OBSTETRIC HEMORRHAGE EMERGENCY MANAGEMENT BUNDLE

We Practice What We Teach.
## Obstetric Hemorrhage Safety Bundle

**Why Do We Need this Bundle?**

- Incidence of Obstetric Hemorrhage is Increasing Nationally
- Hemorrhage Deaths Reviewed Generally have High “Preventability” Assessment
- This Bundle has been Proven to Work in the State of California

### Readiness (Every Unit)
- Hemorrhage Cart with Procedural Instructions (Balloons, Compression Stiches)
- Rapid Access to Hemorrhage Medications (Kit or Equivalent)
- Establish a Response Team: Multiple Partnerships / Unit Education, Drills, Debriefs
- Establish MTP and 0-Neg/Uncrossmatched Transfusion Protocols

### Recognition (Every Patient)
- Assessment of Hemorrhage Risk (Prenatal, on Admission, Ongoing in Labor & PP)
- Measurement of CUMMULATIVE Blood Loss
- Active Management of 3rd Stage (Oxytocin After Birth)

### Response (Every Hemorrhage)
- Unit-Standard, Stage-Based OB Hemorrhage Emergency Management Plan with Checklist
- Support Program for Patients, Families and Staff

### Reporting / System Learning (Every Unit)
- Establish a Culture of Huddles for High-Risk Patients and Post-Event Debriefings
- Review All Stage 3 Hemorrhages for Systems Issues
- Monitor Outcome and Process Metrics in Perinatal QI Committee
POLICY:
Active Management of the Third Stage of Labor Includes:
1. Oxytocin Administration Upon Delivery of the Anterior Shoulder of Labor
2. Immediate or Delayed Cord Clamping (Up to 60 Seconds)
3. Controlled Cord Traction

PURPOSE:
Decrease Severe Maternal Morbidity Related to Postpartum Hemorrhage.

A 2015 Cochrane Review Showed Benefits which Include:
- Reduced Risk of Hemorrhage > 1000 ml (RR 0.34, 95% CI 0.14-0.87)
- Reduced Risk of Postpartum Maternal Hemoglobin <9 g/dL (RR 0.50, 95% CI 0.30-0.83)
- Reduced Risk of Primary Blood Loss >500 ml (RR 0.34, 95% CI 0.27-0.44)
- Reduction in Maternal Blood Transfusion (RR 0.35, 95% CI 0.22-0.55)
- Reduction in Use of Therapeutic Uterotonics During the Third Stage or within the First 24 Hours, or Both (RR 0.19, 95% CI 0.15-0.23) Compared with Expectant Management
- Reduced Mean Maternal Blood Loss at Birth (-79 mL, 95% CI -96 to -62 mL)

Risks Include:
- Increases in Maternal Diastolic Blood Pressure >90 mmHg (RR 4.10)
- Increased Post-Delivery Pain and Use of Analgesia (RR 2.53)
- Increased Number of Women Returning to the Hospital Due to Bleeding (RR 2.21)

Exclusions:
- Multiple Gestations with Remaining Intrauterine Pregnancy, or Inability to Exclude Multiple Gestation – Oxytocin Bolus Should Not be Initiated Until Delivery of Second Twin
- Hypersensitivity or Medical Contraindication to Oxytocin

Procedure:
- Upon delivery of the anterior shoulder of infant, RN should start IV Oxytocin infusion; 40 units of Oxytocin in 1000 ml after verbal confirmation from delivering provider; 20 units over the first hour (500 ml/hour), followed by four hours at 5 units per hour (125 ml/hour) or if no IV access, 10 Units IM. Rate may be customized to clinical circumstance, with normal rates being between 10 and 40 units per hour.
- Cord clamping may be immediate or delayed.
- Controlled cord traction may be used to assist in delivery in placenta using concomitant supra-pubic pressure to reduce risk of uterine inversion.
OBSTETRIC HEMORRHAGE EMERGENCY MANAGEMENT BUNDLE – CHECKLIST FORMAT

STAGE 0 - ALL BIRTHS – PREVENTION AND RECOGNITION OF OB HEMORRHAGE PRENATAL ASSESSMENT AND 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 AND PLANNING

1. Verify Type & Antibody Screen from Prenatal Record.
2. Review hemoglobin and platelets.
3. Send CBC and type and screen on admission for all patients.
   UCMC blood bank normal operating procedure includes crossmatch of 2 units in patients with antibodies.
   - Evaluate for Risk Factors on admission, throughout labor, and postpartum (At every handoff).
     - If medium risk:
       - Review Hemorrhage Protocol
     - If high risk:
       - Order Type & Crossmatch 2 Units PRBCs
       - Notify OB Anesthesia.
4. Identify women who may decline transfusion.
   - Notify OB Provider for Plan of Care
   - Early Consult with OB Anesthesia
   - Review Consent Form

ADMISSION HEMORRHAGE RISK FACTOR EVALUATION

- LOW (Type and Screen)
  ✓ No Previous Uterine Incision
  ✓ Singleton Pregnancy
  ✓ ≤ 4 Previous Vaginal Births
  ✓ No Known Bleeding Disorder
  ✓ No History of PPH
- MEDIUM (Type and Screen)
  ✓ Prior Cesarean Birth(s) or Uterine Surgery
  ✓ Multiple Gestation
  ✓ > 4 Previous Vaginal Births
  ✓ Chorioamnionitis
  ✓ History of Previous PPH
  ✓ Large Uterine Fibroids
- HIGH (Type and Screen with Crossmatch as Clinically Applicable)
  ✓ Placenta Previa, Low Lying Placenta
  ✓ Suspected Placenta Accreta or Percreta
  ✓ Hematocrit < 30 AND Other Risk Factors
  ✓ Platelets < 100,000
  ✓ Active Bleeding Greater than Show) on Admit
  ✓ Known Coagulopathy

ONGOING RISK ASSESSMENT

- Evaluate for Development of Additional Risk Factors in Labor:
  - Prolonged Second Stage Labor
  - Prolonged Oxytocin Use
  - Active Bleeding
  - Chorioamnionitis
  - Magnesium Sulfate Treatment
- Monitor Women Postpartum for Increased Bleeding

ALL BIRTHS – PROPHYLACTIC OXYTOCIN, QUANTITATIVE EVALUATION OF BLOOD LOSS AND CLOSE MONITORING

- Active Management of Third Stage: Oxytocin Administration Upon Delivery of the Anterior Shoulder, Controlled Cord Traction
- Oxytocin Infusion: 40 Units Oxytocin in 1000 ml; 20 Units Over First Hour (500 ml/hour) Followed by Four Hours at 5 Units/hour (125 ml/hour) OR if no IV access, 10 Units IM
- Ongoing Quantitative Evaluation of Blood Loss Using Formal Methods, Such as Graduated Containers, Visual Comparisons and Weight of Blood Soaked Material (1 gm = 1 ml), Ongoing Evaluation of Vital Signs

If Cumulative Blood Loss > 500 ml Vaginal Birth or > 1000 ml C/S with Continued Bleeding
  or Vital Signs > 15% or HR ≥ 110, BP 85/45, O2 sat < 95%
  or Increased Bleeding During Recovery or Postpartum

PROCEED TO STAGE 1
OBSTETRIC HEMORRHAGE EMERGENCY MANAGEMENT BUNDLE – CHECKLIST FORMAT

STAGE 1 - OB HEMORRHAGE
Cumulative Blood Loss > 500 ml Vaginal Birth or > 1000 ml C/S with Continued Bleeding or Vital Signs > 15% change or HR ≥120, BP ≤90/45, O₂ sat <95% or Increased Bleeding During Recovery or Postpartum

MOBILIZE

Primary Nurse, Physician, or Certified Nurse Midwife to:
☐ Activate OB Hemorrhage Protocol and Checklist

Primary Nurse to:
☐ Notify Obstetrician or Certified Nurse Midwife and Senior Resident Physician
☐ Notify Charge Nurse
☐ Notify Anesthesiologist.

Charge Nurse to:
☐ Assist Primary Nurse as Needed or Assign Staff Member(s) to Assist

Primary Nurse or Designee to:
☐ Establish IV access if not present, at least 18 gauge; Increase IV Oxytocin rate 999 mL/hour of 40 units/1000 mL solution.
☐ Apply 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 sat >95%.
☐ Empty bladder: straight cath or place Foley with urimeter.
☐ Type and Crossmatch for 2 units Red Blood Cells STAT (if not already done).
☐ Keep patient warm.
☐ Tranexemic Acid 1 Gram IV – Give Over 10 Minutes.

Physician or Certified Nurse Midwife:
☐ Rule out retained Products of Conception, laceration, hematoma.

Surgeon (if Cesarean Birth and Incision is Not Closed):
☐ Inspect for uncontrolled bleeding at all levels, esp. broad ligament, posterior uterus, and retained placenta.

ACT

THINK

Consider Potential Etiology:
☐ Uterine Atony
☐ Trauma / Laceration
☐ Retained Placenta
☐ Amniotic Fluid Embolism
☐ Uterine Inversion
☐ Coagulopathy
☐ Placenta Accreta

Once Established:
Modified Postpartum Management with Increased Surveillance

If Continued Bleeding OR Continued Vital Sign Instability and < 1500 mL Cumulative Blood Loss
PROCEED TO STAGE 2
OBSTETRIC HEMORRHAGE EMERGENCY MANAGEMENT BUNLE – CHECKLIST FORMAT

STAGE 2 - OB HEMORRHAGE
Continued Bleeding, or Vital Sign Instability, and < 1500 ml Cumulative Blood Loss

MOBILIZE

Primary Nurse, Physician, or Certified Nurse Midwife to:
- Call obstetrician or Certified Nurse Midwife to Bedside, if Not Already There
- Call Anesthesiologist
- Activate Response Team – OB STAT Page
- Notify Blood Bank of Hemorrhage; Order Products as Directed

Charge Nurse to:
- Notify Generalist 2 (at UCMC)
- Bring Hemorrhage Cart to the Patient’s Location
- Initiate OB Hemorrhage Record
- Notify Nursing Supervisor
- Assign Single Person to Communicate with Blood Bank
- Designate Family Support (RN or Social Worker)

Act

Team Leader (OB Physician or Certified Nurse Midwife):
- Additional Uterotonic Medication: Hemabate 250 mcg IM (if Not Contraindicated)
  - Can Repeat Hemabate up to 8 Times Every 15 Minutes (Note 75% Respond to First Dose)
  - Continue IV Oxytocin and Provide Additional IV Crystalloid Solution

Do Not Delay Other Interventions While Waiting for Response to Medications.
(See “THINK” Column)
- Bimanual Uterine Massage
- Move to OR
- Order 2 Units PRBCs and Bring to the Bedside
- Order Labs STAT (CBC, CMP, PT/PT, Fibrinogen, ABG)
- Transfuse PRBCs Based Upon Clinical Signs and Response

Do Not Wait for Lab Results: Consider Emergency O-Negative Transfusion.

Primary Nurse (or Designee):
- Establish Second Large Bore IV, at Least 18 Gauge
- 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 – Increase Room Temperature, Provide Blankets

Secondary Nurse (or Charge Nurse):
- Place Foley with Urimeter (if Not Already Done)
- Obtain Blood Products from the Blood Bank (or Send Designee)
- 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
- Order 2-4 FFP, Use if Transfusing > 2 Units PRBCs
- Prepare for Possibility of Massive Transfusion

THINK

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
  - If Above Measures Unproductive:
    - Selective Embolization (Interventional Radiology, if Available and Adequate Experience) - Call IR if possibility
    - Consider Tranexamic Acid – May Be Used as Soon as Second Line Uterotonics
- C-Section:
  - B-Lynch Suture
  - Intrauterine Balloon
  - If Uterine Inversion:
    - Anesthesia and Uterine Relaxation Drugs for Manual Reduction
  - Amniotic Fluid Embolism:
    - Maximally Aggressive Respiratory, Vasopressor and Blood Product Support
  - If Vital Signs are Worse than Estimated or Measured Blood Loss:
    - Possible Uterine Rupture or Broad Ligament Tear with Internal Bleeding; Move to Laparotomy
- Once Stabilized:
  - Modified Postpartum Management with Increased Surveillance

Re-Evaluate Bleeding and Vital Signs
If Cumulative Blood Loss > 1500 mL, > 2 Units PRBCs Given, VS Unstable or Suspicion for DIC

PROCEED TO STAGE 3
OBSTETRIC HEMORRHAGE EMERGENCY MANAGEMENT BUNDLE – CHECKLIST FORMAT

STAGE 3 - OB HEMORRHAGE
Cumulative Blood Loss > 1500 ml, > 2 Units PRBCs Given, VS Unstable or Suspicious for DIC

MOBILIZE

Nurse or Physician to:
- Activate Massive Transfusion Protocol Blood Bank (UCMC Phone Number: 513-584-7888)

Charge Nurse or Designee to:
- Notify Advanced Gyn Surgeon (Gyn Oncologist)
- Inform SICU (Resident or RN)
- Call-In Second Anesthesiologist
- Call-In OR Staff, if Not Immediately Available
- Ensure Hemorrhage Cart Available at the Patient’s Location
- Reassign Staff as Needed
- Call-In Supervisor, CNS, or Manager
- Continue OB Hemorrhage Record (in OR, Anesthesiologist will Assess and Document VS)

Blood Bank to:
- Prepare to Issue Additional Blood Products as Needed – Stay Ahead

ACT

Establish Team Leadership and Assign Roles as Needed

Team Leader (OB Physician + OB Anesthesiologist, Anesthesiologist and/or Perinatologist and/or Intensivist):
- Massive Transfusion – (RBCs + FFP + 1 Apheresis Pack PLTS) (See "THINK" Column)
- Move to OR, if Not Already There
- Repeat CBC/PLTS, Coag Panel II STAT and Chem 12 Panel q 30-60 Minutes
- Transexemic Acid 1 Gram IV – Give Over 10 Minutes, if Not Already Given

Anesthesiologist/Intensivist (as Indicated):
- Arterial Blood Gases
- Central Hemodynamic Monitoring
- CVP or PA Line
- Arterial Line
- Vasopressor Support
- Intubation
- Calcium Replacement
- Electrolyte Monitoring

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 and Blood Product Administration
- Apply Sequential Compression Stockings to Lower Extremities
- Circulate in OR

Secondary Nurse and/or Anesthesiologist:
- Continue to Administer Meds, Blood Products and Draw Labs, as Ordered

Third Nurse:
- Recorder

THINK

Selective Embolization (IR):
- Interventions Based on Etiology Not Yet Completed

Conservative or Definitive Surgery:
- Uterine Artery Ligation
- Hysterectomy

Once Stabilized:
- Modified Postpartum Management with Increased Surveillance
- Consider ICU

RESUSCITATION

Aggressively Transfuse Based Upon Vital Signs, Blood Loss

After the First 2 Units of PRBCs Use Near Equal FFP and RBC for Massive Hemorrhage

4-6 PRBCs : 4 FFP : 1 Apheresis Platelets
Postpartum Hemorrhage Medications

**Hemorrhage at time of delivery**

- Oxytocin 20 units per hour for 2 hours or 10 units IM if no IV access
  - Increase Oxytocin to 40 units per hour
  - Methergine 0.2 mg IM
    - *Contraindicated in hypertension/repeat dose available in 2 hours
  - Hemabate 0.25 mg IM
    - *Contraindicated in asthma/repeat dose available q15 minutes, maximum 8
  - Tranexamic Acid 1000 mg IV
    - *Give over 10 minutes/repeat dose available in 30 minutes

**Hemorrhage on Postpartum Unit**

- Oxytocin 20 units per hour for 2 hours or 10 units IM if no IV access
  - Increase Oxytocin to 40 units per hour
  - Methergine 0.2 mg IM
    - *Contraindicated in hypertension/repeat dose available in 2 hours
  - Hemabate 0.25 mg IM
    - *Contraindicated in asthma/repeat dose available q15 minutes, maximum 8
  - Tranexamic Acid 1000 mg IV
    - *Give over 10 minutes/repeat dose available in 30 minutes

*Recommend co-administration of Hemabate and TXA if appropriate*
### Modified Early Warning Score (MEWS) Criteria

<table>
<thead>
<tr>
<th>Vital Sign</th>
<th>MEWS Criteria</th>
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<tbody>
<tr>
<td>RR (Breaths / Minute)</td>
<td>&gt; 30 or &lt; 10</td>
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<tr>
<td>O2 sat (%)</td>
<td>&lt; 95</td>
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<tr>
<td>HR (bpm)</td>
<td>&gt; 120 or &lt; 50</td>
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<tr>
<td>Systolic BP (mmHg)</td>
<td>&gt; 160 or &lt; 90</td>
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<tr>
<td>Diastolic BP (mmHg)</td>
<td>&gt; 100</td>
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<tr>
<td>UOP (ml / hr)</td>
<td>&lt; 35 x 2 Hours</td>
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<tr>
<td>Other Signs / Symptoms</td>
<td>Agitation, Confusion, Unresponsiveness, HA, SOB in pts with Preeclampsia</td>
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### Obstetric Hemorrhage Emergency Management Bundle

#### 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)</td>
<td>10-40 Units per 500-1000ml</td>
<td>IV Infusion</td>
<td>Continuous</td>
<td>Usually None</td>
<td>Nausea, Vomiting, Hyponatremia (&quot;Water Intoxication&quot;) with Prolonged IV Admin</td>
<td>Hypersensitivity to Drug</td>
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<td>10 Units/ml</td>
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<td>RateTit rated to Uterine Tone</td>
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<td>Methylergonovine</td>
<td>0.2 mg/ml</td>
<td>IM (Not Given IV)</td>
<td>Q2-4hrs</td>
<td>Nausea, Vomiting, Severe Hypertension, Esp. if Given IV, Which is Not Recommended</td>
<td>Hypertension, Preeclampsia, Cardiovascular 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)</td>
<td>250 mcg/ml</td>
<td>IM or Intra-Myometrial (Not Given IV)</td>
<td>Q15-90 min, Not to Exceed 8 Doses/24 Hrs, If No Response After Several Doses, it is Unlikely that Additional Doses Will Be of Benefit</td>
<td>Nausea, Vomiting, Diarrhea, Fever (Transient), Headache Chills, Shivering, Hypertension, Bronchospasm</td>
<td>Caution in Women with Hepatic Disease, Asthma, Hypertension, Active Cardio or Pulmonary Disease Hypersensitivity to Drug</td>
<td>Refrigerate</td>
</tr>
<tr>
<td>Cytotec (Misoprostol)</td>
<td>600-800 mcg</td>
<td>Sublingual or Oral</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 Temperature</td>
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<tr>
<td></td>
<td>100 or 200 mcg Tablets</td>
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#### Blood Products

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<thead>
<tr>
<th>Blood Product</th>
<th>Description</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Packed Red Blood Cells (PRBC)</td>
<td>(Approx. 35-40 min. for Crossmatch—Once Sample is in the Lab and Assuming No Antibodies Present)</td>
<td>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</td>
</tr>
<tr>
<td>Fresh Frozen Plasma (FFP)</td>
<td>(Approx. 35-45 min. to Thaw for Release)</td>
<td>Highly Desired if &gt; 2 Units PRBCs Given, or for Prolonged PT, PTT. 1 Unit = 180 ml Volume</td>
</tr>
<tr>
<td>Platelets (PLTS)</td>
<td>(Local Variation in Time to Release)</td>
<td>Priority for Women with Platelets &lt; 50,000. Single-Donor Apheresis Unit (= 6 Units of Platelet Concentrates) Provides 40-50 K Transient Increase in Platelets</td>
</tr>
<tr>
<td>Cryoprecipitate (CRYO)</td>
<td>(Approx. 35-45 min. to Thaw for Release)</td>
<td>Priority for Women with Fibrinogen Levels &lt; 80. 10 Unit Pack (or 1 Adult Dose) Raises Fibrinogen 80-100 mg/dl. Best for DIC with Low Fibrinogen and Doesn’t Need Volume Replacement. Caution: 10 Units Come from 10 Different Donors, So Infection Risk is Proportionate</td>
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