

# Mississippi Perinatal Quality Collaborative

## Obstetric Hemorrhage Initiative Toolkit

A Collaborative Quality Improvement Initiative with the  
Alliance for Innovation in Maternal Health



Version 1: November 2016



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## INTRODUCTION

Obstetric hemorrhage remains one of the most significant contributors to preventable maternal morbidity and mortality. Several investigators have demonstrated that maternal deaths from obstetric hemorrhage are often associated with modifiable provider and systems level factors including gaps in communication, delays in care and ineffective treatment strategies. While many adverse events are neither predictable nor preventable, the application of standardized, evidence-based and team-based care across the hospital setting can effectively reduce maternal injury and death. Due to numerous factors, Mississippi has a disproportionately high pregnancy-related mortality rate with 33.5 pregnancy-related deaths per 100,000 live births<sup>1</sup> compared to 15.9 for the United States as a whole<sup>2</sup>. Improving maternal outcomes in Mississippi and the US will require focused, system-wide efforts that maximize the use of evidence-based strategies.

Following the call of the National Partnership for Maternal Safety<sup>3</sup>, the Mississippi Perinatal Quality Collaborative (MSPQC) aims to support the use of Patient Safety Bundles which address systematic, optimal management of severe maternal hypertension, venous thromboembolism and obstetric hemorrhage in every birthing facility in Mississippi. Patient Safety Bundles are small, straightforward sets of evidence-based practices that, when performed collectively and reliably, have been proven to improve patient outcomes.<sup>4</sup> The bundles are not prescriptive; each facility is encouraged to select the tools that best suit its own needs and resources. MSPQC will be working with The Alliance for Innovation in Maternal Healthcare (AIM) to implement the Obstetric Hemorrhage Initiative (OHI) throughout Mississippi. AIM was formed to support statewide perinatal quality efforts to effectively implement improvement strategies that can help reduce maternal morbidity and mortality.

The overall goals of the MSPQC Obstetric Hemorrhage Initiative are:

1. To reduce severe maternal morbidity and mortality related to obstetric hemorrhage among women who give birth in Mississippi.
2. To guide and support obstetric care providers and birthing facilities in Mississippi in implementing evidence-based, collaborative, patient-centered practices to prevent and manage obstetric hemorrhage.

Participation with the MSPQC OHI is voluntary. Participating hospitals will receive expert guidance, tools and resources all free of charge through a grant from AIM with MSPQC.

Participating hospitals will be asked to:

- Complete the AIM baseline survey.
- Establish a team to lead the obstetric hemorrhage bundle implementation.
- Engage in regular monthly calls for education, feedback and collaboration.
- Actively work to implement the obstetric hemorrhage bundle during the project period.
- Submit process and structure measures to the AIM data portal on a monthly basis.

<sup>1</sup> Mississippi Maternal Mortality Review Committee, Mississippi Pregnancy-Related Mortality Rate, 2014, unpublished.

<sup>2</sup> Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, Trends in Pregnancy-Related Mortality in the United States 1987-2012. [www.cdc.gov/reproductivehealth/maternalinfanthealth/](http://www.cdc.gov/reproductivehealth/maternalinfanthealth/); accessed 10/18/2016

<sup>3</sup> D'Alton, Mary, Main, E., Menard, K., Levy, B. The National Partnership of Maternal Safety. *Obstetrics & Gynecology*, Vol. 123, No. 5, May 2014

<sup>4</sup> Institute for Healthcare Improvement.

#### THIS TOOLKIT CONTAINS :

- PowerPoint slide decks with specific implementation guidance
- Visual aids for the obstetric unit
- Risk assessment guidelines
- Management algorithms & checklists
- Medication & transfusion guidelines
- Debriefing forms
- Sample hospital policies and protocols
- Sample simulation scenarios
- Support tools for patients, families and staff

#### HOW TO USE THIS TOOLKIT

This toolkit is organized according to the 4-R's of the AIM Obstetric Hemorrhage Patient Safety Bundle: **R**eadiness, **R**ecognition & Prevention, **R**esponse and **R**eporting/Systems Learning. The MSPQC Obstetric Hemorrhage Advisory Team has selected key resources from existing toolkits that may be adopted and adapted by each facility. This is not an exhaustive compilation of tools; it does, however, provide the core components needed for a facility to successfully implement the obstetric hemorrhage bundle and meet the goals of the MSPQC Obstetric Hemorrhage Initiative. We fully encourage providers and hospitals to review and utilize the resources from the following organizations in addition to the MSPQC, as they each offer valuable tools and guidance for addressing obstetric hemorrhage.

Key references for this toolkit include:

**AIM:** [www.safehealthcareforeverywoman.org/aim.php](http://www.safehealthcareforeverywoman.org/aim.php)

**Florida Perinatal Quality Collaborative** (2015) Florida Obstetric Hemorrhage Initiative Toolkit: A Quality Improvement Initiative for Obstetric Hemorrhage Management.

[www.health.suf.edu/publichealth/chiles/fpgc/OHI.htm](http://www.health.suf.edu/publichealth/chiles/fpgc/OHI.htm)

**California Maternal Quality Care Collaborative**- Lyndon A, Lagrew D, Shields L, Main E, Cape V. Improving HealthCare Response to Obstetric Hemorrhage. (CMQCC Toolkit to Transform Maternity Care) Developed under contract #11-1006 with California Department of Public Health: Maternal Child and Adolescent Health Division; Published by the CMQCC, 3/17/15

[www.cmqcc.org/projects](http://www.cmqcc.org/projects)

**American Congress of Obstetricians and Gynecologists, District II, Safe Motherhood Initiative**

Obstetric Hemorrhage Toolkit. <http://www.acog.org/About-ACOG/ACOG-Districts/District-II/SMI-OB-Hemorrhage>

**Association of Women's Health Obstetric and Neonatal Nurses** Postpartum Hemorrhage Project: A Multi-Hospital Quality Improvement Program. [www.pphproject.org](http://www.pphproject.org)

WHAT IS AIM?



The Alliance for Innovation on Maternal Health (AIM) is a national partnership of organizations poised to reduce severe maternal morbidity by 100,000 events and maternal mortality by 1,000 deaths by 2018. The AIM program is funded through a cooperative agreement with the Maternal and Child Health Bureau/Health Resource Services Administration.

- AIM aligns national, state, and hospital level efforts to improve maternal health and safety
- AIM develops maternal safety bundles and promotes their implementation in all birth facilities to ensure consistent maternity care



- Obstetric Hemorrhage
  - Severe Hypertension/Preeclampsia
  - Maternal Prevention of Venous Thromboembolism
  - Safe Reduction of Primary C/S | Support for Intended Vaginal Birth
  - Reduction of Peripartum Racial Disparities
  - Postpartum Care Basics for Maternal Safety
  - Patient, Family, and Staff Support after a Severe Maternal Event
- AIM facilitates multidisciplinary and interagency collaboration between states and hospitals
  - AIM supports harmonized data-driven continuous quality improvement processes
  - AIM provides evidence-based implementation resources to streamline bundle implementation

Core AIM Partners Include:

 <p>AMERICAN COLLEGE of NURSE-MIDWIVES With women, for a Lifetime®</p>	 <p>The American College of Obstetricians and Gynecologists WOMEN'S HEALTH CARE PHYSICIANS</p>	 <p>AMCHP ASSOCIATION OF MATERNAL &amp; CHILD HEALTH PROGRAMS</p>
<p>American College of Nurse Midwives</p>	<p>The American College of Obstetricians and Gynecologists</p>	<p>Association of Maternal &amp; Child Health Programs</p>
 <p>ASHRM AMERICAN SOCIETY FOR HEALTHCARE RISK MANAGEMENT safe and trusted healthcare A personal membership group of the American Hospital Association</p>	 <p>astho™</p>	 <p>AWHONN PROMOTING THE HEALTH OF WOMEN AND NEWBORNS</p>
<p>American Society for Healthcare Risk Management</p>	<p>Association of State and Territorial Health Officials</p>	<p>Association of Women's Health Obstetric and Neonatal Nurses</p>
 <p>CMQCC CALIFORNIA MATERNAL QUALITY CARE COLLABORATIVE</p>	 <p>The Health Resources and Services Administration Maternal and Child Health Bureau</p>	 <p>Society for Maternal-Fetal Medicine</p>
<p>California Maternal Quality Care Collaborative</p>	<p>HRSA Maternal and Child Health Bureau</p>	<p>Society for Maternal Fetal Medicine</p>



## READINESS

### Every unit

- Hemorrhage cart with supplies, checklist, and instruction cards for intrauterine balloons and compressions stitches
- Immediate access to hemorrhage medications (kit or equivalent)
- Establish a response team - who to call when help is needed (blood bank, advanced gynecologic surgery, other support and tertiary services)
- Establish massive and emergency release transfusion protocols (type-O negative/uncrossmatched)
- Unit education on protocols, unit-based drills (with post-drill debriefs)

## RECOGNITION & PREVENTION

### Every patient

- Assessment of hemorrhage risk (prenatal, on admission, and at other appropriate times)
- Measurement of cumulative blood loss (formal, as quantitative as possible)
- Active management of the 3rd stage of labor (department-wide protocol)

## RESPONSE

### Every hemorrhage

- Unit-standard, stage-based, obstetric hemorrhage emergency management plan with checklists
- Support program for patients, families, and staff for all significant hemorrhages

## REPORTING/SYSTEMS LEARNING

### Every unit

- Establish a culture of huddles for high risk patients and post-event debriefs to identify successes and opportunities
- Multidisciplinary review of serious hemorrhages for systems issues
- Monitor outcomes and process metrics in perinatal quality improvement (QI) committee

Standardization of health care processes and reduced variation has been shown to improve outcomes and quality of care. The Council on Patient Safety in Women's Health Care disseminates patient safety bundles to help facilitate the standardization process. This bundle reflects emerging clinical, scientific, and patient safety advances as of the date issued and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed. Although the components of a particular bundle may be adapted to local resources, standardization within an institution is strongly encouraged.

The Council on Patient Safety in Women's Health Care is a broad consortium of organizations across the spectrum of women's health for the promotion of safe health care for every woman.

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For more information visit the Council's website at [www.safehealthcareforeverywoman.org](http://www.safehealthcareforeverywoman.org)

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# PATIENT SAFETY BUNDLE

# Obstetric Hemorrhage

# READINESS

There are 5 domains of Readiness to be addressed by every facility to prevent delays and prepare for the optimal management of obstetric hemorrhage.

## Recommendations for Every Unit:

1. **Develop a hemorrhage cart with supplies, checklist, and instruction cards for intrauterine balloons and compression stitches**
2. **Facilitate immediate access to hemorrhage medications**
3. **Establish a obstetric emergency response team**
4. **Established massive transfusion or emergency release of blood protocols**
5. **Establish unit education on hemorrhage protocols with unit-based drills and debriefs for all members of the care team**

## Recommended Education:

AIM eModule 2: Obstetric Hemorrhage Readiness

<http://www.safehealthcareforeverywoman.org/eModules/eModule-2-Readiness/presentation.html>

## Hemorrhage Cart & Medication Access

The adequate and efficient response to postpartum hemorrhage (PPH) requires rapid access to instruments, tools and medications needed for treatment. Hemorrhage carts or kits are designed to consolidate all of the necessary resources for the rapid management of common causes of obstetric hemorrhage. Hemorrhage carts commonly include treatment algorithms and procedural technique instructions, instruments for improved visualization, laceration repair, uterine tamponade, IV access and fluid administration and necessary lab draws. Hemorrhage carts can be stored on labor and delivery units, postpartum floors, emergency rooms and obstetrical triage units. Each facility should develop its own hemorrhage cart with locally available resources and implement a process for regular inspection, stocking and staff education about its use and location. Units are encouraged to separately develop emergency hysterectomy trays for OR suites.

Medications should be stored together in a central location for immediate access. Units should work with pharmacy departments to determine storage and access policies and regularly monitor the time from medication request to administration as part of quality audits and drills.

### Hemorrhage Cart Quality Measure

1. Does your hospital have OB hemorrhage supplies readily available, typically in a cart or mobile box? ( Reported Annually or at project completion date)

#### OB Hemorrhage Cart: Recommended Instruments

- Set of vaginal retractors (long right angle); long weighted speculum
- Sponge forceps (minimum: 2)
- Sutures (for cervical laceration repair and B-Lynch)
- Vaginal Packs
- Uterine balloon
- Banjo curettes, several sizes
- Long needle holder
- Uterine forceps
- Bright task light on wheels; behind ultrasound machine
- Diagrams depicting various procedures (e.g. B-Lynch, uterine artery ligation, Balloon placement)

#### OB Hemorrhage Medication Kit: Available in L&D and Postpartum Floor PYXIS/refrigerator

- Pitocin 10-40 units per 500-1000mL NS 1 bag
- Hemabate 250 mcg/mL 1 ampule
- Cytotec 200 mcg tablets 5 tabs
- Methergine 0.2 mg/mL 1 ampule

#### OB Hemorrhage Tray: Available on Postpartum Floor

- IV start kit
- 16 gauge angiocath
- 1 liter bag lactated Ringers
- IV tubing
- Sterile Speculum
- Urinary catheter kit with urimeter
- Flash light
- Lubricating Jelly
- Assorted sizes sterile gloves
- Lab tubes: red top, blue top, tiger top

**OB HEMORRHAGE CARTS, KITS- RECOMMENDED INSTRUMENTS & SUPPLIES**



Reference: California Maternal Quality Care Collaborative: Obstetric Hemorrhage Toolkit V 2.0

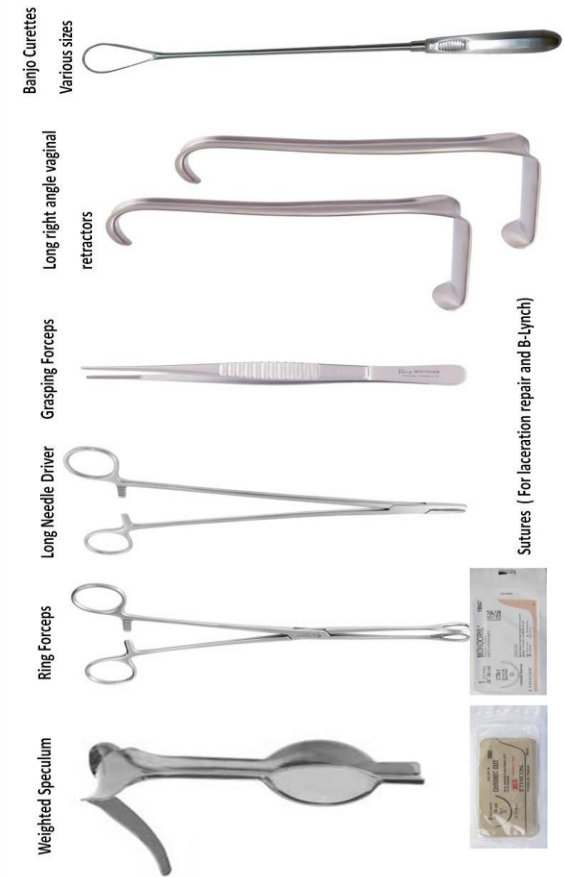
**POST PARTUM FLOOR HEMORRHAGE KIT**

**MEDICATIONS: L&D, OR ,POST PARTUM**

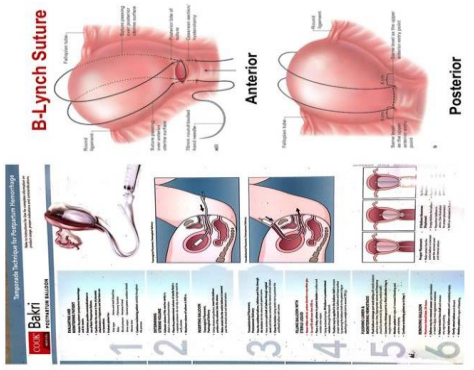
Recommendation  
Labor and delivery units construct a sterile tray/kit that provides rapid access to instruments and supplies used to treat PPH. All OB staff are trained about contents, location and use of carts.



**HEMORRHAGE CART INSTRUMENTS**



Diagrams Depicting Various Procedures (Balloon placement, B-Lynch)



## Obstetric Emergency Response Team

As a critical component to Readiness, each facility should establish a core obstetric hemorrhage response team based upon available resources and degree of hemorrhage severity. The patient and family members should be viewed as the central focus of the response team and be involved in care decisions, kept informed and be included in debriefings and updates.

### **Suggested Obstetric Hemorrhage Response Team Members:**

- Obstetric provider
- Anesthesia provider
- Bedside nurse
- Rapid Response Team
- Blood Bank
- Pharmacist
- ICU Team
- General Surgeon
- ED Physician
- Neonatal Team
- Social Services/Chaplain

### **Core Activities of Obstetric Hemorrhage Response Team:**

- Establish obstetric hemorrhage policies and guidelines
- Determining simple and reliable way to notify all team members of an obstetric hemorrhage
- Education of staff regarding guidelines and communication strategies

### **Suggested Resources:**

ACOG Committee Opinion 590: Preparing for clinical emergencies in obstetrics and gynecology  
<http://www.acog.org/-/media/Committee-Opinions/Committee-on-Patient-Safety-and-Quality-Improvement/co590.pdf?dmc=1&ts=20150424T1055548324>

CMQCC Obstetric Hemorrhage Hospital Level Implementation Guide  
<http://www.safehealthcareforeverywoman.org/downloads/Hemorrhage-Bundle/1-Readiness/Readiness-5-CMQCC-Obstetric-hemorrhage-hospital-level-implementation-guide.pdf>

TeamSTEPS: National Implementation (AHRQ)  
<http://www.ahrq.gov/teamsteps/index.html>

Massive Transfusion Protocols

Example Massive Transfusion Protocol: (See Appendix; CMQCC Toolkit for additional examples)

Source: ACOG District II: Safe Motherhood Initiative

EXAMPLE

**BLOOD BANK:**

**Massive Transfusion Protocol (MTP)**

In order to provide safe obstetric care, institutions MUST:

- Have a minimum of 4 units of O-negative PRBCs
- Have the ability to obtain 6 units PRBCs & 4 units FFP (compatible or type specific) for a bleeding patient
- Have a mechanism in place to obtain platelets & additional products in a timely fashion

Blood transfusion or crossmatching should not be used as a negative quality marker & is warranted for certain obstetric events.

<p><b>1 Patient currently bleeding &amp; at risk for uncontrollable bleeding</b></p> <p><b>A</b> Activate MTP - call <b>(ADD NUMBER)</b> &amp; say "activate massive transfusion protocol"</p> <p><b>B</b> Nursing/anesthesia draw stat labs - type &amp; crossmatch - hemoglobin &amp; platelet count, PT (INR)/PTT, fibrinogen, &amp; ABG (as needed)</p> <p style="text-align: right;">➔</p>	<p><b>2 Immediate need for transfusion (type &amp; crossmatch not yet available)</b></p> <p><b>A</b> Give 2-4 units O-negative PRBCs</p> <p><b>B</b> <b>"OB EMERGENCY RELEASE"</b></p> <p style="text-align: right;">➔</p>
<p><b>3 Anticipate ongoing massive blood needs</b></p> <p><b>A</b> Obtain massive transfusion pack - Consider using coolers</p> <p><b>B</b> Administer as needed in a 6:4:1 ratio - 6 units PRBCs - 4 units FFP - 1 apheresis pack of platelets</p> <p style="text-align: right;">➔</p>	<p><b>4 Initial lab results</b></p> <p><b>A</b> Normal &gt; anticipate ongoing bleeding &gt; repeat massive transfusion pack &gt; bleeding controlled &gt; deactivate MTP</p> <p><b>B</b> Abnormal &gt; repeat massive transfusion pack &gt; repeat labs &gt; consider cryoprecipitate and consultation for alternative coagulation agents (Prothrombin Complex Concentrate [PCC], recombinant Factor VIIa, tranexamic acid)</p>

**IMPORTANT PROTOCOL ITEMS TO BE DETERMINED AT EACH INSTITUTION:**

- How to activate MTP:  
\_\_\_\_\_
- Blood bank # & location; notify ASAP:  
I will call: \_\_\_\_\_
- Emergency release protocol that both blood bank staff & ordering parties (MD/RN/CNM) understand:  
\_\_\_\_\_
- How will blood be brought to L&D?  
\_\_\_\_\_
- How will additional blood products/platelets be obtained?  
\_\_\_\_\_
- Mechanism for obtaining serial labs, such as with each transfusion pack, to ensure transfusion targets achieved:  
\_\_\_\_\_

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## Unit Education

All obstetric providers and nurses and supporting clinical staff should complete an educational program that covers the major components of obstetric hemorrhage risk assessment, prevention and treatment as well as training about planned or implemented protocols and policies on a regular basis, at least every 2 years. Online training, lectures and assigned readings are all potential approaches to standard unit education. A clinical leader for the OHI within each facility should monitor progress of staff in completing the selected education program.

### Unit Education Quality Measures- Provider & Nurses:

1. At the end of this quarter, what cumulative proportion of staff has completed (within the last 2 years) an education program on Obstetric Hemorrhage?
2. At the end of this quarter, what cumulative proportion of staff has completed (within the last 2 years) an education program on the Obstetric Hemorrhage bundle elements and the unit-standard protocol?

### AIM eModules

MSPQC supports the use of AIM eModules for standardized education of all obstetric providers and clinical support staff involved in the care of pregnant and postpartum women. The AIM eModules have been designed to be interactive and collaborative. Each of the 4-R domains are addressed in the obstetric hemorrhage eModules. The eModules are available free of cost online at [www.safehealthcareforeverywoman.org/aim-emodules](http://www.safehealthcareforeverywoman.org/aim-emodules) as well as within the HealthStream Catalog for subscribing healthcare facilities.

### For the OHI each obstetric provider and obstetric nurse should complete the following eModules:

- AIM eModule Introduction
- AIM eModule 1: Maternal Early Warning System (MEWS)
- AIM eModule 2: Obstetric Hemorrhage

### ACOG Practice Bulletin No. 7, October 2006: Postpartum Hemorrhage

### Existing Slide Sets for Professional Education:

#### Example #1: ACOG District II, Safe Motherhood Initiative, Obstetric Hemorrhage Slide Set

Available online: <http://www.acog.org/About-ACOG/ACOG-Districts/District-II/SMI-OB-Hemorrhage>

#### Example #2: CMQCC Planning for and Responding to Obstetric Hemorrhage, California Maternal Quality Care Collaborative Obstetric Hemorrhage Version 2.0 Task Force

Available online: <https://www.cmqcc.org/resource/ob-hemorrhage-toolkit-v20-educational-slideset>

## SIMULATION & DRILLS

Simulation has been demonstrated to improve short term response to obstetric emergencies and improve long term recollection. The goal of performing simulation scenarios is to test preparedness for a clinical emergency, identify strengths and weaknesses in unit policies and procedure, provide hands-on training for less experienced staff and enhance teamwork and communication. Participants in the OHI are encouraged to arrange scheduled and unscheduled drills that involve all members of the clinical care and support team who may play a role in the management of an obstetric hemorrhage. Simulations can be performed in a simulation lab or classroom, while drills ideally take place 'in-situ' or on the involved unit (Labor and Delivery, Postpartum floor, Emergency Department).

### Simulation & Drills Quality Measures- Provider & Nurses:

Report # of Drills and the drill topics

1. In this quarter, how many OB drills (In Situ and/or Sim Lab) were performed on your unit for any maternal safety topic?
2. In this quarter, what topics were covered in the OB drills?

### Recommended Resources:

**ACOG Ob-GYN Simulations Curricula: Postpartum Hemorrhage: Uterine Atony**

<http://www.acog.org/About-ACOG/ACOG-Departments/Simulations-Consortium/OB-GYN-Simulations-Curricula>

**AWHONN OB Hemorrhage Webinars: Simulation Based Training Strategies**

<http://www.pphproject.org/resources.asp>

**CMQCC OB Hemorrhage Toolkit V 2.0**

**OB Hemorrhage Simulation Drills, Educational Tools #1- #4**

<https://www.cmqcc.org/resources-tool-kits/toolkits/ob-hemorrhage-toolkit>

**Wisconsin Association for Perinatal Care: Case Scenario for the Postpartum Hemorrhage Drill**

[http://www.perinatalweb.org/themes/wapc/assets/docs/participant\\_drill.pdf](http://www.perinatalweb.org/themes/wapc/assets/docs/participant_drill.pdf)

**Kaiser Permanente Postpartum Hemorrhage Perinatal Simulation Scenarios**

[http://kp.simmedical.com/sites/kaiser/resources/pdf/perinatal\\_postpartum\\_hemorrhage.pdf](http://kp.simmedical.com/sites/kaiser/resources/pdf/perinatal_postpartum_hemorrhage.pdf)

**SAMPLE CASE SCENARIO: Kaiser Permanente**

# PERINATAL Postpartum Hemorrhage



## Perinatal Simulation Scenarios

### SCENARIO OVERVIEW

#### Summary of case

Patient is a 29-year-old G5 P5, in LDR 1 hour after delivering a 4 kg (8.8 lb) male infant. There is a large amount of blood noted on pad underneath the patient and her uterus is boggy. Patient's quantified blood loss during delivery was 500 mls. Patient hemorrhages 2000 mls total. End point of scenario is administration of blood products.

#### Progressive Complexity

- PEA/Cardiac arrest due to hypovolemia
- Blood transfusion reaction
- To OR for D&C, laceration repair or hysterectomy
- To Interventional Radiology for embolization
- Patient experiences DIC

#### Potential Systems Explored

- Activation of emergency response system
- Response time of blood bank
- Availability and accessibility of hemorrhage kit/cart

#### Length

15-25 minutes

#### Target group

- Multidisciplinary OB Team
- Physician or Midwife
- Charge Nurse
- Primary Nurse
- Secondary Nurse
- Anesthesia Provider
- Neonatal Team

#### Confederates

Father of baby or support person

## PERINATAL Postpartum Hemorrhage



### Perinatal Simulation Scenarios

#### LEARNING OBJECTIVES

##### General Learning Objectives

- Communicate effectively with patient/family
- Communicate effectively with team using crisis resource management skills
- Demonstrate safety initiatives including medication safety practices
- Demonstrate safety initiatives including workplace safety practices
- Maintain infection control standards

##### Scenario Specific Objectives

- Identify postpartum hemorrhage (>500 mls for vaginal delivery/>1000 ml for cesarean section)
- Prioritize care of patient with hemorrhage
- Perform interventions for postpartum hemorrhage according to hemorrhage protocol
- Quantify blood loss
- Initiate postpartum hemorrhage protocol
- Initiate massive transfusion protocol

##### Debriefing Overview

- Review learning objectives
- Review interventions for postpartum hemorrhage
- Review teamwork skills
- Review communication skills including use of SBAR
  
- What went well?
- What might have been done differently/better?
- Share key assessments and interventions/events
- What was learned that can be taken back to the real workplace?

## PERINATAL Postpartum Hemorrhage



### Perinatal Simulation Scenarios

#### LEARNER PREPARATION

##### Pre-session activity

- Review hemorrhage protocol
- Review CMQCC Toolkit:  
[http://www.cmqcc.org/ob\\_hemorrhage](http://www.cmqcc.org/ob_hemorrhage)

##### Briefing (patient story)

It is shift change. A G5 P5 patient delivered a 4 kg male infant vaginally approximately 1 hour ago. Currently, patient has a patent IV in her right arm of LR 1000 mls with 20 units of Oxytocin infusing at 50 ml/hr. Quantified blood loss at delivery was 500 mls.

##### Additional Information, Medical History

- Allergies: NKDA
- Medications: PCN
- OB History: G5 P5
- Wt: 90.9kg/200 lbs
- Past Surgical History:  
negative
- VS 1 hour ago: HR 84;  
RR 20; BP 110/70; T 98
- Glucose 116
- Hgb 8.8
- Hct 39
- HIV negative
- Plt 298
- Fundal height 2 fingerbreadths  
above umbilicus
- Lochia: large amount of bright  
red bleeding and moderate-sized  
clots
- Patient voided 15 minutes ago
- Social History:  
Family at bedside with newborn

## PERINATAL Postpartum Hemorrhage



### Perinatal Simulation Scenarios

#### EQUIPMENT PREPARATION

##### Equipment

- IV pump
- IV supplies/fluids
- Urinary catheterization supplies
- Hemorrhage cart
- Code Blue cart
- Pressure infusion equipment

##### Blood Products

- 4 - 6 Units Packed Red Blood Cells (PRBC)
- 4 Fresh Frozen Plasma (FFP)
- 1 Platelets (PLT)
- Blue pads with blood and perineal pads/napkins
- Vaginal packing
- Intrauterine tamponade device
- Fluid warmer
- Central line kit
- Sequential compression stockings
- OR Supplies for D&C, laceration repair, hysterectomy
- Interventional Radiology (IR) embolization equipment

##### Medications

- Oxytocin 60 units/Litre
- Methergine 0.2 mg IM
- Misoprostol 800 -1000 mcg PR
- Hemabate 250 mcg IM

##### Room Preparation

- Labor room
- OR
- Set up for cesarean section

##### Simulator Preparation

- Hybrid Simulation: Standardized Patient dressed in hospital gown and PROMPT simulator
- SimMan 3G dressed in hospital gown for OR case
- IV LR right arm at 50 ml/hr
- ID and allergy band
- Bloody pads under patient
- Simulated blood loss
- Use a balloon to simulate boggy fundus

# PERINATAL Postpartum Hemorrhage



## Perinatal Simulation Scenarios

### EVENTS / PROPOSED CORRECT TREATMENT

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li><input type="checkbox"/> Documentation:<br/>Electronic Patient Record/<br/>Emergency Hemorrhage Checklist</li> <li><input type="checkbox"/> Assess fundus</li> <li><input type="checkbox"/> Assess blood loss</li> <li><input type="checkbox"/> Massage fundus</li> <li><input type="checkbox"/> Call for help</li> <li><input type="checkbox"/> Communicate effectively<br/>with patient/family</li> </ul> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Communicate effectively<br/>with team</li> <li><input type="checkbox"/> Communicate with Blood Bank</li> <li><input type="checkbox"/> Consider cause:<br/>e.g. retained placenta (POC),<br/>lacerations/tears, DIC</li> <li><input type="checkbox"/> Bimanual massage</li> <li><input type="checkbox"/> Intrauterine tamponade device</li> <li><input type="checkbox"/> Type and Cross 2 units of PRBCs</li> <li><input type="checkbox"/> Attach 3-lead ECG</li> </ul> |
|--|--|

#### BLOOD LOSS BETWEEN 500 TO 1000ML AND/OR HR 100 TO 120

- \_\_\_ Call for Assistance
- \_\_\_ Hemorrhage Kit and Tamponade Device in Room
- \_\_\_ O2 @ 4-6 Liters
- \_\_\_ IV Second Line Start and Draw Labs
- \_\_\_ 2 Litres NS (Warm Fluids and/or Warm Patient)
- \_\_\_ Vitals Q 5 Minutes, Call Out and Record
- \_\_\_ Foley Cath (Record Initial Amount of Urine)

#### Give Meds As Needed For Atony and Record Dose

- \_\_\_ PITOCIN 60 Units/Litre
- \_\_\_ METHERGINE 0.2 IM X 1
- \_\_\_ CYTOTEC 1000 Mcg PR
- \_\_\_ HEMABATE 250 Mcg IM Q 15 Minutes
- \_\_\_ Use Tamponade Device NOW!!!

#### BLOOD LOSS GREATER THAN 1500ML OR HR OVER 120

##### Move Patient to OR and Notify Anesthesia

- \_\_\_ Activate OB Hemorrhage Protocol:  
4-6 PRBC/4FFP/1 PLT
- \_\_\_ Place in Trendelenberg
- \_\_\_ Blood/ Fluid Warmer
- \_\_\_ Keep Patient Warm  
(Patient Warming Device or Extra Blankets)
- \_\_\_ Vital Signs Q 5 Min and Total Fluids Q 15 Min
- \_\_\_ Labs: Ca/K/Bicarb/Lactic Acid/ABG/Repeat H/H  
Coags/Wall Clot
- \_\_\_ Get Crash Cart (If Not in OR)

##### Surgical Intervention Based On Cause

- \_\_\_ Tone: Tamponade Device or B-Lynch if Atony
- \_\_\_ Tissue: D & C if Retained Products
- \_\_\_ Trauma: Repair of Laceration if Trauma
- \_\_\_ Thrombin: Massive Transfusion  
(Recommend Factor VIIa) if DIC
- \_\_\_ Transfusion Begins: Ratio 4-6 PRBCS: 4 FFP: 1 PLTS

##### Advanced Interventions

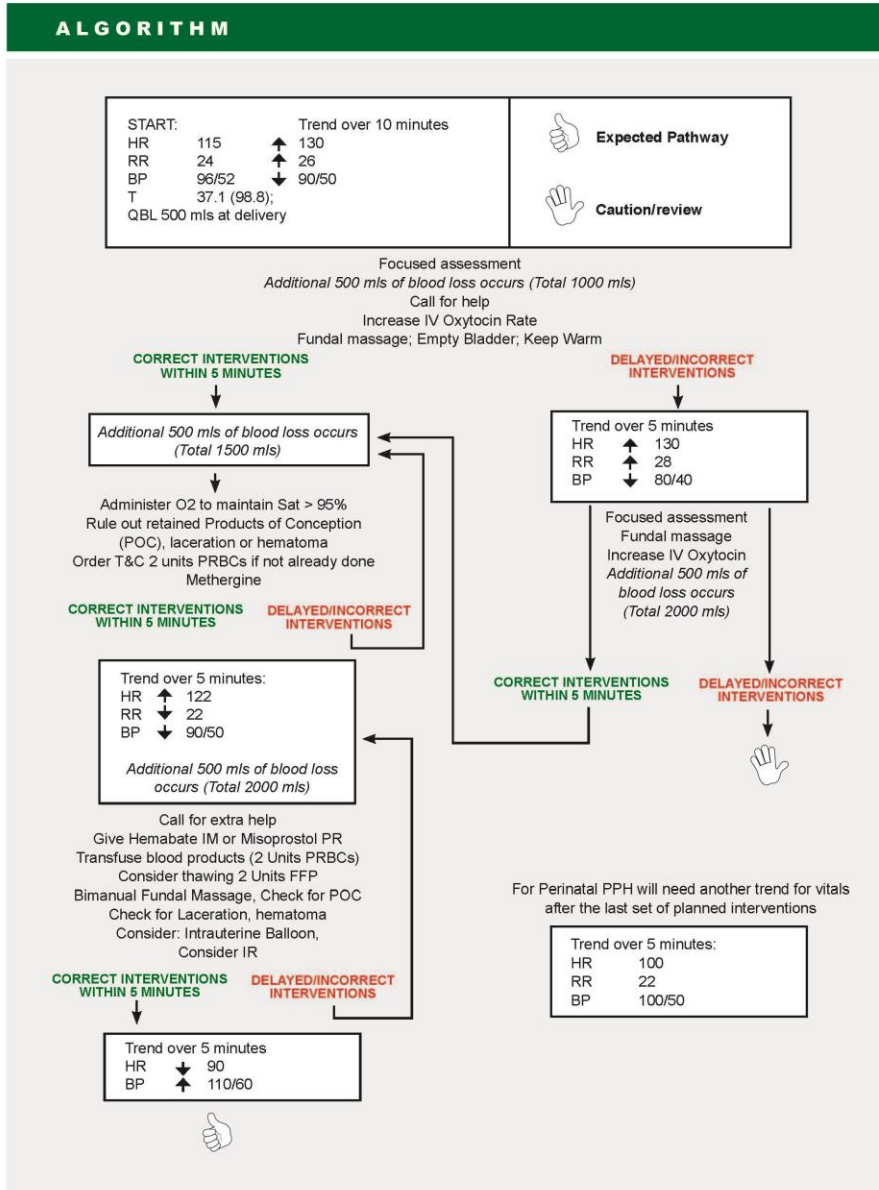
- \_\_\_ Call Interventional Radiology if Patient Stable
- \_\_\_ Laparotomy and Uterine Artery Ligation
- \_\_\_ Hysterectomy if Needed
- \_\_\_ Notify ICU Patient Will Need to Come Over

# PERINATAL Postpartum Hemorrhage



## Perinatal Simulation Scenarios

### ALGORITHM



## RECOGNITION & PREVENTION

There are three domains of Recognition and Prevention that should be implemented for every patient to reduce delays in care and maximize appropriate clinical planning and response.

### Recommendations for Every Patient:

- 1. Assessment of hemorrhage risk at multiple points in care**
  - Antepartum (consideration for need of transfer of care for highest risk patients)
  - Admission to Labor & Delivery
  - During Labor
  - Transfer to postpartum care
- 2. Measurement of cumulative blood loss with quantitative methods**
- 3. Active management of 3<sup>rd</sup> stage of labor**

Recognition and Prevention also require every facility to have a predefined system for identifying women in need of increased surveillance, treatment and care escalation.

### Every Unit

- 1. Establish a Maternal Early Warning System to trigger escalated care**

## Hemorrhage Risk Assessment

Risk assessment for obstetric hemorrhage should occur for every patient beginning with prenatal care and extending through the postpartum period. Adequate assessment of risk is at the cornerstone of preparing needed interventions, expertise and appropriate level of care to respond to potential degrees of hemorrhage. Hemorrhage risk can evolve for a patient over the course of her entire pregnancy as well as within minutes during a hospital admission and care providers should be prepared to continuously identify and respond to changes in risk level. Risk assessment guidelines should be incorporated into routine practice and where possible built into the electronic medical record for consistent documentation for every patient.

### Hemorrhage Risk Assessment Quality Measure

1. At the end of this quarter, what cumulative proportion of mothers had a hemorrhage risk assessment with risk level assigned, performed at least once between admission and birth and shared among the team?

#### Recommended Resources:

AIM eModule 2: Obstetric Hemorrhage Recognition & Prevention

<http://www.safehealthcareforeverywoman.org/aim-emodules-2.php>

CMQCC OB Hemorrhage Toolkit V 2.0

Risk Factor Assessment

<https://www.cmqcc.org/resources-tool-kits/toolkits/ob-hemorrhage-toolkit>

**Example Risk Assessment Tools:**



**Table 1: Pregnancy/Admission risk factors**

Low (Clot only)	Medium (Type and Screen)	High (Type and Crossmatch)
No previous uterine incision	Prior cesarean birth(s) or uterine surgery	Placenta previa, low lying placenta
Singleton pregnancy	Multiple gestation	Suspected placenta accreta, percreta, increta
≤ 4 previous vaginal births	> 4 previous vaginal births	Hematocrit < 30 <u>AND</u> other risk factors
No known bleeding disorder	Chorioamnionitis	Platelets < 100,000
No history of post partum hemorrhage	History of previous post partum hemorrhage	Active bleeding (greater than show) on admit
	Large uterine fibroids	Known coagulopathy

**Example Risk Assessment Tools:**  
**ACOG District II Safe Motherhood Initiative**

EXAMPLE

**OBSTETRIC HEMORRHAGE**  
**Risk Assessment Tables**

PRENATAL	
<b>RISK FACTORS</b>	<input type="checkbox"/> Suspected previa/accreta/increta/percreta <input type="checkbox"/> Pre-pregnancy BMI > 50 <input type="checkbox"/> Clinically significant bleeding disorder <input type="checkbox"/> Other significant medical/surgical risk <i>(consider patients who decline transfusion)<sup>1</sup></i>
<b>INTERVENTION</b>	<input type="checkbox"/> Transfer to appropriate level of care for delivery <sup>2</sup>

ANTEPARTUM		TIMING OF DELIVERY (WEEKS)
<b>RISK FACTORS</b>	<input type="checkbox"/> Placenta accreta <input type="checkbox"/> Placenta previa <input type="checkbox"/> Prior classical cesarean <input type="checkbox"/> Prior myomectomy <input type="checkbox"/> Prior myomectomy, if extensive	34 0/7 – 35 6/7 36 0/7 – 37 6/7 36 0/7 – 37 6/7 37 0/7 – 38 6/7 36-37
<b>PLACENTA ACCRETA MANAGEMENT<sup>3</sup></b>	For 1 or more prior cesareans, placental location should be documented prior to delivery. Patients at <b>high risk</b> for placenta accreta, should: <ul style="list-style-type: none"> <li><input type="checkbox"/> Obtain proper imaging to evaluate risk prior to delivery</li> <li><input type="checkbox"/> Be transferred to appropriate level of care for delivery if accreta is suspected</li> </ul>	

<sup>1</sup> See supplemental guidance document on patients who decline blood products

<sup>2</sup> Review availability of medical/surgical, blood bank, ICU, and interventional radiology support

<sup>3</sup> See supplemental guidance document on morbidly adherent placenta

EXAMPLE

## OBSTETRIC HEMORRHAGE Risk Assessment Tables

LABOR & DELIVERY ADMISSION		
	MEDIUM RISK	HIGH RISK
<b>RISK FACTORS</b>	<input type="checkbox"/> Prior cesarean, uterine surgery, or multiple laparotomies	<input type="checkbox"/> Placenta previa/low lying
	<input type="checkbox"/> Multiple gestation	<input type="checkbox"/> Suspected accreta/percreta
	<input type="checkbox"/> > 4 prior births	<input type="checkbox"/> Platelet count < 70,000
	<input type="checkbox"/> Prior PPH	<input type="checkbox"/> Active bleeding
	<input type="checkbox"/> Large myomas	<input type="checkbox"/> Known coagulopathy
	<input type="checkbox"/> EFW > 4000 g	<input type="checkbox"/> 2 or more medium risk factors
	<input type="checkbox"/> Obesity (BMI > 40)	/
	<input type="checkbox"/> Hematocrit < 30% & other risk	/
<b>INTERVENTION</b>	<input type="checkbox"/> <b>Type &amp; SCREEN, review protocol</b>	<input type="checkbox"/> <b>Type &amp; CROSS, review protocol</b>

INTRAPARTUM		
	MEDIUM RISK	HIGH RISK
<b>RISK FACTORS</b>	<input type="checkbox"/> Chorioamnionitis	<input type="checkbox"/> New active bleeding
	<input type="checkbox"/> Prolonged oxytocin > 24 hours	<input type="checkbox"/> 2 or more medium (admission and/or intrapartum) risk factors
	<input type="checkbox"/> Prolonged 2nd stage	/
	<input type="checkbox"/> Magnesium sulfate	/
<b>INTERVENTION</b>	<input type="checkbox"/> <b>Type &amp; SCREEN, review protocol</b>	<input type="checkbox"/> <b>Type &amp; CROSS, review protocol</b>

\* Establish a culture of huddles for high-risk patients and post-event debriefing \*

REVISED OCTOBER 2015

Safe Motherhood Initiative

Source: ACOG District II, Safe Motherhood Initiative

Maternal Early Warning Systems

Deaths from maternal hemorrhage are often preceded by delays in recognition, diagnosis and timely treatment of excess blood loss. The National Partnership for Maternal Safety as well as the Joint Commission support that every hospital have a predefined set of criteria representing early warning signs of a change in the patient’s status and when an escalation of care is required. Maternal early warning systems have been proposed specifically for the obstetric population and obstetric facilities. An effective system includes guidelines followed for every obstetric patient on surveillance, triggers for response and clear communication and care escalation strategies.<sup>5</sup> Facilities should also incorporate specific triggers for blood loss into their surveillance systems.

**Recommended Resources:** AIM eModule 1: Maternal Early Warning Systems ( MEWS)  
<http://www.safehealthcareforeverywoman.org/eModules/eModule-MEWS-1/presentation.html>

**The National Partnership for Maternal Safety: Maternal Early Warning Criteria<sup>5</sup>**

Systolic BP (mm Hg)	<90 or >160
Diastolic BP (mm Hg)	>100
Heart rate (beats per min)	<50 or >120
Respiratory rate (breaths per min)	<10 or >30
Oxygen saturation on room air, at sea level, %	<95
Oliguria, mL/hr for ≥2 hours	<35
Maternal agitation, confusion, or unresponsiveness; Patient with preeclampsia reporting a non-remitting headache or shortness of breath	

BP, blood pressure.  
 These triggers cannot address every possible clinical scenario that could be faced by an obstetric clinician and must not replace clinical judgment. As a core safety principle, bedside nurses should always feel comfortable to escalate their concerns at any point.

<sup>5</sup> Mhyre, J., D’Oria, R., et. al.; The Maternal Early Warning Criteria: A Proposal from the National Partnership for Maternal Safety. *Obstetrics & Gynecology*. 124(4): 82-876, October 2014

**CMQCC**

California Maternal  
Quality Care Collaborative

Source: CMQCC: Obstetric Hemorrhage Toolkit V 2.0: Recognition: Definition, Early

Recognition and Rapid Response Using Triggers

Table 1: Clinical Signs of Hypovolemia

Amount of Blood Loss	Clinical Signs
1000 mL	Slight change in blood pressure, heart rate normal, palpitations, respiratory rate normal, dizziness, normal urine output
1500 mL	Narrowed pulse pressure*, heart rate over 100, respiratory rate 20-30, diaphoretic, weak, urine output 20-30 mL/hr
2000 mL	Hypotension, narrowed pulse pressure, heart rate over 120, respiratory rate 30-40, pale, extremities cool, restlessness, urine output 5-15 mL/hr
≥ 2500 mL	Profound hypotension, heart rate over 140, respiratory rate over 40, slight urine output or anuria

\*Pulse pressure is the difference between the systolic and diastolic blood pressure. With hemorrhage a rise in the diastolic pressure reflects vasoconstriction and narrows the pulse pressure.<sup>4,11</sup>

## Quantification of Blood Loss

The accuracy in the estimation of actual blood loss during birth and the postpartum period can significantly contribute to delayed response that can result in preventable morbidity or death. Studies have indicated that visual estimation of blood loss can underestimate blood loss by as much as 50%. Accurate assessment allows for the recognition of potentially life-threatening hemorrhage and managing blood product replacement and treatment response.<sup>6</sup>

Two complimentary strategies can be employed:

1. Collection of blood in measurement containers
  - a. Calibrated under-buttocks drapes for vaginal delivery
  - b. Calibrated canisters for cesarean delivery
2. Weighing blood soaked items from delivery room, OR and throughout hemorrhage

Detailed guidelines for implementing quantification of blood loss strategies (QBL) can be found in existing toolkits. Implementation should involve a multidisciplinary approach that utilizes regular training, automated calculation tools to ensure accuracy and consistency across every patient.

### Quantification of Blood Loss Quality Measure

In this quarter, what proportion of mothers had measurement of blood loss from birth through the recovery period using quantitative and cumulative techniques?

#### **Recommended Resources:**

**AIM eModule 2:** Recognition & Prevention

<http://www.safehealthcareforeverywoman.org/eModules/eModule-2-Recognition/presentation.html>

#### **AWHONN Postpartum Hemorrhage Project:**

- Quantification of Blood Loss Video:  
<http://www.safehealthcareforeverywoman.org/eModules/eModule-2-Recognition/presentation.html>
- Quantification of Blood Loss, Practice Brief Number 1 (see appendix)  
[http://www.jognn.org/article/S0884-2175\(15\)31768-8/fulltext](http://www.jognn.org/article/S0884-2175(15)31768-8/fulltext)

#### **CMQCC: Obstetric Hemorrhage Toolkit V 2.0- Cumulative Quantitative Assessment of Blood Loss**

(see appendix) <https://www.cmqcc.org/resource/ob-hem-cumulative-quantitative-assessment-blood-loss>

#### **FPQC: Obstetric Hemorrhage Initiative** <http://health.usf.edu/publichealth/chiles/fpgc/OHI.htm>

**Free Online course: Quality Improvement in Obstetric Hemorrhage Management.** 1 CME/ 1.25 AMA  
Lee Memorial Health System's [Tips and Tricks on Quantification of Blood Loss After Vaginal Birth video](#)

<sup>6</sup> AIM eModule 2, Obstetric Hemorrhage Recognition.

<http://www.safehealthcareforeverywoman.org/eModules/eModule-2-Recognition/presentation.html>

**Example Quantification of Blood Loss Charts and Learning Aids**

Source: Florida Perinatal Quality Collaborative


## Postpartum Hemorrhage Quantification of Blood Loss

### Procedure for Quantification of Blood Loss (QBL)


- Weigh all bloody items in grams
- Subtract dry weights in grams
- Remaining weight in grams = ml blood loss

**1 gram = 1 ml**

### Dry Weights

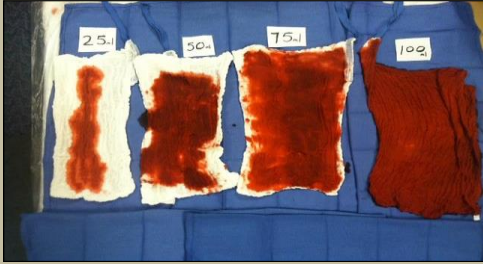


Xtra Absorb Pad	130 g
Blue Chux	20 g
Lg Sanitary Pad	77 g
Sm Sanitary Pad	12 g
Lap Sponge	21 g
Mini Lap Sponge	7 g
Raytex 4x4	5 g
Blue Towel	55 g



Use of a calibrated under the buttocks drape clearly shows an amount of 275 ml of blood loss.

### Visual Estimation of Blood Loss

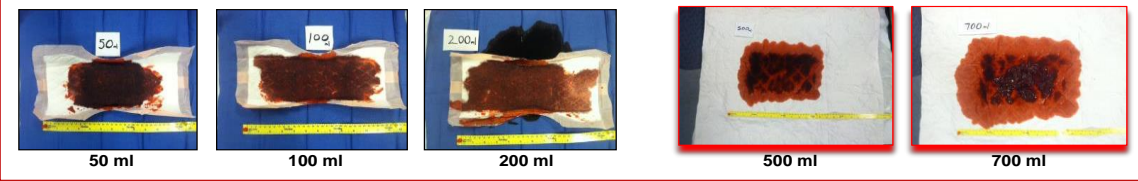


25 ml blood saturates about 50% area

50 ml blood saturates about 75% area

75 ml blood saturates entire surface

100 ml blood will saturate entire lap and drip



50 ml

100 ml

200 ml

500 ml

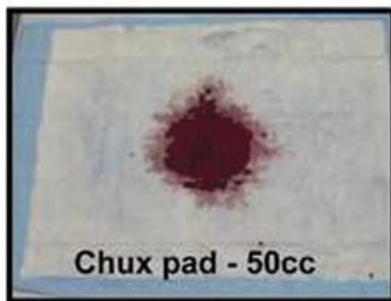
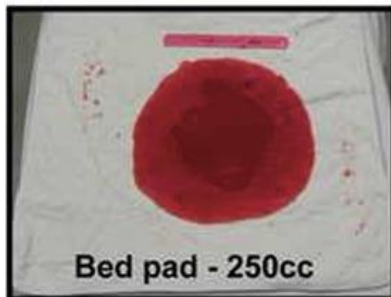
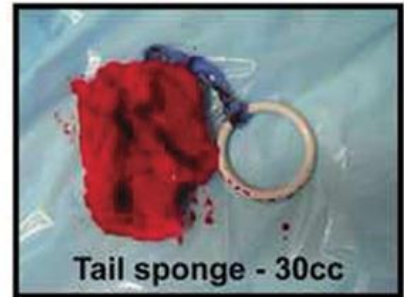
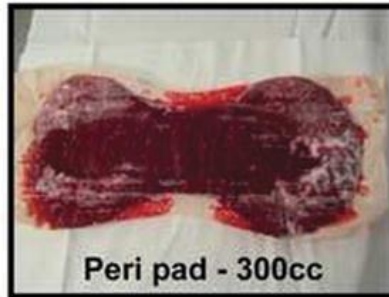
700 ml

Poster created by: Tricia Walton, RNC, BSN and Hedy Edmund, RNC, and the Florida Perinatal Quality Collaborative

\* Dry weights provided as an example. Each facility is encouraged to weigh its own commonly used sponges and pads.

Note: Visual aids and training can improve visual estimation of blood loss in situations where measured or quantified methods are not readily available. However, visual estimation remains less accurate than measured assessments. All facilities are encouraged to adopt a regular system to measure blood loss.

**Visual Estimation Pocket Card:**



Source: Zuckerwise LC, Pettker CM, Illuzzi J, Raab CR, Lipkind HS. Use of a novel visual aid to improve estimation of obstetric blood loss. *Obstet Gynecol.* 2014;123(5):982–986.

**Weighing Sponges Post Delivery**



Source: AIM eModule 2, Photos provided by Jill Mhyer, Jill McNulty, A. Scott MSN

## APPENDIX I: ROUTINE TWO STEP QUANTIFICATION OF BLOOD LOSS AT CESAREAN BIRTH

### Routine Two Step Quantification of Blood Loss at CS

#### 1 Suctioned blood

- a. Between delivery of infant and placenta;
  - i. OB suction drape of amniotic fluid
  - ii. Scrub staff directs Circulator to change suction tubing to second canister
  - iii. May omit switch to new canister if minimal amniotic fluid (patient is post AROM/SROM, in labor)
- b. Circulator records volume in second canister in spreadsheet calculator/EPIC calculator
  - i. Best to record before irrigation used OR
  - ii. If irrigation used and suctioned, Scrub staff communicates amount to Circulator to be subtracted from canister (but may lead to error if not all irrigation re-aspirated)
  - iii. Consider omitting irrigation use during routine cesarean section

#### 2 Lap sponges

- a. During case, bloody lap sponges passed off scrub table by Scrub staff
- b. Circulator places in hanging lap sleeve bags (5 sponges/sleeve)
- c. Circulator weighs bloody sponges and lap sleeve bags *all together* near end of case (sponges left in sleeves)
- d. Total weight, # sponges weighed, # hanging sleeves weighed, entered in spreadsheet calculator/EPIC calculator

#### 3 Spreadsheet calculator/EPIC calculator calculates QBL from entered data

Staff trained to account for other large sources of blood loss if indicated and add to QBL (examples: large amount expressed blood from uterus in emesis basin post op, large floor spill of blood, etc.)

## Active Management of Third Stage of Labor

The purpose of the active management of the third stage of labor (AMTSL) is to reduce postpartum blood loss and reduce the risk of postpartum hemorrhage. While AMTSL has originally included three components including administration of uterotonics, gentle controlled cord traction and uterine massage, recent evidence supports prophylactic intravenous oxytocin use as the primary method of reducing PPH. The benefit of the other components is less well supported by evidence. AMTSL is a prophylactic strategy and is distinct from the treatment of hemorrhage.

**Recommended Practice:** All facilities offer prophylactic oxytocin administration after birth for the prevention of postpartum hemorrhage with an established written administration protocol.

**Additional considerations:**

- Oxytocin is recommended as the first-line uterotonic agent and is the most important component of AMTSL.
- Early skin-to-skin and breastfeeding supports physiologic uterine tone and should not be delayed or denied to complete other component of AMTSL.
- Delayed cord clamping has not been demonstrated to increase the risk of maternal hemorrhage and AMTSL should not interfere with delayed cord clamping where appropriate. Postponing oxytocin administration until delayed cord clamping is complete does not increase the risk of hemorrhage.
- Appropriately counseled low-risk women who are experiencing a physiologic birth that make an informed choice to decline prophylactic oxytocin should be supported in their decision.

**Recommended Resources:**

AWHONN Guidelines for Oxytocin Administration After Birth, Practice Bulletin Number 2 (see appendix)  
[http://www.jognn.org/article/S0884-2175\(15\)31765-2/fulltext](http://www.jognn.org/article/S0884-2175(15)31765-2/fulltext)

CMQCC: Obstetric Hemorrhage Toolkit v 2.0 - Active Management of Third Stage of Labor  
<https://www.cmqcc.org/resource/ob-hem-active-management-third-stage-labor>

# RESPONSE

There are two key response interventions that should be utilized with every hemorrhage.

## Recommendations for every case of hemorrhage:

1. **A unit-standard stage-based obstetric hemorrhage emergency management plan. Including:**
  - a. Triggering events within each hemorrhage stage ~ Established Early Warning System
  - b. Formal response teams
  - c. Communication plan for activation
  - d. Necessary medications/equipment and tools
  - e. Multidisciplinary design
  - f. Drills/debriefs/reviews
  
2. **Support program for patients, family and staff for all significant hemorrhages.**

**Recommended Education:** AIM eModule 2: Obstetric Hemorrhage- Response

<http://www.safehealthcareforeverywoman.org/eModules/eModule-2-Response/presentation.html>

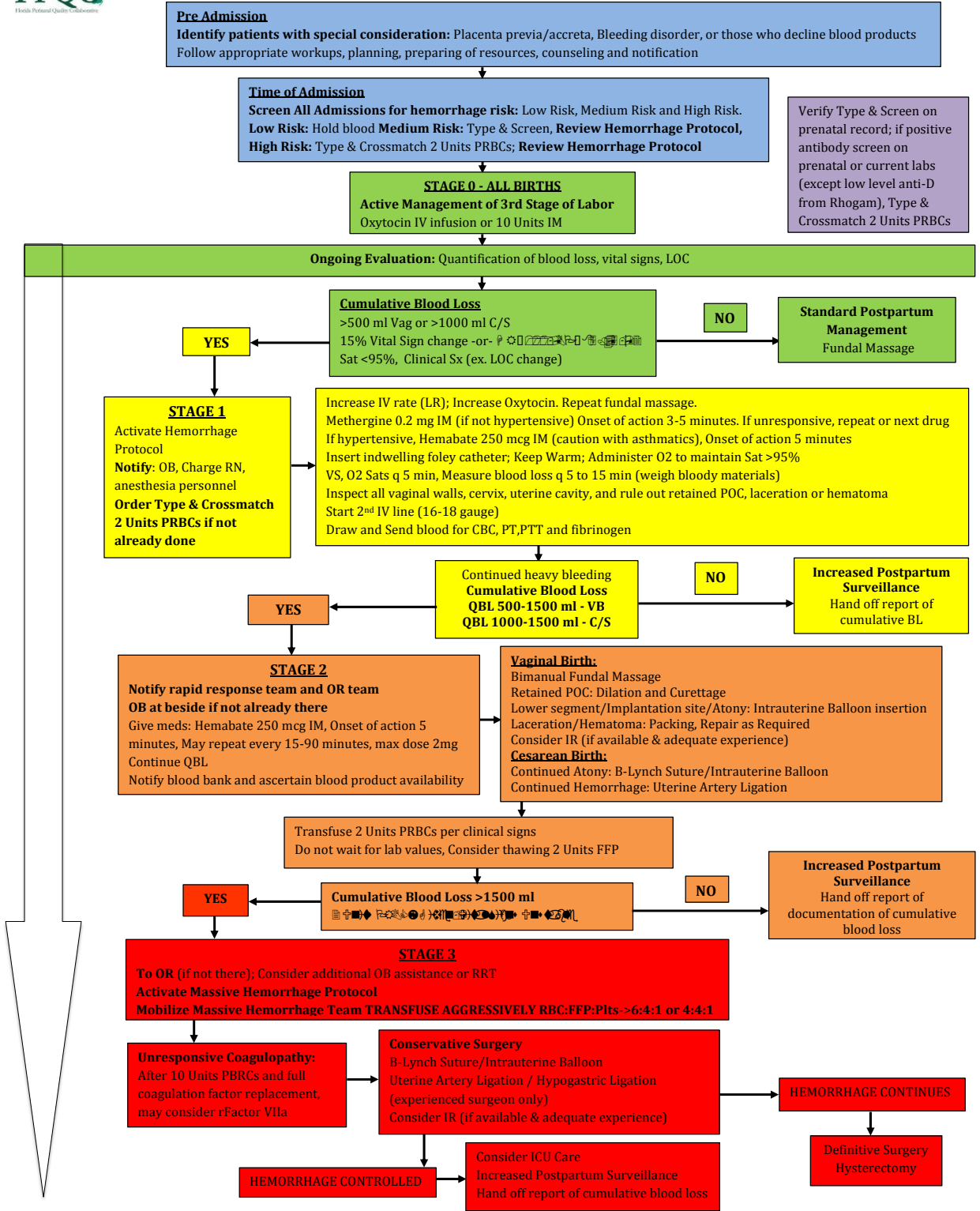
Example Obstetric Emergency Management Plans:

**CMOCC** CALIFORNIA MATERNAL QUALITY CARE COLLABORATIVE  
**Obstetric Hemorrhage Emergency Management Plan: Table Chart Format**  
version 2.0

	Assessments	Meds/Procedures	Blood Bank
<b>Stage 0</b>	<b>Every woman in labor/giving birth</b>		
<i>Stage 0 focuses on risk assessment and active management of the third stage.</i>	<ul style="list-style-type: none"> <li>Assess every woman for <b>risk factors</b> for hemorrhage</li> <li>Measure <b>cumulative quantitative blood loss</b> on every birth</li> </ul>	<b>Active Management 3<sup>rd</sup> Stage:</b> <ul style="list-style-type: none"> <li><b>Oxytocin</b> IV infusion or 10u IM</li> <li><b>Fundal Massage</b>- vigorous, <u>15 seconds min.</u></li> </ul>	<ul style="list-style-type: none"> <li>If <b>Medium Risk</b>: T &amp; Scr</li> <li>If <b>High Risk</b>: T&amp;C 2 U</li> <li>If <b>Positive Antibody Screen</b> (prenatal or current, exclude low level anti-D from RhoGam):T&amp;C 2 U</li> </ul>
<b>Stage 1</b>	<b>Blood loss: &gt; 500ml vaginal or &gt;1000 ml Cesarean, or VS changes (by &gt;15% or HR <math>\geq</math> 110, BP <math>\geq</math> 85/45, O2 sat &lt;95%)</b>		
<i>Stage 1 is short: activate hemorrhage protocol, initiate preparations and give Methergine IM.</i>	<ul style="list-style-type: none"> <li>Activate OB Hemorrhage Protocol and Checklist</li> <li>Notify Charge nurse, OB/CNM, Anesthesia</li> <li>VS, O2 Sat q5'</li> <li>Record <b>cumulative</b> blood loss q5-15'</li> <li><b>Weigh</b> bloody materials</li> <li>Careful inspection with <u>good exposure</u> of vaginal walls, cervix, uterine cavity, placenta</li> </ul>	<ul style="list-style-type: none"> <li><b>IV Access:</b> at least 18gauge</li> <li>Increase IV fluid (LR) and <b>Oxytocin</b> rate, and repeat <b>fundal massage</b></li> <li><b>Methergine</b> 0.2mg IM (if not hypertensive) May repeat if good response to first dose, BUT otherwise <b>move on</b> to 2<sup>nd</sup> level uterotonic drug (see below)</li> <li>Empty bladder: straight cath or place foley with urimeter</li> </ul>	<ul style="list-style-type: none"> <li><b>T&amp;C 2 Units PRBCs</b> (if not already done)</li> </ul>
<b>Stage 2</b>	<b>Continued bleeding with total blood loss under 1500ml</b>		
<i>Stage 2 is focused on sequentially advancing through medications and procedures, mobilizing help and Blood Bank support, and keeping ahead with volume and blood products.</i>	<ul style="list-style-type: none"> <li><b>OB back to bedside</b> (if not already there)</li> <li><b>Extra help:</b> 2<sup>nd</sup> OB, Rapid Response Team (per hospital), assign roles</li> <li>VS &amp; <b>cumulative</b> blood loss q 5-10 min</li> <li>Weigh bloody materials</li> <li><b>Complete evaluation</b> of vaginal wall, cervix, placenta, uterine cavity</li> <li>Send additional labs, including DIC panel</li> <li>If in Postpartum: Move to L&amp;D/OR</li> <li>Evaluate for special cases: <ul style="list-style-type: none"> <li>-Uterine Inversion</li> <li>-Amn. Fluid Embolism</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><b>2<sup>nd</sup> Level Uterotonic Drugs:</b> <ul style="list-style-type: none"> <li><b>Hemabate</b> 250 mcg IM <u>or</u></li> <li><b>Misoprostol</b> 800 mcg SL</li> </ul> </li> <li><b>2<sup>nd</sup> IV Access</b> (at least 18gauge)</li> <li>Bimanual massage</li> <li><b>Vaginal Birth:</b> (typical order) <ul style="list-style-type: none"> <li>Move to OR</li> <li>Repair any tears</li> <li>D&amp;C: r/o retained placenta</li> <li>Place intrauterine balloon</li> <li>Selective Embolization (Interventional Radiology)</li> </ul> </li> <li><b>Cesarean Birth:</b> (still intra-op) (typical order) <ul style="list-style-type: none"> <li>Inspect broad lig, posterior uterus and retained placenta</li> <li>B-Lynch Suture</li> <li>Place intrauterine balloon</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><b>Notify Blood Bank of OB Hemorrhage</b></li> <li><b>Bring 2 Units PRBCs to bedside, transfuse per clinical signs – do not wait for lab values</b></li> <li>Use blood warmer for transfusion</li> <li>Consider thawing 2 FFP (takes 35+min), use if transfusing &gt; 2u PRBCs</li> <li>Determine availability of additional RBCs and other Coag products</li> </ul>
<b>Stage 3</b>	<b>Total blood loss over 1500ml, or &gt;2 units PRBCs given or VS unstable or suspicion of DIC</b>		
<i>Stage 3 is focused on the Massive Transfusion protocol and invasive surgical approaches for control of bleeding.</i>	<ul style="list-style-type: none"> <li><b>Mobilize team</b> <ul style="list-style-type: none"> <li>-Advanced GYN surgeon</li> <li>-2<sup>nd</sup> Anesthesia Provider</li> <li>-OR staff</li> <li>-Adult Intensivist</li> </ul> </li> <li><b>Repeat labs</b> including coags and ABG's</li> <li>Central line</li> <li>Social Worker/ family support</li> </ul>	<ul style="list-style-type: none"> <li><b>Activate Massive Hemorrhage Protocol</b></li> <li>Laparotomy: <ul style="list-style-type: none"> <li>-B-Lynch Suture</li> <li>-Uterine Artery Ligation</li> <li>-Hysterectomy</li> </ul> </li> <li>Patient support <ul style="list-style-type: none"> <li>-Fluid warmer</li> <li>-Upper body warming device</li> <li>-Sequential compression stockings</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><b>Transfuse Aggressively</b> Massive Hemorrhage Pack <ul style="list-style-type: none"> <li>Near 1:1 PRBC:FFP</li> <li>1 PLT apheresis pack per 4-6 units PRBCs</li> </ul> </li> <li><b>Unresponsive Coagulopathy:</b> <ul style="list-style-type: none"> <li>After 8-10 units PRBCs and full coagulation factor replacement: may consult re rFactor VIIa risk/benefit</li> </ul> </li> </ul>



# OBSTETRIC HEMORRHAGE GUIDELINES ALGORITHM



Thanks to Tricia Walton, RNC, BSN from Florida Hospital Tampa for assistance in developing the graphic.

References: Lyndon et al 2010; ACOG 2006; Berkowitz and Bernstein 2012; Shields et al 2011

# Obstetric Hemorrhage Checklist

EXAMPLE

Complete all steps in prior stages plus current stage regardless of stage in which the 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

**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 and Crossmatch 2 units RBCs

**ACTION:**

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

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

**Methylergonovine (Methergine):**  
0.2 milligrams IM

**15-methyl PGF<sub>2</sub>α (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 SL

**Tone** (i.e., atony)  
**Trauma** (i.e., laceration)  
**Tissue** (i.e., retained products)  
**Thrombin** (i.e., coagulation dysfunction)

**STAGE 2: CONTINUED BLEEDING (EBL up to 1500mL 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**



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**STAGE 3: CONTINUED BLEEDING (EBL > 1500mL OR > 2 RBCs given OR 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 and 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, intervention based on etiology

**Oxytocin (Pitocin):**

10-40 units per 500-1000mL solution

**Methylergonovine (Methergine):**

0.2 milligrams IM

**15-methyl PGF<sub>2</sub>α (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 SL

**STAGE 4: CARDIOVASCULAR COLLAPSE (massive hemorrhage, profound hypovolemic shock, or amniotic fluid embolism)**

**INITIAL STEP:**

- Mobilize additional resources

**MEDICATIONS:**

- ACLS

**BLOOD BANK:**

- Simultaneous aggressive massive transfusion

**ACTION:**

- Immediate surgical intervention to ensure hemostasis (hysterectomy)

**Post-Hemorrhage Management**

- Determine disposition of patient
- Debrief with the whole obstetric care team
- Debrief with patient and family
- Document

**Example Medication and Transfusion Guidelines:  
CMQCC: Uterotonic Agents for Postpartum Hemorrhage**

<b>UTEROTONIC AGENTS for POSTPARTUM HEMORRHAGE</b>					
Drug	Dose	Route	Frequency	Side Effects	Storage
<b>Pitocin®</b> (Oxytocin) 10 units/ml	10-40 units per 500-1000 ml, rate titrated to uterine tone	IV infusion	Continuous	Usually none Nausea, vomiting, hypotatremia ("water intoxication") with prolonged IV admin. ↓ BP and ↑ HR with high doses, esp IV push	Room temp
<b>Methergine®</b> (Methylergonovine) 0.2 mg/ml	0.2 mg	IM (not given IV)	-Q 2-4 hours -If no response after first dose, it is unlikely that additional doses will be of benefit.	Nausea, vomiting Severe hypertension, esp. if given IV, which is not recommended	Refrigerate Protect from light
<b>Hemabate®</b> (15-methyl PG F2a) 250 mcg/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	Refrigerate
<b>Cytotec®</b> (Misoprostol) 100 or 200 mcg tablets	600-800 mcg	Sublingual or oral	One time	Nausea, vomiting, diarrhea Shivering, Fever (transient) Headache	Room temp

<b>BLOOD PRODUCTS</b>	
<b>Packed Red Blood Cells (PRBC)</b> (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
<b>Fresh Frozen Plasma (FFP)</b> (approx. 35-45 min. to thaw for release)	Highly desired if > 2 units PRBCs given, or for prolonged PT, PTT 1 unit = 180 ml volume
<b>Platelets (PLTs)</b> 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 k transient increase in platelets
<b>Cryoprecipitate (CRYO)</b> (approx. 35-45 min. 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 don't need volume replacement Caution: 10 units come from 10 different donors, so infection risk is proportionate.

Page 5 of 5 Copyright California Department of Public Health, 2014; supported by Title V funds. Developed in partnership with California Maternal Quality Care Collaborative Task Force. Visit [www.cdph.ca.gov](http://www.cdph.ca.gov) for more details

## UTERINE TAMPONADE FOR OBSTETRIC HEMORRHAGE: INTERNAL BALLOONS AND EXTERNAL COMPRESSION STITCHES

Jennifer McNulty MD, Long Beach Memorial Medical Center  
Elliott Main MD, California Maternal Quality Care Collaborative and California Pacific Medical Center

### EXECUTIVE SUMMARY

- Uterine tamponade can be a simple and effective intervention for bleeding from the placental implantation site.
- WHO recommends the use of uterine balloon tamponade for treatment of uterine atony-related hemorrhage in situations where uterotonics have not been effective or are not available.
- Uterine balloon insertion and compression suture procedures should be practiced by the clinical team to ensure understanding of the sequence of steps and availability of necessary supplies and equipment.
- The potential for concealed intra-abdominal bleeding must be kept in mind. It is essential to carefully inspect for unrepaired lacerations prior to balloon placement and to monitor vital signs closely after placement, even when visible bleeding is reduced or eliminated.
- For training provider and nursing staff, we recommend sharing this chapter, watching the video and practicing during a drill or simulation.

For complete resource see: CMQCC Obstetric Hemorrhage Toolkit Version 2.0

<https://www.cmqcc.org/resource/ob-hem-uterine-tamponade-ob-hem-internal-balloons-and-external-compression-stitches>

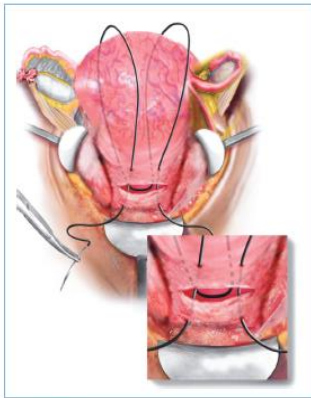
#### Additional Resources:

ACOG District II Safe Motherhood Initiative: <https://www.acog.org/-/media/Districts/District-II/Public/SMI/v2/HEMPosterSurgicalManagement.pdf?dmc=1&ts=20161108T2215318249>

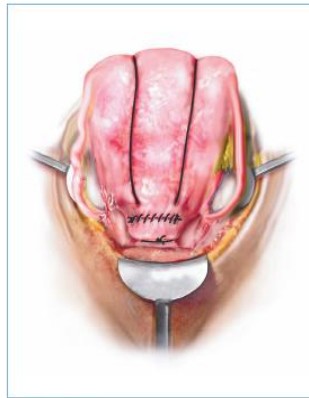
## Example Surgical Management Visual Aids

EXAMPLE

OBSTETRIC HEMORRHAGE  
**Surgical Management**



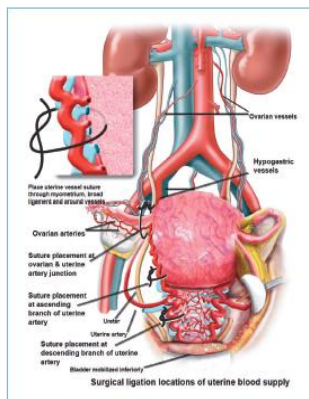
B-Lynch suture



B-Lynch suture



Hayman uterine compression suture



Surgical ligation locations of uterine blood supply

Used with permission from:  
*Female Pelvic Surgery Video Atlas Series*, Mickey Karam, Series Editor  
*Management of Acute Obstetric Emergencies*, Baha Sibai, MD (Copyright © 2011 by Saunders)

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Safe Motherhood Initiative

**Example Intrauterine Balloon Technique:**

## Tamponade Technique for Postpartum Hemorrhage

Refer to the instructions for use for complete information on product usage and proper indications and contraindications.

### 1 Evaluating and Monitoring the Patient

- Assess the patient's postpartum hemorrhage and its causes.
- Determine possible contraindications to the use of the Bakri Postpartum Balloon.
- Confirm that the uterus is free of placental attachments or fragments and that there are no lacerations.
- Evaluate the patient for:
  - Vital signs
  - Pallor
  - Blood pressure
  - Urine output
  - Uterine tone
  - Active and total blood loss
  - Pulmonary function
  - Hematocrit level
  - General patient condition (shock)
- Continue monitoring the patient carefully throughout the process.

### 2 Determining Uterine Volume

- Estimate the uterine cavity's volume by direct or ultrasound examination.
- Place the predetermined volume of sterile fluid in a separate container. Do not rely on a syringe count to verify the volume.
- If using SOS-R, note the predetermined volume for rapid instillation.
- The maximum balloon volume is 500 mL.

### 3 Inserting the Balloon

#### Transvaginal Placement, Postvaginal Delivery (See Fig. 1)

- Insert the balloon portion of the catheter into the uterus, making certain that the entire balloon is inserted past the cervical canal and internal osium.

#### Transabdominal Placement, Postcesarean Delivery (See Fig. 2)

- Pass the uninflated balloon, inflation port first, through the incision into the uterus and cervix. Remove the stopcock to facilitate placement, if desired.
- Have an assistant pull the balloon shaft through the vaginal canal until the base contacts the internal cervical osium.
- Close the incision, being careful not to puncture the uninflated balloon with the suture.

### 4 Filling the Balloon with Sterile Liquid

- Never inflate with air, carbon dioxide or any other gas.
- Do not fill with more than 500 mL. Over-inflation may result in the balloon being displaced into the vagina.
- Ensure that all product components are intact and that the hysterotomy is securely sutured prior to inflating the balloon.

- Place a Foley catheter in the patient's bladder to collect urine and monitor urine output.
- Using the enclosed syringe, or rapid instillation components, fill the balloon to the predetermined volume through the stopcock.
- Traction may be applied to the balloon shaft to ensure proper contact between the balloon and the tissue surface by securing the balloon shaft to the patient's leg or attaching it to a weight (not to exceed 500 g).
- Use ultrasound to confirm proper placement of the balloon once the balloon is inflated to the predetermined volume.

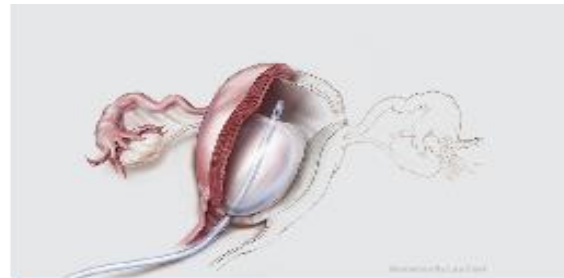
### 5 Flushing the Lumen and Monitoring Hemostasis

- Flush the balloon drainage port and tubing with sterile isotonic saline to clear clots. (The appropriate volume of saline and frequency of flushing should be determined by attending medical staff.)
- Connect the drainage port to a fluid collection bag to monitor hemostasis.
- Monitor the patient for signs of increased bleeding and uterine cramping.
- Continue evaluating the patient for the signs listed in Step 1.

### 6 Removing the Balloon

- Maximum indwelling time: 24 hours.
- The timing of balloon removal should be determined by the attending clinician upon evaluation of the patient once bleeding has been controlled and the patient is stable.

- Release the tension on the shaft and remove any vaginal packing.
- Aspirate balloon contents until the balloon is completely empty.
- Gently retract the balloon and discard it.
- Monitor the patient for signs of bleeding.



Bakri®  
 POSTPARTUM BALLOON WITH RAPID INSTILLATION COMPONENTS

#### Illustrations for Inserting the Bakri Balloon (Step 3)

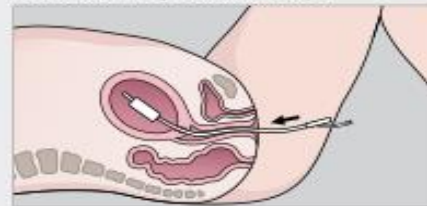


Fig. 1. Transvaginal Placement, Postvaginal Delivery

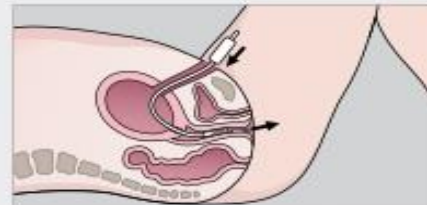
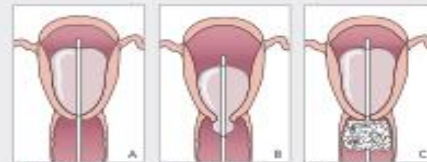


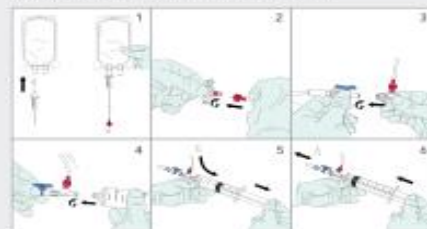
Fig. 2. Transabdominal Placement, Postcesarean Delivery

#### Explanation of Proper Placement



- |  |   |   |
|--|---|---|
| <p><b>Proper Placement:</b></p> <ul style="list-style-type: none"> <li>Make sure that the entire balloon is inserted past the cervical canal and internal osium.</li> <li>Use ultrasound to confirm proper placement of the balloon once the balloon is inflated to the predetermined volume.</li> </ul> | <p><b>If the Balloon Becomes Displaced:</b></p> <ul style="list-style-type: none"> <li>Empty and deflate the balloon.</li> <li>Reposition the balloon in the uterus. (Reference illustration A for details.)</li> <li>Refill as indicated in Step 4.</li> </ul> | <p><b>To Prevent Displacement:</b></p> <ul style="list-style-type: none"> <li>If necessary, pack the vagina with iodine- or antibiotic-soaked gauze.</li> <li>Do not extend the packing into the uterus.</li> </ul> |
|--|---|---|

#### Steps for the Use of Rapid Instillation Components



Severe maternal hemorrhage can be a traumatic event for everyone involved including the patient, her family and members of the care team. Women and their families require emotional support before, during and after severe maternal events. Communication is critical, including providing the opportunity for women and families to know what happened during the event and why and to be listened to and have their experience acknowledge. Similarly, unexpected severe events and outcomes can have a significant emotional impact on clinical staff and require additional support.

**Recommendation:** All healthcare facilities include in their obstetric emergency plans, resources and guidelines for providing support to patients, families and clinical staff.

Patient, Family & Staff Support Quality Measure

At the completion of the project period, has your hospital developed OB specific resources and protocols to support patients, family and staff through major OB complications?

**Recommended Resources:**

**ACOG District II Safe Motherhood Initiative:** Support for Patients, Families, Staff

<https://www.acog.org/-/media/Districts/District-II/Public/SMI/v2/PST-zs-03-AF-140519-BereavementResources.pdf>

**Medically Induced Trauma Support Services.** Tools for Building a Clinician and Staff Support program.

<http://www.mitsstools.org/tool-kit-for-staff-support-for-healthcare-organizations.html>

**Council on Patient Safety in Women's Healthcare:** Patient Safety Bundle- Patient, Family and Staff Support after a Severe maternal Event ( see appendix)

<http://www.safehealthcareforeverywoman.org/secure/patient-and-family-support-after-maternal-event-bundle.php>

Example Patient, Family, Staff Support Tool- ACOG District II- Safe Motherhood Initiative

**MATERNAL SAFETY BUNDLE**

**Tool for Staff after Severe Morbidity or Maternal Death**

**STEP 1 CLINICAL CARE:**

- Assure patient stability
- Call for support for care of other patients & provider support (colleagues and leadership)
- Call for patient/family support and comfort (social worker, clergy, other staff member)

**STEP 2a PLAN INITIAL PATIENT/FAMILY MEETING:**

**GATHER THE FACTS AND DEBRIEF:**

- Review all medical records
- Review with other health care providers who were involved
- Clarify and understand the facts
- Avoid speculation and blame
- Assess cultural/religious practices and prep team

**WHO SHOULD ATTEND THE MEETING:**

- Patient and patient approved family members
- Other health care providers directly involved
- Skilled communicators, if needed
- Non-family member translator
- Meet any special needs of your patient
- Decide who will lead the discussion

**LOCATION OF MEETING:**

- Set the time and place for the meeting as soon as possible
- Choose a setting where you can meet face to face, seated
- Find a comfortable environment with confidentiality/privacy



## MATERNAL SAFETY BUNDLE

# Tool for Staff after Severe Morbidity or Maternal Death

### STEP 2b PLANNING WHAT TO SAY:

#### ORGANIZE YOUR THOUGHTS AND CONSIDER HOW YOU WILL:

- Manage your own emotions (but don't be afraid to show sorrow)
- Acknowledge that something unexpected has happened
- Express your concern and regret
- Respond to your patient's emotional reactions
- Respond to questions your patient is likely to ask
- Explain the process for any analysis of the adverse event

### STEP 3 INITIAL PATIENT/FAMILY MEETING:

#### DURING MEETING:

- Find out what your patient/family already knows
- Acknowledge patient suffering and convey empathy
- Set agenda for the meeting
- Present the existing facts
- Describe clinical condition as it now exists
- Describe any future care requirements
- Express your concern and regret as appropriate
- Try not to overload with too much information
- Repeat key aspects, if needed
- Communicate in a clear, sensitive, and empathetic manner
- Welcome note taking, support persons, and questions
- Discuss how seriously you are taking the situation

#### END OF MEETING:

- Confirm the clinical next steps
- Summarize the discussion
- Test for understanding of information with open-ended questions
- Define what the next steps will be in process
- Answer any questions about how/why the event occurred
- Provide contact information
- Arrange a follow-up meeting



## MATERNAL SAFETY BUNDLE

# Tool for Staff after Severe Morbidity or Maternal Death

### STEP 4 FOLLOW UP AND RECOVERY:

#### PATIENT/FAMILY:

- Keep patient and family aware of patient condition
- Continue to provide clinical and emotional support
- Ask what resources patient/family is using
- Provide resources for patient/family (religious, social, cultural as needed)
- Convey newly uncovered facts to your patient
- Discuss what steps have been taken to prevent similar harm
- Provide a further expression of regret

#### PROVIDERS:

- Inform Risk Management
- Inform primary providers of patient condition
- Arrange appropriate emotional support for all those involved
- Document the clinical care and discussions in a factual way

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#### Modified from:

Obstetric Communication Response Team (OCRT) Checklist, Montefiore Medical Center, 2014

Checklist for Disclosure. The Canadian Medical Protective Association (CMPA) 2008.

[http://www.cmpa-acpm.ca/cmpapd04/docs/resource\\_files/ml\\_guides/disclosure/checklist/index-e.html](http://www.cmpa-acpm.ca/cmpapd04/docs/resource_files/ml_guides/disclosure/checklist/index-e.html)

Guidelines for Disclosure after an Adverse Event. Institute for Professionalism & Ethical Practice. The Risk Management Foundation of the Harvard Medical Institutions, Inc. 2009

[https://www.rmfi.harvard.edu/-/media/Files/\\_Global/KC/PDFs/adverse\\_event\\_guidelines.pdf](https://www.rmfi.harvard.edu/-/media/Files/_Global/KC/PDFs/adverse_event_guidelines.pdf)

Disclosure and discussion of adverse events. Committee Opinion No. 520. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2012;119:686–9.

# REPORTING/SYSTEMS LEARNING

There are three key domains of reporting and systems learning that every facility providing obstetric care should establish. These domains are focused upon learning from severe obstetric events in order to generate system-wide improvements.

**Recommendation:**

Every Unit:

1. Establish a culture of huddles for high-risk patients and post event debriefs to identify successes and opportunities.
2. Multidisciplinary review of serious hemorrhages for systems issues
3. Monitor outcomes and process metrics in a facility-based perinatal quality improvement committee

**Recommended Education:**

AIM eModule2: Obstetric Hemorrhage- Reporting

<http://www.safehealthcareforeverywoman.org/eModules/eModule-2-Reporting/presentation.html>

A culture of briefs, huddles and debriefs will provide obstetric teams with the opportunity to identify successes and opportunities for improvement after significant hemorrhage events. Briefs, huddles and debriefs improve role clarity, situational awareness and utilization of available resources. They should become a part of the routine culture for the unit.

### Obstetric Hemorrhage Debrief Quality Measures

1. **At the project completion: Has your hospital established a system in your hospital to perform regular formal debriefs after cases with major complications?**
2. **Monthly: Proportion of obstetric hemorrhages that are followed by a debrief with key staff.**

**Briefs** are planning meetings that aim to:

1. Form the team
2. Designate roles and responsibilities
3. Establish goals
4. Engage the entire team in planning, including patients

**Huddles** are brief ad-hoc meetings that aim to:

1. Regain situational awareness and express team concerns
2. Discuss critical issues
3. Anticipate outcomes
4. Assign resources

**Debriefs** are feedback sessions that occur shortly after events including the involved care team.

Debriefs aim to:

1. Identify opportunities to improve teamwork, skills and outcomes

### **Recommended Resources:**

CMQCC: Obstetric Hemorrhage Toolkit Version 2.0- Appendix C: Debriefing Tool

<https://www.cmqcc.org/resources-tool-kits/toolkits/ob-hemorrhage-toolkit>

ACOG District II Safe Motherhood Initiative: Obstetric Debriefing Form

<https://www.acog.org/-/media/Districts/District-II/Public/SMI/v2/PST-zs-02-AF-140513-DebriefingForm.pdf>

**Example Debriefing Tools:**



CMQCC OBSTETRIC HEMORRHAGE TOOLKIT  
Version 2.0  
3/24/15

**APPENDIX C: DEBRIEFING TOOL**

**Directions:** Form is to be completed immediately after patient situation by the designated team member. After completion, the form is given to \_\_\_\_\_ (designated by unit/hospital). After the debrief, team members who want to provide additional input are encouraged to complete an incident report.

**Goal:** Allow team a debrief mechanism to talk immediately about a patient care situation to capture what went well, what could have been done better and what prevented the team from caring for the patient effectively.

Patient Name: \_\_\_\_\_ Form completed by: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_

Team members attending debriefing (Print Names):

	Yes	No	
<b>Team Attendance</b>			<b>Comments</b>
1. Help arrived in a timely manner	<input type="checkbox"/>	<input type="checkbox"/>	
2. Team members assumed or were assigned needed roles	<input type="checkbox"/>	<input type="checkbox"/>	
3. Team members stayed in role through situation	<input type="checkbox"/>	<input type="checkbox"/>	
4. Adequate help was present	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Medication Administration</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
<input type="checkbox"/> N/A			
1. Medications arrived in a timely manner	<input type="checkbox"/>	<input type="checkbox"/>	
2. Medications were given in accordance with policy	<input type="checkbox"/>	<input type="checkbox"/>	
3. Adequate volume and type of medications were in room	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Device Placement</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
<input type="checkbox"/> N/A			
1. Device was placed correctly	<input type="checkbox"/>	<input type="checkbox"/>	
2. More than one device was used	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Fluid &amp; Blood Product Administration</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Second IV was started in a timely manner	<input type="checkbox"/>	<input type="checkbox"/>	
2. Was any type of blood product administered?	<input type="checkbox"/>	<input type="checkbox"/>	
3. Blood arrived in a timely manner	<input type="checkbox"/>	<input type="checkbox"/>	
4. Was massive transfusion policy activated?	<input type="checkbox"/>	<input type="checkbox"/>	
5. Was rapid transfuser used?	<input type="checkbox"/>	<input type="checkbox"/>	
6. Rapid transfuser arrived in a timely manner	<input type="checkbox"/>	<input type="checkbox"/>	
7. Rapid transfuser was used effectively and according to procedure	<input type="checkbox"/>	<input type="checkbox"/>	
8. Adequate amount of blood was available	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Surgical Treatment</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Operating room ready in timely manner	<input type="checkbox"/>	<input type="checkbox"/>	
2. Adequate staff for procedure	<input type="checkbox"/>	<input type="checkbox"/>	
3. Support staff called to room arrived in time to assist with procedure	<input type="checkbox"/>	<input type="checkbox"/>	
4. Appropriate supplies for procedure were readily available	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Other Issues to Report</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
	<input type="checkbox"/>	<input type="checkbox"/>	

## Obstetric Team Debriefing Form

**Remember: Debriefing is meant to be a learning experience and a way to address both human factors and systems issues to improve the response for next time. There is to be no blaming/finger-pointing.**

Type of event: \_\_\_\_\_ Date of event: \_\_\_\_\_

Location of event: \_\_\_\_\_

Members of team present: (check all that apply)

- |   |  |                                     |   |
|---|--|-------------------------------------|---|
| <input type="checkbox"/> Primary RN           | <input type="checkbox"/> Primary MD            | <input type="checkbox"/> Charge RN  | <input type="checkbox"/> Resident(s)            |
| <input type="checkbox"/> Anesthesia personnel | <input type="checkbox"/> Neonatology personnel | <input type="checkbox"/> MFM leader | <input type="checkbox"/> Patient Safety Officer |
| <input type="checkbox"/> Nurse Manager        | <input type="checkbox"/> OB/Surgical tech      | <input type="checkbox"/> Unit Clerk | <input type="checkbox"/> Other RNs              |

**Thinking about how the obstetric emergency was managed,**

<p><b>Identify what went well:</b> (Check if yes)</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Communication</li> <li><input type="checkbox"/> Role clarity (leader/supporting roles identified and assigned)</li> <li><input type="checkbox"/> Teamwork</li> <li><input type="checkbox"/> Situational awareness</li> <li><input type="checkbox"/> Decision-making</li> <li><input type="checkbox"/> Other: _____</li> </ul>	<p><b>Identify opportunities for improvement:</b> "human factors" (Check if yes)</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Communication</li> <li><input type="checkbox"/> Role clarity (leader/supporting roles identified and assigned)</li> <li><input type="checkbox"/> Teamwork</li> <li><input type="checkbox"/> Situational awareness</li> <li><input type="checkbox"/> Decision-making</li> <li><input type="checkbox"/> Other: _____</li> </ul>	<p><b>Identify opportunities for improvement:</b> "systems issue" (Check if yes)</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Equipment</li> <li><input type="checkbox"/> Medication</li> <li><input type="checkbox"/> Blood product availability</li> <li><input type="checkbox"/> Inadequate support (in unit or other areas of the hospital)</li> <li><input type="checkbox"/> Delays in transporting the patient (within hospital or to another facility)</li> <li><input type="checkbox"/> Other: _____</li> </ul>
---	--	--

**FOR IDENTIFIED ISSUES, FILL IN TABLE BELOW**

ISSUE	ACTIONS TO BE TAKEN	PERSON RESPONSIBLE
	①	
	②	
	③	
	④	

## Severe Obstetric Hemorrhage Review

### Process for Reviewing Severe Maternal Morbidity Event

Source: <http://www.safehealthcareforeverywoman.org/secure/smm-forms.php> (see appendix for example severe maternal morbidity review form)

#### What events should be reviewed?

- Pregnant, peripartal or postpartum women receiving 4 or more units of blood products
- Pregnant, peripartal or postpartum women who are admitted to an ICU as defined by the center.
- Other pregnant, peripartal or postpartum women who have an unexpected and severe medical event – at the discretion of the facility

#### Who should review the event?

Multidisciplinary standing committee at facility representing:

- Obstetrical providers (obstetricians, family physicians and/or advanced practice nurses)
- Anesthesia providers
- Obstetric care nurses
- Facility quality improvement team
- Facility administration
- Patient advocate (should be considered)
- Scribe
- If small center, consider partnering with regional perinatal center or outsourcing the review.

#### When to review?

- As close as possible to the time of the event
- The more severe the event, the closer the timing to review
- If large birthing facility with a number of events, consider scheduling regular meeting to do reviews.

#### How to review?

- Reviews should be sanctioned by the facility and protected from discovery. Confidentiality statements should be gathered from each committee member.
- Gather all past and current patient medical records and facility records regarding this patient and event.
- Engage a trained reviewer/abstractor to complete Part A, the Abstraction Form, including a pertinent synopsis of the event and objective information found in the records.
- Primary review is then presented to the review committee.
- Reviews follow a standard format, such as Part B – The assessment form
- Review concludes with recommendations.

Process & Outcome Measures

The goal of monitoring outcomes and process metrics is to reduce the number of hemorrhages that result in severe maternal morbidity and mortality.

**Process Measures:** Measurement of specific steps that are implemented in order to achieve a desired outcome. Process measures typically document the frequency a new approach is used.

The recommended process measures for the MSPQC/AIM OHI include:

<p><b><u>P1: Unit Drills</u></b></p>	<p><b><u>Report # of Drills and the drill topics</u></b>  <b><u>P1a:</u></b> In this month, how many OB drills (In Situ and/or Sim Lab) were performed on your unit for any maternal safety topic?  <b><u>P1b:</u></b> In this month, what topics were covered in the OB drills?</p>
<p><b><u>P2: Provider Education</u></b></p>	<p><b><u>Report estimate in 10% increments (round up)</u></b>  <b><u>P2a:</u></b> At the end of this month, what cumulative proportion of OB physicians and midwives has completed (within the last 2 years) an education program on Obstetric Hemorrhage?  <b><u>P2b:</u></b> At the end of this month, what cumulative proportion of OB physicians and midwives has completed (within the last 2 years) an education program on the Obstetric Hemorrhage bundle elements and the unit-standard protocol?</p>
<p><b><u>P3: Nursing Education</u></b></p>	<p><b><u>Report estimate in 10% increments (round up)</u></b>  <b><u>P3a:</u></b> At the end of this month, what cumulative proportion of OB nurses has completed (within the last 2 years) an education program on Obstetric Hemorrhage?  <b><u>P3b:</u></b> At the end of this month, what cumulative proportion of OB nurses has completed (within the last 2 years) an education program on the Obstetric Hemorrhage bundle elements and the unit-standard protocol?</p>
<p><b><u>P4: Risk Assessment</u></b></p>	<p><b><u>Report estimate in 10% increments (round up)</u></b>  At the end of this month, what cumulative proportion of mothers had a hemorrhage risk assessment with risk level assigned, performed at least once between admission and birth and shared among the team?</p>
<p><b><u>P5: Quantified Blood Loss</u></b></p>	<p><b><u>Report estimate in 10% increments (round up)</u></b>In this month, what proportion of mothers had measurement of blood loss from birth through the recovery period using quantitative and cumulative techniques?</p>

**Structure Measures:** Measurement of a feature of a healthcare organization related to the capacity to provide high quality health care. Structure measures include measures of the human and material resources available to the healthcare system and organizational factors such as staff deployment and protocols. (Agency for Healthcare Research and Quality)

The recommended structure measures for the MSPQC/AIM OHI include:

<b>S1: Patient, Family &amp; Staff Support</b>	<b>Report Completion Date</b> Has your hospital developed OB specific resources and protocols to support patients, family and staff through major OB complications?
<b>S2: Debriefs</b>	<b>Report Start Date</b> Has your hospital established a system in your hospital to perform regular formal debriefs after cases with major complications?
<b>S3: Multidisciplinary Case Reviews</b>	<b>Report Start Date</b> Has your hospital established a process to perform multidisciplinary systems-level reviews on all cases of severe maternal morbidity (including women admitted to the ICU, receiving $\geq 4$ units RBC transfusions, or diagnosed with a VTE)?
<b>S4: Hemorrhage Cart</b>	<b>Report Completion Date</b> Does your hospital have OB hemorrhage supplies readily available, typically in a cart or mobile box?
<b>S5: Unit Policy and Procedure</b>	<b>Report Completion Date</b> Does your hospital have an OB hemorrhage policy and procedure (reviewed and updated in the last 2-3 years) that provides a unit-standard approach using a stage-based management plan with checklists?
<b>S6: EHR Integration</b>	<b>Report Completion Date</b> Were some of the recommended OB Hemorrhage bundle processes (i.e. order sets, tracking tools) integrated into your hospital's Electronic Health Record system?

**Outcome Measures:** Evaluate the result of specific interventions against the intended goals to determine project success. For the OHI, this includes measurement of key indicators related to severe maternal morbidity resulting from obstetric hemorrhage.

Tracking of outcomes can be accomplished through medical record review, prospective data collection and/or surveillance of ICD.10 codes.

Recommended outcome measures at the facility level may include:

<b>O1: Hemorrhage</b>	Number of women experiencing obstetric hemorrhage this month.
<b>O2: Transfusion</b>	Number of women receiving 4 or more units of blood this month.
<b>O3: ICU Transfer</b>	Number of women experiencing obstetric hemorrhage that are transferred to an intensive care unit.

## APPENDIX/ADDITIONAL RESOURCES

- I. Example Massive Transfusion Protocol
- II. Example Maternal Early Warning Criteria Chart, CMQCC Appendix E. Obstetric Early Warning Chart
- III. Printable Hemorrhage Cart Card
- IV. Printable Visual Estimation Card

## POLICY

**Title: Massive Transfusion Event Protocol Policy: Clinical Manual/General Clinical**

**Home Department: Inpatient Nursing and Transfusion Medicine**

### IMPORTANT NOTICE:

The official version of this document is contained in the Policy and Procedure Manager (PPM) and may have been revised since the document was printed.

#### I. POLICY:

##### Massive Transfusion Event (MTE) Protocol:

The MTE Protocol is initiated at the request of the anesthesiologist, surgeon or physician when rapid infusion of large volumes (> 6 units) of blood/blood components is urgently needed for an acutely bleeding patient.

The use of cryoprecipitate will be based on clinical assessment of the patient and current laboratory values. In an acute setting with ongoing active bleeding, initiation of this protocol assumes patients will receive PRBC's and FFP in an approximate 1:1 ratio.

Nursing will call Transfusion Medicine (TM) and request the initiation of the MTE Protocol and will ensure effective communications. He/she will provide:

- Patient name and MRN
- Verbal orders for any blood products that are needed
- Note: Orders for MTE protocol must be entered into CS-Link as soon as possible.
- STAT blood sample for cross match or confirming ABO (second sample) if required.
- Name and telephone number for the nursing contact person for the event.

##### Provision of Blood / Blood Components:

The patient requiring this protocol is given the highest priority over all other blood orders being concurrently processed.

Transfusion Medicine ensures the immediate availability of all required blood/blood components necessary for optimal patient management.

First MTE cooler will include:

- 6 units of uncross matched group O RBCs,
- 4 units of thawed AB plasma and
- 1 unit of plateletpheresis.

Subsequent MTE coolers will include (unless ordered otherwise by the physician):

- Six (6) units of uncrossmatched group O RBCs,
- Six (6) units of thawed AB plasma or type-specific plasma if specimen available
- One (1) unit of plateletpheresis

**POLICY**

**Title: Massive Transfusion Event Protocol Policy: Clinical Manual/General Clinical**

**Home Department: Inpatient Nursing and Transfusion Medicine**

**IMPORTANT NOTICE:**  
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	6 Units RBC O negative	6 Units RBC O positive	4 Units AB Plasma	1 Platelets	Immediate Availability
Females $\leq$ 50 yrs or whose age is unknown	✓		✓	✓	<ul style="list-style-type: none"> <li>The immediate need for uncross matched blood may be met by using the O positive or O negative blood stored in the "uncross matched blood" refrigerators.</li> <li>The Blood Bank will continue to meet the patient's clinical needs with uncross matched O positive and O negative blood until the event is over or the physician requests cross matched blood.</li> </ul>
All pediatric patients 15 years of age or under	✓		✓	✓	
Men and Postmenopausal Women		✓	✓	✓	

Patients who initially received group O, Rh negative RBCs and subsequently found to be Rh positive on current and confirmatory blood typing, are switched to group O, Rh positive RBCs.

Patients who initially received group O, Rh positive RBCs and subsequently found to be Rh negative on current and confirmatory blood typing, are given Rh positive RBCs for the rest of the event.

The Blood Bank will prepare additional components (plasma, platelets, and cryoprecipitate) as ordered by the physician and maintain 6 RBC and 6 FFP "to be available" at all times until the event is over.

**Communication**

One person from each area/department will be designated to communicate with the Technologist-in-Charge (TIC). This designated person must communicate with the TIC when the next set of blood components will be needed.

The TIC serves as the Transfusion Medicine contact person for **all** communication with the patient care area during this event and will only communicate with the designated patient care area contact person (nurse or physician).

To resolve any patient problems or questions:

- Trauma

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- OR
- L & D
- Blood Bank Hotline

The TIC is responsible for reconciling the transfused/returned blood products with the inventory and coolers at the end of the event and for recording completion and any unexpected findings in the comments section of the MTE Worksheet.

**Terminating the MTE**

The physician in charge is responsible for halting the protocol and communicating this to the nurse in charge who in turn must notify the Blood Bank.

**Return of Unused Blood/Blood Components**

The charge nurse will assume the responsibility for returning all unused units of blood to the Blood Bank within 30 minutes.

**II. PURPOSE:**

To describe a protocol for managing a massive transfusion event, defined as the provision of uncross matched RBCs and blood components for an acutely bleeding patient who requires rapid infusion of large volumes of blood urgently.

**III. PROCEDURE (see also Attachment 1):**

- A. Notify the Blood Bank of the MTE declared by the physician.
- B. Obtain Equipment / Materials

<p><b>Equipment</b></p> <ul style="list-style-type: none"> <li>• Cooler with blue ice packs</li> <li>• Cooler inserts or carriers</li> </ul>
<p><b>Materials</b></p> <ul style="list-style-type: none"> <li>• TS5109 Massive Transfusion Protocol Patient Worksheet</li> <li>• TS5092 Blood Bank - Patient &amp; Product Identification Form (PPI Form)</li> </ul>

## POLICY

**Title: Massive Transfusion Event Protocol Policy: Clinical Manual/General Clinical**

**Home Department: Inpatient Nursing and Transfusion Medicine**

### IMPORTANT NOTICE:

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- C. Obtain/receive blood/blood components immediately from the Blood Bank (see page 1 - **Provision of Blood / Blood Components**):
- The first cooler will include 4 units of group AB plasma regardless of patient blood type.
  - ABO-compatible plasma will be provided if the patient's ABO/Rh type has been determined on a sample collected during the current admission.
  - The Blood Bank will thaw additional group AB plasma as needed until a blood type is determined.
- D. Sign the "Uncross matched Blood Form" that lists all the RBC units in the cooler and return to Blood Bank (see Attachment 2).
- E. Warm fluids and blood via rapid warmer infuser or other appropriate fluid warming device where possible to avoid hypothermia:
1. Place patient on hypothermia mattress on the OR table and use a warming air-low blanket (e.g., "Blair Huggar" as per MD order)
  2. Provide environmental temperature control, e.g., warm room
  3. Warm saline for irrigation
  4. Use fluid warmers for blood and fluid (e.g. Level One or Rapid Infuser)
  5. Provide humidified O<sub>2</sub> for those patients on a ventilator
- F. Continue to use uncross matched group O blood until the event is over or the patient's physician requests cross matched blood.
- Note: Blood Bank will:
- Notify a TM physician when more than 6 units of uncross matched blood are issued for a massive transfusion event.
  - Perform a **STAT** type and screen if not already done, using tube test for ABO/Rh typing and manual gel test for antibody screening.
  - Tube to the unit a copy of the RBC unit tag for placement in the patient's medical record.
  - Keep at least six (6) units each of RBCs and thawed plasma allocated for the patient in the Blood Bank at all times until the bleeding episode is over.

#### IV. RELATED POLICIES AND PROCEDURES

- Blood and Blood Components: Administration (Transfusion) and Management

## POLICY

**Title: Massive Transfusion Event Protocol Policy: Clinical Manual/General Clinical**

**Home Department: Inpatient Nursing and Transfusion Medicine**

### IMPORTANT NOTICE:

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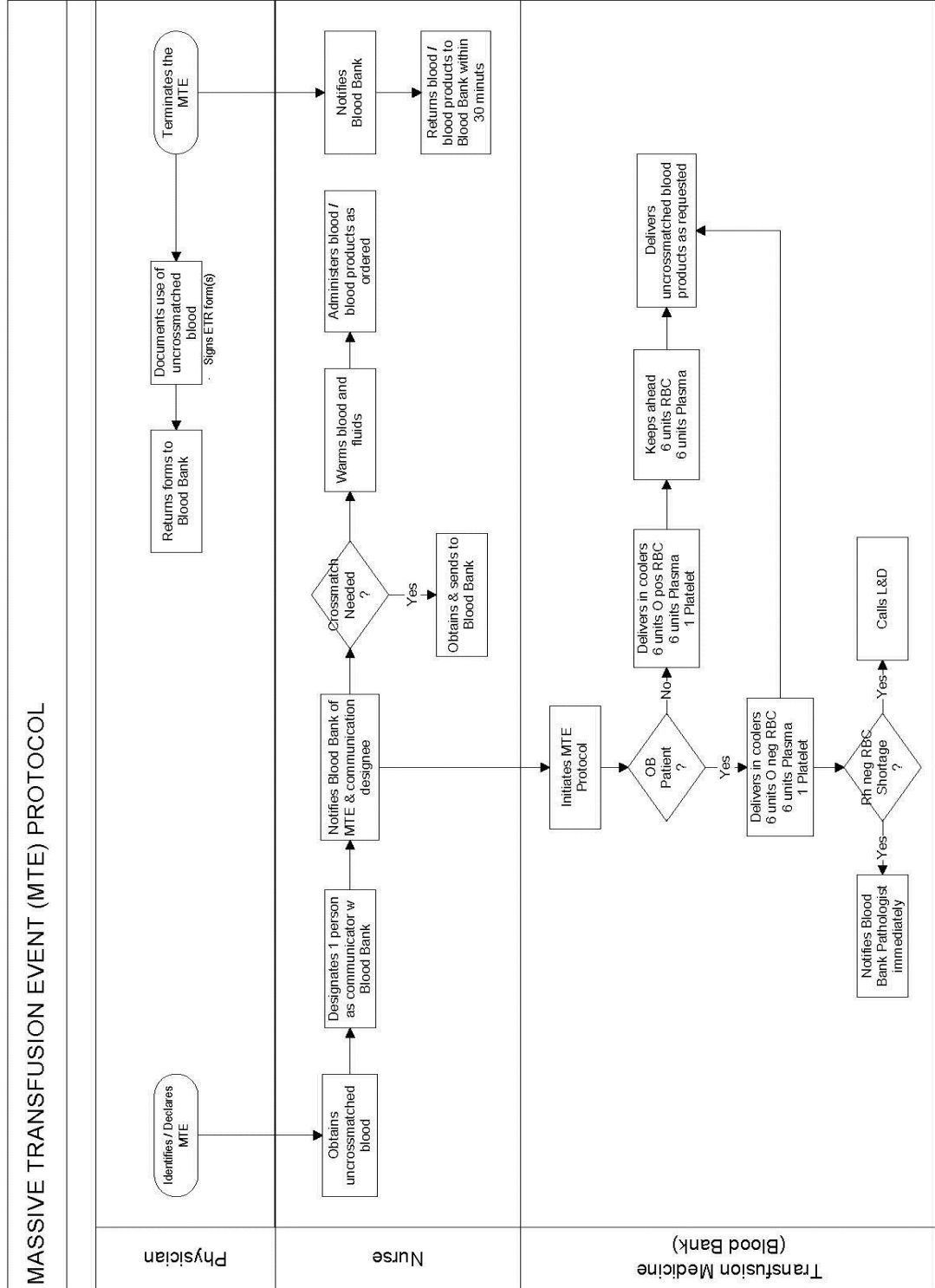
- ABO Grouping (Tube Test)
- Rh (D) Typing and Weak D Testing (Tube Test)
- Antibody Screening by ID-MTS Gel Test

### V. REFERENCES

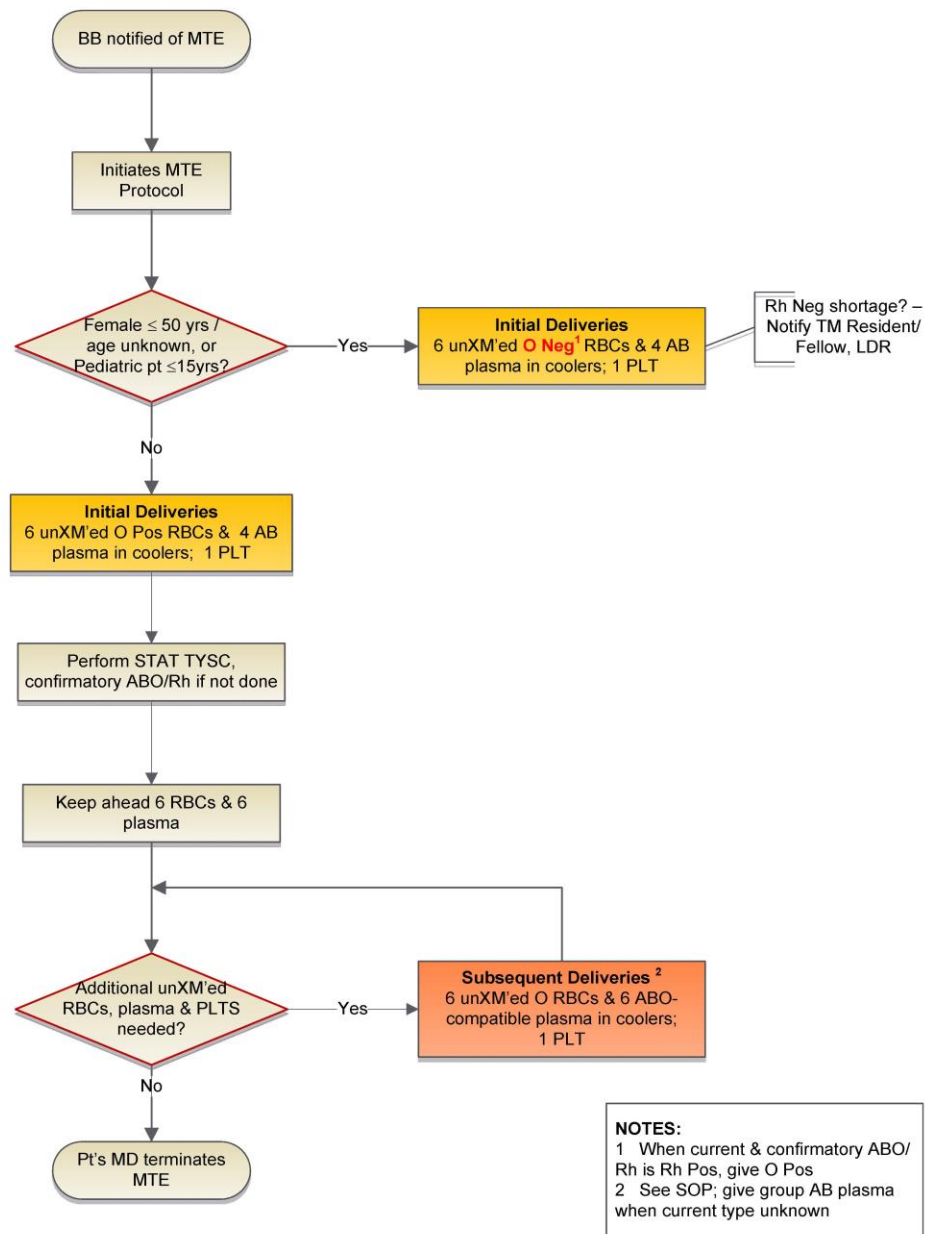
- Technical Manual, 17th Edition, AABB, Bethesda, MD, 2011.
- Standards for Blood Banks and Transfusion Services, 28th Edition, AABB, Bethesda, MD, 2012.

**Original Effective Date:** 5/2010

ATTACHMENT 1



## Massive Transfusion Event (MTE) Protocol




















# OB HEMORRHAGE CART- RECOMMENDED INSTRUMENTS & SUPPLIES

Reference: California Maternal Quality Care Collaborative: Obstetric Hemorrhage Toolkit V 2.0





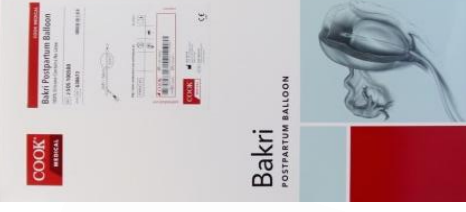
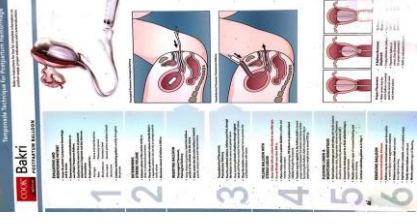

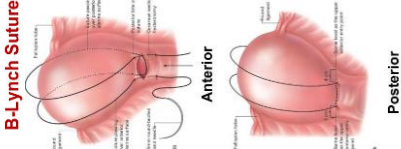
## POST PARTUM FLOOR HEMORRHAGE KIT

**Recommendation**  
Labor and delivery units construct a sterile tray/kit that provides rapid access to instruments and supplies used to treat PPH. All OB staff are trained about contents, location and use of carts.

			
<b>OB hemorrhage algorithm card</b>	<b>Urinary catheter kit with urimeter</b>	<b>1 liter bag lactated Ringers</b>	<b>Hemabate 250 mcg/ml 1 ampule</b>
			
<b>Flashlight</b>	<b>Sterile gloves ( assorted sizes)</b>	<b>IV tubing</b>	<b>Cytotec 200mg tablets 5 tabs</b>
			
<b>Ring Forceps</b>	<b>Vaginal Packs/ Ra dio opaque gauze</b>	<b>Hemabate 250 mcg/ml 1 ampule</b>	<b>Hemabate 250 mcg/ml 1 ampule</b>
			
<b>Sterile speculum</b>	<b>IV start kit, 18 gauge angiocath</b>		
			
<b>Lubricating jelly</b>			

## MEDICATIONS: L&D, OR, POST PARTUM

## HEMORRHAGE CART INSTRUMENTS

							
<b>Weighted Speculum</b>	<b>Ring Forceps</b>	<b>Long Needle Driver</b>	<b>Grasping Forceps</b>	<b>Long right angle vaginal retractors</b>	<b>Banjo Curettes</b> Various sizes	<b>Uterine Balloon</b>	<b>Diagrams Depicting Various Procedures (Balloon placement, B-Lynch)</b>
							
<b>Sutures (For laceration repair and B-Lynch)</b>	<b>Sutures (For laceration repair and B-Lynch)</b>						<b>B-Lynch Suture</b> Anterior Posterior



**Peri pad - 100cc**



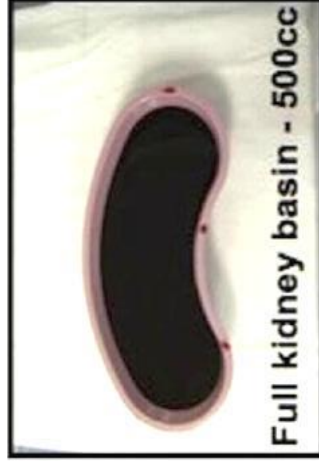
**Peri pad - 300cc**



**Tail sponge - 30cc**



**Bed pad - 250cc**



**Full kidney basin - 500cc**



**1000cc**



**Chux pad - 50cc**



**Chux pad - 200cc**