternal Quality Care Collaborative (CMQCC): Hemorrhage Taskforce (2009) visit: [www.CMQCC.org](http://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