Maternal Safety Bundle for Obstetric Hemorrhage
Disclaimer: The following material is an example only and not meant to be prescriptive. ACOG accepts no liability for the content or for the consequences of any actions taken on the basis of the information provided.
OBSTETRIC HEMORRHAGE: KEY ELEMENTS

• RECOGNITION & PREVENTION (every patient)
  • Risk assessment
  • Universal active management of 3rd stage of labor

• READINESS (every unit)
  • Blood bank (massive transfusion protocol)
  • Cart & medication kit
  • Hemorrhage team with education & drills for all stakeholders

• RESPONSE (every hemorrhage)
  • Checklist
  • Support for patients/families/staff for all significant hemorrhages

• REPORTING / SYSTEMS LEARNING (every unit)
  • Culture of huddles & debrief
  • Multidisciplinary review of serious hemorrhages
  • Monitor outcomes & processes metrics
RISK ASSESSMENT: PRENATAL

- Suspected previa/accreta/increta/percreta*
- Pre-pregnancy BMI >50
- Clinically significant bleeding disorder
- Other significant medical/surgical risk
  (consider patients who decline transfusion)***

Transfer to appropriate level of care for delivery ***

* See supplemental guidance document on morbidly adherent placenta

** See supplemental guidance document on patients who decline blood products

*** Review availability of medical/surgical, blood bank, ICU, and interventional radiology support

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RISK ASSESSMENT: ANTEPARTUM

Timing of Delivery:

- Placenta accreta  
  Deliver 34 0/7-35 6/7 wks
- Placenta previa  
  Deliver 36 0/7-37 6/7 wks
- Prior classical cesarean  
  Deliver 36 0/7-37 6/7wks
- Prior myomectomy  
  Deliver 37 0/7-38 6/7 wks
- If extensive:  
  Deliver 36-37wks
RISK ASSESSMENT: LABOR & DELIVERY ADMISSION

**Medium Risk**
- Prior cesarean, uterine surgery, or multiple laparotomies
- Multiple gestation
- >4 prior births
- Prior obstetric hemorrhage
- Large myomas
- EFW >4000 g
- Obesity (BMI >40)
- Hematocrit <30% & other risk

**High Risk**
- Placenta previa/low lying
- Suspected accreta/percreta
- Platelet count <70,000
- Active bleeding
- Known coagulopathy
- 2 or more medium risk factors

**Type & SCREEN, review protocol**

**Type & CROSS, review protocol**

*Establish a culture of huddles for high-risk patients & post-event debriefing*
RISK ASSESSMENT: INTRAPARTUM

Medium Risk
- Chorioamnionitis
- Prolonged oxytocin >24 hours
- Prolonged 2nd stage
- Magnesium sulfate

Type & SCREEN, review protocol

High Risk
- New active bleeding
- 2 or more medium risk factors (admission &/or intrapartum)

Type & CROSS, review protocol

* Establish a culture of huddles for high-risk patients & post-event debriefing *
RISK ASSESSMENT: PLACENTA ACCRETA MANAGEMENT

• For one or more prior cesareans, placental location should be documented prior to scheduled delivery.

• Patients at high risk for placenta accreta should:
  – Obtain proper imaging to evaluate risk prior to delivery, and
  – Be transferred to appropriate level of care for delivery if accreta is suspected
UNIVERSAL ACTIVE MANAGEMENT OF 3\textsuperscript{RD} STAGE OF LABOR

- Increase IV Oxytocin rate, 500mL/hour of 10-40 units/500-1000mL solution
- Titrate infusion rate to uterine tone, up to 500mL as needed
In order to provide safe obstetric care institutions must:

- Have a functioning Massive Transfusion Protocol (MTP)
- Have a functioning Emergency Release Protocol (a minimum of 4 units of O-negative/uncrossmatched RBCs)*
- Have the ability to obtain 6 units PRBCs and 4 units FFP \textit{(compatible or type specific)} for a bleeding patient
- Have a mechanism in place to obtain platelets and additional products in a timely fashion

\textit{Blood transfusion or crossmatching should not be used as a negative quality marker & is warranted for certain obstetric events.}
STATEMENT ON THE USE OF BLOOD PRODUCTS

Blood transfusion or crossmatching should not be used as a negative quality marker and is warranted for certain obstetric events. In cases of severe obstetric hemorrhage, ≥4 units of blood products may be necessary to save the life of a maternity patient.

Hospitals are encouraged to coordinate efforts with their laboratories, blood banks, and quality improvement departments to determine the appropriateness of transfusion and quantity of blood products necessary for these patients.
BLOOD BANK: MASSIVE TRANSFUSION PROTOCOL

Important protocol items to be determined at each institution are:

1. How to activate MTP
2. Blood bank number & location; notify as soon as possible
3. Emergency release protocol that both blood bank staff and ordering parties (MD/RN/CNM) understand
4. How will blood be brought to L&D?
5. How will additional blood products/platelets be obtained?
6. Mechanism for obtaining serial labs, such as with each transfusion pack, to ensure transfusion targets achieved
BLOOD BANK: MASSIVE TRANSFUSION PROTOCOL

I. PATIENT CURRENTLY BLEEDING & AT RISK FOR UNCONTROLLABLE BLEEDING

1. Activate MTP – call (add number) and say “activate massive transfusion protocol”

2. Nursing/Anesthesia draw stat labs
   a. Type & crossmatch
   b. Hemoglobin and platelet count, PT(INR)/PTT, fibrinogen, and ABG (as needed)

II. IMMEDIATE NEED FOR TRANSFUSION

   (type and crossmatch not yet available)

1. Give 2-4 units O-negative PRBCs
   (“OB EMERGENCY RELEASE”)

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EXAMPLE

13
**BLOOD BANK: MASSIVE TRANSFUSION PROTOCOL**

**III. ANTICIPATE ONGOING MASSIVE BLOOD NEEDS**

**OBTAIN MASSIVE TRANSFUSION PACK** (consider using coolers); administer as needed in the following ratio 6:4:1)

- 6 units PRBCs
- 4 units FFP
- 1 apheresis pack of platelets

**IV. INITIAL LAB RESULTS**

1. **Normal** ➔ anticipate ongoing bleeding ➔ repeat massive transfusion pack ➔ bleeding controlled ➔ deactivate MTP

2. **Abnormal** ➔ repeat massive transfusion pack ➔ repeat labs ➔ consider cryoprecipitate and consultation for alternative coagulation agents (Prothrombin Complex Concentrate [PCC], recombinant Factor VIIa, tranexamic acid)
RECOMMENDED INSTRUMENTS
HEMORRHAGE CART

Vaginal

[ ] Vaginal retractors; long weighted speculum

[ ] Long instruments (*needle holder, scissors, Kelly clamps, sponge forceps*)

[ ] Intrauterine balloon

[ ] Banjo curette

[ ] Bright task light

[ ] Procedural instructions (*balloon*)

Cesarean/Laparotomy

[ ] Hysterectomy tray

[ ] #1 chromic or plain catgut suture & reloadable straight needle for B-Lynch sutures

[ ] Intrauterine balloon

[ ] Procedural instructions (*balloon, B-Lynch, arterial ligations*)
## RECOMMENDED INSTRUMENTS MEDICATION KIT

*(for rapid access to medications)*

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
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</thead>
<tbody>
<tr>
<td>Oxytocin (Pitocin)</td>
<td>2 pre-mixed bags</td>
</tr>
<tr>
<td>10-40 units per 500-1000mL solution</td>
<td></td>
</tr>
<tr>
<td>Oxytocin (Pitocin)</td>
<td>2 vials</td>
</tr>
<tr>
<td>10 units</td>
<td></td>
</tr>
<tr>
<td>15-methyl PGF$_{2\alpha}$ (Hemabate)</td>
<td>1 ampule *</td>
</tr>
<tr>
<td>250 micrograms/milliliters</td>
<td></td>
</tr>
<tr>
<td>Misoprostol (Cytotec)</td>
<td>5 tabs</td>
</tr>
<tr>
<td>200 microgram tablets</td>
<td></td>
</tr>
<tr>
<td>Metylergonovine (Methergine)</td>
<td>1 ampule *</td>
</tr>
<tr>
<td>0.2 milligrams/milliliters</td>
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</table>

*Needs refrigeration*
HEMORRHAGE CHECKLIST
Complete all steps in prior stage plus current stage regardless of stage in which patient presents.

RECOGNITION

- Call for assistance (obstetric hemorrhage team)
- Designate
  - Team leader
  - Checklist reader/recorder
  - Primary RN
- Announce
  - Cumulative blood loss
  - Vital signs
  - Determine stage
CHECKLIST: STAGE 1
Blood loss >500 mL vaginal OR blood loss >1000 mL cesarean WITH NORMAL VITAL SIGNS and LAB VALUES

INITIAL STEPS
- Ensure 16G or 18G IV access
- Increase IV fluid (crystalloid without oxytocin)
- Insert indwelling urinary catheter
- Fundal massage

MEDICATIONS
- Increase oxytocin, additional uterotonics

BLOOD BANK
- Type & crossmatch 2 units RBCs

ACTION
- Determine etiology & treat
- Prepare OR, if clinically indicated
  (optimize visualization/examination)

Oxytocin (Pitocin)
10-40 units per 500-1000mL solution

Methylergonovine (Methergine)
0.2 milligrams IM (may repeat)

15-methyl PGF$_{2\alpha}$ (Hemabate, Carboprost)
250 micrograms IM (may repeat in q15 minutes, maximum 8 doses)

Misoprostol (Cytotec)
800-1000 micrograms PR
600 micrograms PO or 800 micrograms PL

Tone (i.e., atony)
Trauma (i.e., laceration)
Tissue (i.e., retained products)
Thrombin (i.e., coagulation dysfunction)
CHECKLIST: STAGE 2
Continued bleeding EBL up to 1500 mL OR
>2 uterotonics WITH NORMAL VITAL SIGNS and LAB VALUES

INITIAL STEPS
- Mobilize additional help
- Place 2nd IV (16-18G)
- Draw STAT labs (CBC, coags, fibrinogen)
- Prepare OR

MEDICATIONS
- Continue Stage 1 medications

BLOOD BANK
- Obtain 2 units RBCs (DO NOT wait for labs. Transfuse per clinical signs/symptoms)
- Thaw 2 units FFP

ACTION
- Escalate therapy with goal of hemostasis

Huddle and move to Stage 3 if continued blood loss and/or abnormal VS
INTRAUTERINE BALLOON TECHNIQUE

• Insert under ultrasound guidance

• Inflate to 500 cc with sterile water or NaCl

• Use vaginal packing (iodoform or antibiotic soaked gauze) to maintain correct placement and maximize tamponade

• Gentle traction — secure to patient’s leg or attach weight <than 500 g
INTRAUTERINE BALLOON TECHNIQUE

• Transabdominal placement (via incision) — late after incision is closed
• Connect to fluid collection bag to monitor hemostasis
• Continuous monitoring of vital signs and signs of increased bleeding
• May need to flush clots with sterile isotonic saline
• Maximum time balloon can remain in place is 24 hours
• To deflate:
  – Remove tension from shaft
  – Remove packing
  – Aspirate fluid
  – Remove catheters gently
SURGICAL MANAGEMENT

- Uterine curettage
- Placental bed suture
- Uterine artery ligation
- Uteroovarian ligation
- Repair uterine rupture
- B-Lynch suture, multiple square sutures
- Hysterectomy

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FEMALE PELVIC SURGERY VIDEO ATLAS SERIES
Mickey Karam, Series Editor

Management of Acute Obstetric Emergencies
Baha Sibai, MD
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CHECKLIST: STAGE 3

Continued bleeding with EBL >1500 mL OR >2 units RBCs given OR Patient at risk for occult bleeding/coagulopathy OR any patient with abnormal vital signs/labs/oliguria

INITIAL STEPS

- Mobilize additional help
- Move to OR
- Announce clinical status
  (vital signs, cumulative blood loss, etiology)
- Outline & communicate plan

MEDICATIONS

- Continue Stage 1 medications

BLOOD BANK

- Initiate massive transfusion protocol
  (If clinical coagulopathy: add cryoprecipitate, consult for additional agents)

ACTION

- Achieve hemostasis, interventions based on etiology

Oxytocin (Pitocin)
10-40 units per 500-1000mL solution

Methylergonovine (Methergine)
0.2 milligrams IM (may repeat)

15-methyl PGF$_{2\alpha}$ (Hemabate, Carboprost)
250 micrograms IM (may repeat in q15 minutes, maximum 8 doses)

Misoprostol (Cytotec)
800-1000 micrograms PR
600 micrograms PO or 800 micrograms PL
CHECKLIST: STAGE 4
Cardiovascular Collapse (massive hemorrhage, profound hypovolemic shock or amniotic fluid embolism)

INITIAL STEPS
- Mobilize additional resources

MEDICATIONS
- ACLS

BLOOD BANK
- Simultaneous aggressive massive transfusion

ACTION
- Immediate surgical intervention to ensure hemostasis (hysterectomy)
CHECKLIST: POST-HEMORRHAGE MANAGEMENT

- Determine disposition of patient (whether ICU required)
- Debrief with the whole obstetric care team
- Debrief with patient and family
- Document
REPORTING / SYSTEMS LEARNING
(every unit)

• Establish a culture of huddles for high-risk patients and post-event debriefs
• Conduct a multidisciplinary review of serious hemorrhages for systems issues
• Monitor outcomes and processes metrics
CONCLUSION

• Early opportunities exist to assess risk, anticipate, and plan in advance of an obstetric hemorrhage.

• Multidisciplinary coordination and preparation, particularly with the blood bank, is critical in order to provide safe obstetrical care.

• A standardized approach to obstetric hemorrhage includes a clearly defined, staged checklist of appropriate actions to be taken in an emergency situation and can help to improve patient outcomes.
# Index of Hemorrhage Bundle Content Changes

(November 2015)

## Educational Materials

<table>
<thead>
<tr>
<th>Obstetric Hemorrhage Slide Deck</th>
<th>Slide 4</th>
<th>ADDED - Notation re: MAP, patients who decline blood products</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Slide 9</td>
<td>REVISED - Oxytocin dosing for active management of 3&lt;sup&gt;rd&lt;/sup&gt; stage</td>
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<td>Slide 10</td>
<td>ADDED - “Blood transfusion or crossmatching should not be used as a negative quality marker &amp; is warranted for certain obstetric events.”</td>
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<td>Slide 11</td>
<td>NEW – Statement on the use of blood products</td>
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<td>Slide 16</td>
<td>REVISED - Oxytocin dosing &amp; preparation for medication kit</td>
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<tr>
<td></td>
<td>Slides 17-19; Slides 23-25</td>
<td>REVISED – Simplified &amp; streamlined staged checklist</td>
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<tr>
<th>Prenatal/Antepartum Risk Assessment Table</th>
<th>ADDED - Reference to guidance document for patients who decline blood products</th>
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<td>Recommended instruments checklist (cart &amp; med kit)</td>
<td>REVISED - oxytocin dosing &amp; preparation for medication kit</td>
</tr>
<tr>
<td>Managing Maternal Hemorrhage poster</td>
<td>REVISED - oxytocin dosing (under medication for uterine atony)</td>
</tr>
<tr>
<td>Checklist (stages 1-4)</td>
<td>REVISED – simplified &amp; streamlined</td>
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## Guidance Documents (NEW)

- Morbidly Adherent Placenta (MAP)
- Patients Who Decline Blood Products
- Quantification & Semi-Quantification of Blood Loss

  *Available in web-based format only*

## Other Resources

- MAP Hospital Protocol templates
- Calculating Blood Loss algorithms

  *Available in web-based format only*
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References


Lyndon A, Lagrew D, Shields L, Melsop K, Bingham B, Main E (Eds). “Improving Health Care Response to Obstetric Hemorrhage.” (California Maternal Quality Care Collaborative Toolkit to Transform Maternity Care) Developed under contract #08-85012 with the California Department of Public Health; Maternal, Child and Adolescent Health Division; Published by the California Maternal Quality Care Collaborative, July 2010. https://cmqcc.org/ob_hemorrhage
