



Obstetric Hemorrhage Initiative Toolkit

A Collaborative Quality Improvement Initiative with
the Alliance for Innovation in Maternal Health and
the Centers for Disease Control and Prevention



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HOW TO USE THIS TOOLKIT

This toolkit is organized according to the 4-R's of the AIM Obstetric Hemorrhage Patient Safety Bundle: **Readiness, Recognition & Prevention, Response and Reporting/Systems Learning**. For each section, there is an overview of the section, the recommended elements to achieving the components and recommended education. The Oregon Perinatal Collaborative 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 OPC Obstetric Hemorrhage Initiative. We fully encourage providers and hospitals to review and utilize the resources from the following organizations in addition to the OPC, as they each offer valuable tools and guidance for addressing obstetric hemorrhage.

Key references for this toolkit include:

AIM

<https://safehealthcareforeverywoman.org/aim-program/>

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

Obstetric Hemorrhage Toolkit

<https://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

California Maternal Quality Care Collaborative

Lyndon A, Lagrew D, Shields L, Main E, Cape V. Improving Health Care 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

Mississippi Perinatal Quality Collaborative

Obstetric Hemorrhage Initiative Toolkit: A Collaborative Quality Improvement Initiative with the Alliance for Innovation in Maternal Health

<https://mispqc.org/wp-content/uploads/2017/02/MSPQC-Obstetric-Hemorrhage-Toolkit.pdf>

Oregon Perinatal Collaborative

<https://oregonperinatalcollaborative.org/>

Oregon Maternal Data Center

<https://oregonperinatalcollaborative.org/initiative/maternal-data-center/>

Readiness

Readiness in this toolkit includes recommendations for delivery; however, important resources for screening and treating conditions associated with clinically significant blood loss can be found in the [appendix](#). All providers should consider risk factors for hemorrhage and appropriate evaluation and treatment of anemia or risk of excess blood loss prior to delivery. At the time of delivery, preventing delays and preparing for the optimal management of obstetric hemorrhage fall under five domains of recommendations for Readiness:

1. Development of a hemorrhage cart or kit with supplies, checklist and instruction cards for intrauterine balloons and compression stitches.
2. Immediate access to hemorrhage medications (recommended medications and doses included in [appendix](#)).
3. Establishment of a response team – whom to call when help is needed (blood bank, advanced gynecologic surgery, other support and tertiary services).
4. Establishment of massive and emergency release transfusion protocols (type-O negative/uncrossmatched) and establish transfer protocols to a higher level of care if appropriate.
5. Establishment of unit and/or practice education on hemorrhage protocols with multidisciplinary drills and debriefs for all members of the care team.

Each domain has additional detail listed below with examples or templates to aid in implementation.

Recommended Resources:

ACOG Practice Bulletin No. 76: Postpartum Hemorrhage

http://journals.lww.com/greenjournal/Citation/2006/10000/ACOG_Practice_Bulletin_No_76_Postpartum.46.aspx

AIM eModule 2: Obstetric Hemorrhage Readiness

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

CMQCC Improving Health Care Response to Obstetric Hemorrhage

<https://safehealthcareforeverywoman.org/wp-content/uploads/2016/09/Response-2-Improving-Health-Care-Response-to-Obstetric-Hemorrhage-CMQCC.pdf>

Domain 1: Hemorrhage Cart/Kit

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

Hemorrhage Cart/Kit Quality Measure

Does your facility or practice have OB hemorrhage supplies readily available, typically in a cart or mobile box kit? (Reported annually or at project completion date)

Domain 2: Medication Access

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. A sample list of the recommended medications and dosing and an overview of a hemorrhage cart/kit supply list is in the [appendix](#).

Domain 3: 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 should be involved in care decisions, kept informed and included in debriefings and updates. This list should be refined to reflect the capacity of each individual facility, formed with the overarching goal of providing multidisciplinary, comprehensive support to patients and their families.

Suggested Obstetric Hemorrhage Response Team Members:

- Obstetric provider
- Anesthesia provider
- Bedside nurse
- Blood bank
- Point of care blood draws and testing (varies by institutional practice)
- Pharmacist
- ICU team
- General surgeon
- ED physician
- Neonatal team
- Social services/chaplain

Core Activities of Obstetric Hemorrhage Response Team:

- Establishing 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

Contact the Oregon Perinatal Collaborative (opc@ohsu.edu) for additional support or assistance in assembling an obstetric hemorrhage response team.

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

Domain 4: Massive Transfusion Protocols

Timely preparation and appropriate administration of blood products in the face of an obstetric hemorrhage can be critical to the treatment of disseminated intravascular coagulation, and prevention of severe morbidity and maternal death. Examples of massive transfusion protocols can be found in the [appendix](#). Additionally, training should include provider and staff education about hematologic differences in pregnancy and postpartum in order to improve timeliness of resuscitation, product preparation and transfusion, and resource mobilization.

Recommended Resources:

ACOG Massive Transfusion Protocols and Postpartum Hemorrhage:

<https://www.acog.org/About-ACOG/ACOG-Departments/Patient-Safety-and-Quality-Improvement/How-I-Practice/Massive-Transfusion-Protocols-and-Postpartum-Hemorrhage?IsMobileSet=false>

CMQCC Obstetric Hemorrhage Toolkit 2.0 Webinar Recording: Engaging the Blood Bank

<https://www.youtube.com/watch?v=IHx589I9wGA&feature=youtu.be>

CMQCC Blood Product Replacement: OB Hemorrhage

<https://www.cmqcc.org/resource/ob-hem-blood-product-replacement-obstetric-hemorrhage>

Domain 5: Education & Unit-Based Drills

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 two years. Online training, lectures and assigned readings are all potential approaches to standard unit education. A clinical leader 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 two years) an education program on Obstetric Hemorrhage?
2. At the end of this quarter, what cumulative proportion of staff has completed (within the last two years) an education program on the Obstetric Hemorrhage bundle elements and the unit-standard protocol?

Educational Tools

AIM eModules

OPC 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 is addressed in the obstetric hemorrhage eModules. The eModules are available free of cost online at www.safehealthcareforeverywoman.org/aim- emodules as well as within the HealthStream Catalog for subscribing health care facilities.

For the initiative, 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: Postpartum Hemorrhage

<https://www.acog.org/Clinical-Guidance-and-Publications/Practice-Bulletins/Committee-on-Practice-Bulletins-Obstetrics/Postpartum-Hemorrhage>

Existing Slide Sets/Recordings for Professional Education:

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

Available online: <https://www.acog.org/-/media/Districts/District-II/Public/SMI/v2/HEMSlideSetNov2015.pdf?dmc=1&ts=20191022T2105078273>

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>

Example #3: NACPM Webinar – Postpartum Hemorrhage_ Quantifying Blood Loss _ Formulary for Community Settings <https://vimeo.com/362673503>

Simulation & Unit-Based 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 assess preparedness for a clinical emergency, identify strengths and weaknesses in unit policies and procedure, provide hands-on training for staff, and enhance teamwork and communication. Participants in the hemorrhage initiative are encouraged to arrange scheduled and unscheduled drills/simulations that include representatives from each discipline who may play a role in the management of an obstetric hemorrhage.

Simulation & Drills Quality Measures — Provider & Nurses:

Report number of drills and the drill topics.

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

Recommended Resources:

ACOG OB-GYN Simulations Curricula: Postpartum Hemorrhage: Uterine Atony
<https://www.acog.org/About-ACOG/ACOG-Departments/Simulations-Consortium>

AWHONN OB Hemorrhage Webinars: Simulation Based Training Strategies
<http://www.pphproject.org/resources.asp>

CMQCC OB Hemorrhage Toolkit V 2.0
<https://www.cmqcc.org/resources-tool-kits/toolkits/ob-hemorrhage-toolkit>

OB Hemorrhage Simulation Drills, Educational Tools #1 - #4
<https://www.cmqcc.org/resource/ob-hem-simulations-drills>

Wisconsin Association for Perinatal Care: Case Scenario for the Postpartum Hemorrhage Drill
http://www.perinatalweb.org/themes/wapc/assets/docs/participant_drill.pdf

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 of care:
 - Antepartum
 - Admission for labor
 - During labor (including start of second stage and start of fourth stage)
 - Transfer to postpartum care
2. Measurement of cumulative blood loss (quantitative preferred)
3. Active management of third stage of labor

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

Recommendation for Every Unit:

Establish a protocol in your hospital for early identification of increasing risk factors and early warning signs and appropriate escalation of care in your institution

Domain 1: 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 their entire pregnancy, as well as within minutes during labor and postpartum, 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.

With implementation of risk assessment, recognition of action steps for clinical staff to follow also allows for appropriate escalation of care. Successful systemwide implementation of early warning trigger systems has been one way teams have achieved success in responding systematically to risk and early warning signs. Below is information about hemorrhage risk assessments and maternal early warning triggers. Sample risk assessment forms and early warning trigger systems are included in the [appendix](#).

Hemorrhage Risk Assessment Quality Measure

At the end of a quarter, what cumulative proportion of patients had a hemorrhage risk assessment with risk level assigned, performed at least once between admission and birth?

Recommended Resources:

AIM eModule 2: Obstetric Hemorrhage Recognition & Prevention

https://safehealthcareforeverywoman.org/eModules/eModule-2-Recognition/presentation_html5.html

CMQCC OB Hemorrhage Toolkit V 2.0 Risk Factor Assessment

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

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 the requirement 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. Facilities should also incorporate specific triggers for blood loss into their surveillance systems.

Recommended Resources:

AIM eModule 1 Webinar Recording: Maternal Early Warning Systems (MEWS)

<http://www.safehealthcareforeverywoman.org/eModules/eModule-MEWS-1/presentation.html>

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

https://www.researchgate.net/profile/Jeffrey_King5/publication/265419090_The_Maternal_Early_Warning_Criteria_A_Proposal_From_the_National_Partnership_for_Maternal_Safety/links/5b173a79aca272d24cc3c523/The-Maternal-Early-Warning-Criteria-A-Proposal-From-the-National-Partnership-for-Maternal-Safety

Domain 2: Quantification of Blood Loss

Inaccuracy 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.

Two complementary 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 and/or operating room,

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

Quantification of Blood Loss Quality Measure

In this quarter, what proportion of patients 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, Practice Brief Number 1

[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

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

FPQC: Obstetric Hemorrhage Initiative

<https://health.usf.edu/publichealth/chiles/fpqc/OHI>

Lee Memorial Health System's Tips and Tricks on Quantification of Blood Loss After Vaginal Birth video

<https://vimeo.com/107626785>

Domain 3: 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 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 in order to complete other components 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 patients 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 with checklists. Consider including:

- Utilization of assessment tools that trigger or facilitate escalating response within each hemorrhage stage
- Formal response teams
- Communication plan for activation
- Necessary medications/equipment and tools
- Multidisciplinary design
- Debriefs/reviews

2. Support program for patients, family and staff for all significant hemorrhages.

Domain 1: Emergency Plan

Unit-standard stage-based obstetric hemorrhage emergency management plans should be adopted for every unit or practice setting. These plans should be regularly reviewed in simulation and education training and should be easily accessible during episodes of hemorrhage. The [appendix](#) includes examples of sample checklists by stage, lists of recommended medications and equipment, surgical techniques and debrief tools.

Recommended Resources:

AIM eModule 2: Obstetric Hemorrhage - Response

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

AWHONN Postpartum Hemorrhage Project

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

AWHONN Obstetric Patient Safety Classroom Course for Postpartum Hemorrhage

<https://www.awhonn.org/page/OPSGettingStarted>

CMQCC OB Hemorrhage Toolkit V 2.0: Response

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

OPC OB Hemorrhage <https://oregonperinatalcollaborative.org/initiative/ob-hemorrhage/>

Domain 2: Patient, Family & Staff Support

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

Recommendation:

All health care facilities include resources and guidelines for providing support to patients, families and clinical staff in their obstetric emergency plans.

Patient, Family & Staff Support Quality Measure

At the completion of the project period, has your facility 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/About-ACOG/ACOG-Districts/District-II/SMI-Project-Overview>

California Maternal Quality Care Collaborative - Resources for Women, Families, and Clinicians After an Obstetric Emergency

<https://www.cmqcc.org/resource/ob-hem-resources-women-families-and-clinicians-after-obstetric-emergency>

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>

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 systemwide improvements.

Recommendations for Every Unit:

1. Establish a culture of huddles for high-risk patients and post-event debriefs to identify successes and opportunities.
2. Conduct multidisciplinary review of clinically significant hemorrhages for systems issues and to evaluate the effectiveness of the care.
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>

Oregon Maternal Data Center

<https://oregonperinatalcollaborative.org/initiative/maternal-data-center/>

Domain 1: Briefs, Huddles & Debriefs

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. Definitions are adopted from TeamSTEPPS resources with additional information available below.

Obstetric Hemorrhage Debrief Quality Measures

1. At the project completion: Has your facility established a system 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.

Pre-Event Huddles are discussions called prior to a case or delivery with risk for hemorrhage.

The aim is to:

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

Intra-Event Huddles are brief ad-hoc discussions that aim to:

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

Post-Event Debriefs are feedback sessions that occur shortly after events and include the involved care team. Debriefs aim to:

1. Identify opportunities to improve teamwork, skills and outcomes
2. Include an opportunity to recount and document key events
3. Establish a method to formally change the existing plan or resources for future events

Recommended Resources:

Team STEPPS: Team Strategies & Tools to Enhance Performance & Patient Safety:

<https://www.ahrq.gov/teamstepps/index.html>

CMQCC Obstetric Hemorrhage Appendix C: Debriefing Tool

<https://www.cmqcc.org/resource/ob-hem-appendix-c-debriefing-tool>

ACOG District II Safe Motherhood Initiative: Obstetric Debriefing Form

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

Domain 2: Severe Obstetric Hemorrhage Review

Which events should be reviewed?

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

Who should review the event?

Multidisciplinary standing committee at facility; consider including:

1. Obstetrical providers (obstetricians, midwives, family physicians and/or advanced practice nurses)
2. Anesthesia providers
3. Obstetric care nurses
4. Facility quality improvement team
5. Facility administration
6. Patient advocate
7. If small center, consider partnering with regional perinatal center or outsourcing the review

When to review?

1. As close as possible to the time of the event
2. If large birthing facility with multiple events, consider scheduling regular meeting to do reviews

How to review?

1. Reviews should be sanctioned by the facility and protected from discovery. Confidentiality statements should be gathered from each committee member.
2. Gather all past and current patient medical records and facility records regarding patient and event.
3. Consider using the AIM Severe Maternal Morbidity Reporting Form (link below). Clinical personnel uninvolved in the case should complete Part A, the Abstraction Form, including a pertinent synopsis of the event and objective information found in the records.
4. Primary review is then presented to the review committee.
5. Reviews follow a standard format, such as Part B – the assessment form.
6. Review concludes with recommendations.

Recommended Resources:

AIM Severe Maternal Morbidity Reporting Form

https://safehealthcareforeverywoman.org/patient-safety-tools/severe-maternal-morbidity-review/#link_acc-1-5-d

Domain 3: Process, Structure & 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 process measures for the OPC/AIM Obstetric Hemorrhage Initiative include:

P1: Unit Drills	<p>Report # of Drills and the drill topics</p> <p>P1a: In this quarter, how many OB drills (In Situ and/or Sim Lab) were performed on your unit for any maternal safety topic?</p> <p>P1b: In this quarter, what topics were covered in the OB drills?</p>
P2: Provider Education	<p>Report estimate in 10% increments (round up)</p> <p>P2a: At the end of this quarter, what cumulative proportion of OB physicians and midwives have completed (within the last two years) an education program on Obstetric Hemorrhage?</p> <p>P2b: At the end of this quarter, what cumulative proportion of OB physicians and midwives have completed (within the last two years) an education program on the Obstetric Hemorrhage bundle elements and the unit-standard protocol?</p>
P3: Nursing Education	<p>Report estimate in 10% increments (round up)</p> <p>P3a: At the end of this quarter, what cumulative proportion of OB nurses have completed (within the last 2 years) an education program on Obstetric Hemorrhage?</p> <p>P3b: At the end of this quarter, 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>
P4: Risk Assessment	<p>Report estimate in 10% increments (round up)</p> <p>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>
P5: Quantified Blood Loss	<p>Report estimate in 10% increments (round up)</p> <p>At the end of 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 health care organization related to the capacity to provide high-quality health care. Structure measures, as defined by the Agency for Healthcare Research and Quality, include measures of the human and material resources available to the health care system and organizational factors such as staff deployment and protocols.

The structure measures for the OB Hemorrhage Initiative include:

Readiness	
S1: Hemorrhage Cart/Kit*	<p>Hemorrhage cart/kit with supplies, checklist and instruction cards for intrauterine balloons and compression stitches.</p> <p>WHY: Response to obstetric hemorrhage often requires multiple tools and supplies that can be stored in multiple different places on a unit, leading to delays in care.</p>
S2: Hemorrhage Medications	<p>Immediate access to hemorrhage medications (kit or equivalent).</p> <p>WHY: Minutes can make a difference with medications for uterine atony and there can be multiple structural barriers to achieving rapid access.</p>
S3: Hemorrhage Response Team	<p>Establish a Hemorrhage Response Team—whom to call when help is needed (Anesthesia, Blood Bank, Advanced GYN Surgery and other support and tertiary services).</p> <p>WHY: Severe hemorrhage requires teamwork from many specialties, often in the middle of the night when there is difficulty finding the right people.</p>
S4: Massive Transfusion	<p>Establish massive transfusion protocol.</p> <p>WHY: Delay in availability of multiple units has been a recurrent finding in cases of maternal death and severe morbidity.</p>
S5: Emergency Release Transfusion	<p>Establish emergency release transfusion protocol (including O-negative and uncross-matched red cells).</p> <p>WHY: Delay in blood administration has been a recurrent finding in cases of maternal death and severe morbidity.</p>
S6: Blood Product Refusal	<p>Establish antenatal and intrapartum “processes” (protocols or guidelines) for patients who refuse blood products.</p> <p>WHY: In California, 25% of hemorrhage deaths in California were to Jehovah’s Witnesses and none had a delivery plan. In anticipation of serving Oregon’s population of patients who have an objection to receiving blood products, processes should be established to avoid similar adverse outcomes.</p>
S7: Ongoing Education	<p>Implement ongoing provider (nurses, physicians and midwives) education programs for the above protocols and plans and ascertain that ≥90% (by best estimate) of your medical and nursing staff have received that education.</p> <p>WHY: There are large numbers of nurse, physicians and others on every L&D and post-partum unit that need to fully understand the protocols, and ongoing education to account for turnover is necessary.</p>
S8: Unit Drills	<p>Perform regular unit-based drills for obstetric emergencies, including hemorrhage, with post-drill debriefs</p> <p>WHY: Unit-based drills best identify potential systems issues and provide educational opportunities.</p>

Recognition and Prevention	
S9: Routine Assessment	<p>Establish a practice of routine assessment of hemorrhage risk (prenatal, admission and other appropriate times).</p> <p>WHY: Identification of risk factors leads to anticipatory planning and more rapid response.</p>
S10: Cumulative Blood Loss	<p>Establish a practice of routine measurement of cumulative blood loss for all births (as formal and as quantitative as possible-- while techniques can be individualized for each facility, quantified blood loss measurement (QBL) is becoming the preferred approach).</p> <p>WHY: An objective assessment of blood loss is a critical communication step in moving the team along the hemorrhage management plan.</p>
S11: Third Stage of Labor	<p>Establish active management of third stage of labor (oxytocin at birth) as the expected approach for all women at birth.</p> <p>WHY: Routine oxytocin after birth has been recognized by WHO, ACOG, AWHONN and Cochrane Reviews as the single most important step in reducing obstetric hemorrhage.</p>
Response	
S12. Unit Policy and Procedure*	<p>Establish use of unit-standard, stage-based obstetric hemorrhage Emergency Management Plan with checklists.</p> <p>WHY: Optimal response to obstetric emergencies such as hemorrhage requires a standard plan that staff can be trained to.</p>
S13: Patient, Family, and Staff Support*	<p>Establish supports for patients, families and staff for all major obstetrical complications, including hemorrhages.</p> <p>WHY: A major hemorrhage can be traumatizing for women, their family and even for staff. PTSD is not uncommon.</p>
Reporting and Systems Learning	
S14: Huddles	<p>Establish a culture of Huddles to plan for high-risk patients.</p> <p>WHY: Anticipatory communications and planning is key for rapid and effective response.</p>
S15: Debriefs*	<p>Establish routine post-event debriefing to assess what went well and what could have been improved.</p> <p>WHY: Every emergency case provides lessons as to what went well and what needed systems improvement.</p>
S16: Multidisciplinary Case Reviews*	<p>Establish multidisciplinary reviews of serious hemorrhages for system issues.</p> <p>WHY: Formal reviews as called for by The Joint Commission are an effective tool for driving systems improvement. Each facility should establish its own criteria for the which hemorrhage cases will be reviewed.</p>
S17: Perinatal QI Committee	<p>Establish system to monitor outcomes and process metrics in Perinatal QI committee.</p> <p>WHY: A standing multidisciplinary quality committee has been recognized as key for improving maternity safety and quality.</p>
S18: EHR Integration*	<p>Integrate recommended OB Hemorrhage bundle processes into your hospital's electronic health record.</p> <p>WHY: Integration of processes allows for consistency of implementation across your facility.</p>

*Denotes measures which are mandatory to report

Outcome Measures:

Evaluate the result of specific interventions against the intended goals to determine project success. For the OB Hemorrhage Initiative, 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. For hospitals participating in the OPC OB Hemorrhage Initiative, data will be collected and monitored through the Oregon Maternal Data Center and Hospital Discharge Data in collaboration with Comagine Health.

Outcome measures at the facility level may include:

O1: Severe Maternal Morbidity	Number of women experiencing a Severe Maternal Morbidity (21 conditions, including: Acute Myocardial Infarction, Pulmonary Edema, and Sepsis)
O2: Severe Maternal Morbidity (excluding transfusions)	Number of women experiencing a Severe Maternal Morbidity, excluding those with only a transfusion.
O3: Severe Maternal Morbidity among Hemorrhage Cases	Rate of severe morbidities among delivering women with hemorrhage.
O4: Severe Maternal Morbidity (excluding transfusions) among Hemorrhage Cases	Severe maternal morbidity, excluding cases with transfusion only, among delivering women with hemorrhage.

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Readiness Appendix

Domain 1: Hemorrhage Carts and Kits

Readiness and preparation for postpartum hemorrhage events are essential for expedient patient care. This begins with identification and storage of medications, tools and surgical guides in a single location such as hemorrhage carts and kits. Below are a written and visual example of medications, supplies, and directions to include in hemorrhage carts or kits.

I. OB Hemorrhage Carts and Kits Checklist:

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
- Tranexamic acid 1 g in 10 mL (100 mg/mL) IV

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

II. Tools for OB Carts and Kits



OB HEMORRHAGE CARTS, KITS- RECOMMENDED INSTRUMENTS & SUPPLIES



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

POST PARTUM FLOOR HEMORRHAGE KIT

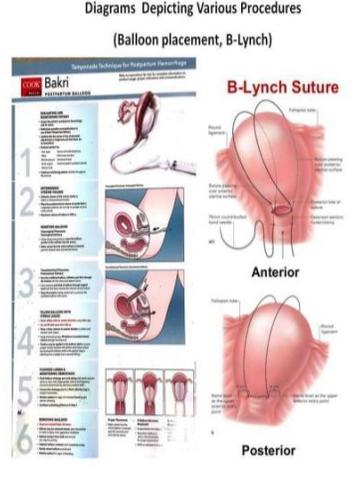
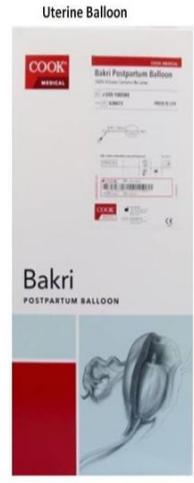
Recommendation
Labor and delivery units construct a sterile tray/kit that provides rapid access to instruments and supplies used to treat PPH. All OB staff are trained about contents, location and use of carts.



MEDICATIONS: L&D, OR ,POST PARTUM



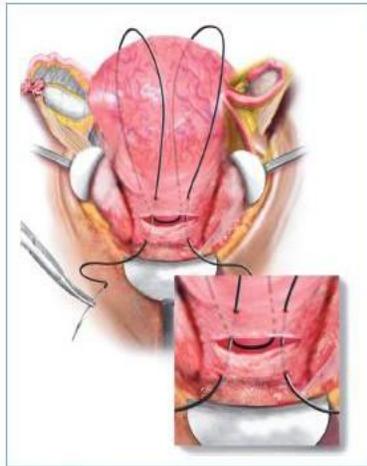
HEMORRHAGE CART INSTRUMENTS



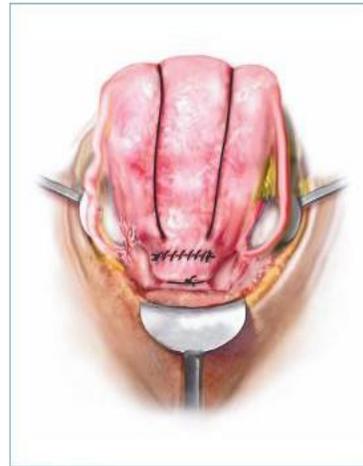
III. External Compression Stitches

EXAMPLE

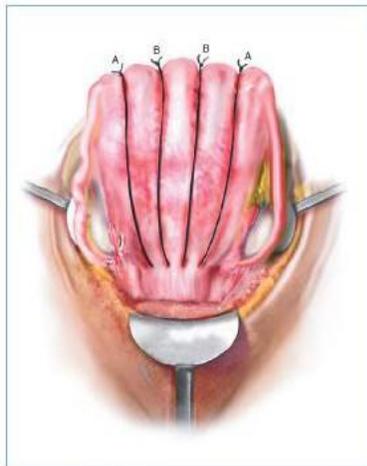
OBSTETRIC HEMORRHAGE Surgical Management



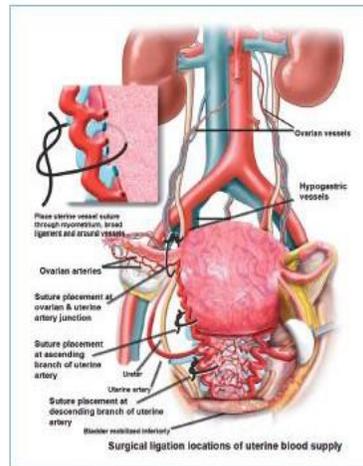
B-Lynch suture



B-Lynch suture



Hayman uterine compression suture

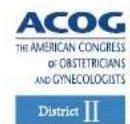


Surgical ligation locations of uterine blood supply

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Management of Acute Obstetric Emergencies, Baha Sibai, MD (Copyright © 2011 by Saunders)

REVISED OCTOBER 2015

Safe Motherhood Initiative



IV. Internal Uterine Balloon Placement

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
 - Railor
 - 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

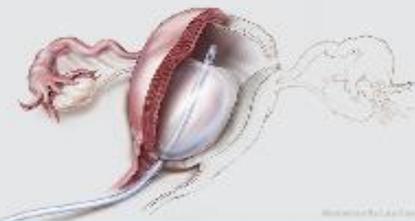
- Maximum indwelling time: 24 hours.
- The timing of balloon removal should be determined by the attending clinician upon evaluation of the patient once bleeding has been controlled and the patient is stable.

- 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.



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Bakri®
POSTPARTUM BALLOON WITH RAPID INSTILLATION COMPONENTS

Illustrations for Inserting the Bakri Balloon (Step 3)

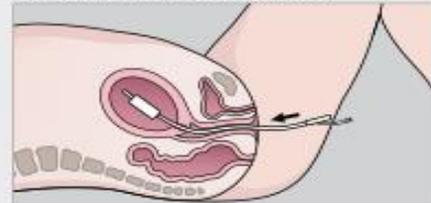


Fig. 1. Transvaginal Placement, Postvaginal Delivery

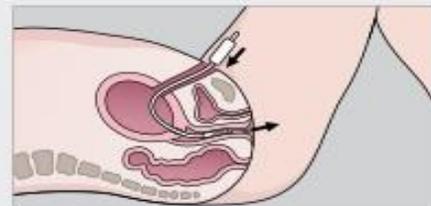
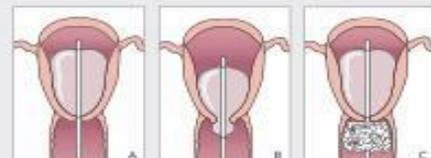


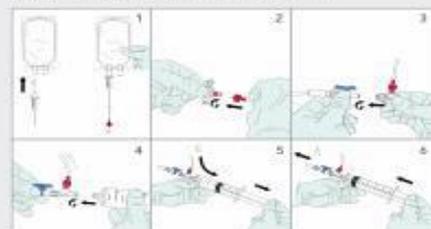
Fig. 2. Transabdominal Placement, Postcesarean Delivery

Explanation of Proper Placement



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

Steps for the Use of Rapid Instillation Components



OR Instrument Table 1



OR Instrument Table 2



Domain 2: Medication access for postpartum hemorrhage.

The common postpartum hemorrhage medications, doses, side effects and contraindications are included below. These are the first line of treatment in the setting of postpartum hemorrhage.

I. Uterotonic Agents for Postpartum Hemorrhage

Uterotonic Agents for Postpartum Hemorrhage						
Drug	Dose	Route	Frequency	Side Effects	Contraindications	Storage
Pitocin® (Oxytocin) 10 units/ml	10-40 units per 500-1000 ml, rate titrated to uterine tone	IV infusion	Continuous	Usually none Nausea, vomiting, hyponatremia (“water intoxication”) with prolonged IV admin. ⚠BP and ⚠HR with high doses, esp IV push	Hypersensitivity to drug	Room temp
Methergine® (Methylergonivine) 0.2 mg/ml	0.2 mg	IM (<u>not</u> 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	Hypertension, Preeclampsia, Cardiovascular disease, Hypersensitivity to drug Caution if multiple doses of ephedrine have been used, may exaggerate hypertensive response w/ possible cerebral hemorrhage	Refrigerate Protect from light
Hemabate® (15-methyl PG F2a) 250 mcg/ml	250 mcg	IM (<u>not</u> given IV)	-Q 15-90 min -Not to exceed 8 doses/24 hrs -If no response after several doses, it is unlikely that additional doses will be of benefit	Nausea, vomiting, Diarrhea Fever (transient), Headache Chills, shivering Hypertension Bronchospasm	Caution in women with hepatic disease, asthma, hypertension, active cardiac or pulmonary disease Hypersensitivity to drug	Refrigerate
Cytotec® (Misoprostol) 100 or 200 mcg tablets	600-800 mcg	Rectal, sublingual or oral	One time	Nausea, vomiting, diarrhea Shivering, Fever (transient) Headache	Rare Known allergy to prostaglandin Hypersensitivity to drug	Room temp
Tranexamic acid (TXA) 100mg/mL	1 gm over 10 min	IV infusion or IV injection	Second dose may be administered after 30 min	Hypotension	Active intravascular clotting, subarachnoid hemorrhage, acquired defective color vision, Hypersensitivity to drug. Caution in women with renal failure	Room temp Mixed at time of use, discard if not used

Readiness for postpartum hemorrhage events also includes staff awareness and preparation for immediate response. Simulation drills are a key component to facilitate patient care in the setting of postpartum hemorrhage. Below are some examples that can be utilized for simulation training.

I. Sample Case Scenario: Source 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 SCENARIO 3
PAGE 1

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?

LEARNER PREPARATION

Pre-session activity

- Review hemorrhage protocol
- Review CMQCC Toolkit:
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

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

EVENTS / PROPOSED CORRECT TREATMENT

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

**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

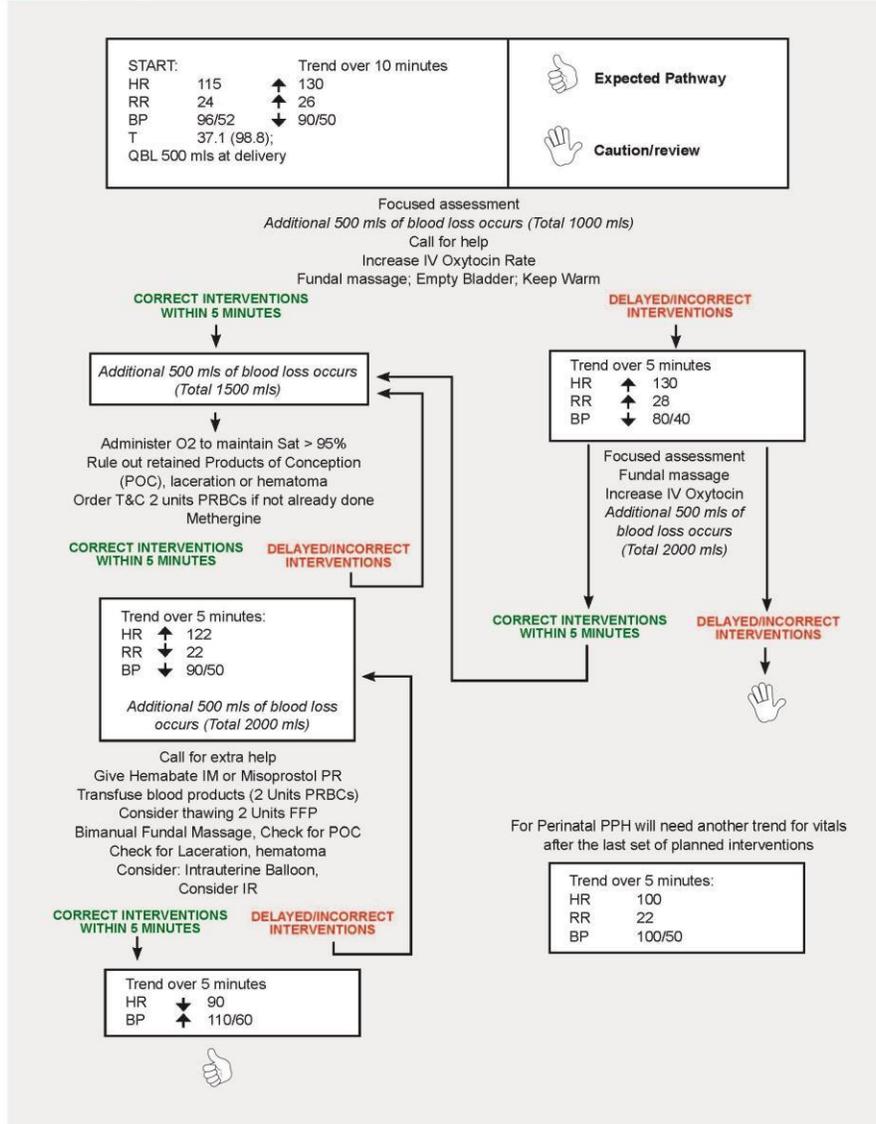
- ___ Tone: Tamponade Device or B-Lynch if Atony
- ___ Tissue: D & C if Retained Products
- ___ Trauma: Repair of Laceration if Trauma
- ___ Thrombin: Massive Transfusion
(Recommend Factor VIIa) if DIC
- ___ Transfusion Begins: Ratio 4-6 PRBCs: 4 FFP: 1 PLTS

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 Simulation Scenarios

ALGORITHM



Source: Kaiser Permanente Perinatal Patient Safety Project

Recognition & Prevention Appendix

Domain 1: Hemorrhage Risk Assessment Tools.

Pregnant patients can lose up to 40% of their blood volume before showing signs of hemodynamic instability. Thus, it becomes important to identify patients at risk for hemorrhage during the antenatal, intrapartum and postpartum period. Below are examples of screening tools that can be used during pregnancy and delivery to assess a patient’s risk for postpartum hemorrhage.

I. CMQCC Hemorrhage Risk Factor Table



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

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

EXAMPLE

OBSTETRIC HEMORRHAGE Risk Assessment Tables

PRENATAL

RISK FACTORS

- Suspected previa/accreta/increta/percreta
- Pre-pregnancy BMI > 50
- Clinically significant bleeding disorder
- Other significant medical/surgical risk
(consider patients who decline transfusion)¹

INTERVENTION

- Transfer to appropriate level of care for delivery²

ANTEPARTUM

RISK FACTORS

- | | TIMING OF DELIVERY (WEEKS) |
|---|----------------------------|
| <input type="checkbox"/> Placenta accreta | 34 0/7 – 35 6/7 |
| <input type="checkbox"/> Placenta previa | 36 0/7 – 37 6/7 |
| <input type="checkbox"/> Prior classical cesarean | 36 0/7 – 37 6/7 |
| <input type="checkbox"/> Prior myomectomy | 37 0/7 – 38 6/7 |
| <input type="checkbox"/> Prior myomectomy, if extensive | 36-37 |

PLACENTA ACCRETA MANAGEMENT³

- For 1 or more prior cesareans, placental location should be documented prior to delivery. Patients at **high risk** for placenta accreta, should:
- Obtain proper imaging to evaluate risk prior to delivery
 - Be transferred to appropriate level of care for delivery if accreta is suspected

¹ See supplemental guidance document on patients who decline blood products

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

³ See supplemental guidance document on morbidly adherent placenta

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OBSTETRIC HEMORRHAGE

Risk Assessment Tables

LABOR & DELIVERY ADMISSION		
	MEDIUM RISK	HIGH RISK
RISK FACTORS	<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	/
INTERVENTION	<input type="checkbox"/> Type & SCREEN, review protocol	<input type="checkbox"/> Type & CROSS, review protocol

INTRAPARTUM		
	MEDIUM RISK	HIGH RISK
RISK FACTORS	<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	/
INTERVENTION	<input type="checkbox"/> Type & SCREEN, review protocol	<input type="checkbox"/> Type & CROSS, review protocol

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

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III. The National Partnership for Maternal Safety: Maternal Early Warning Criteria

Systolic BP (mmHg)	<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	
<p>BP, blood pressure</p> <p>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.</p>	

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

Source: CMQCC: Obstetric Hemorrhage Toolkit V 2.0: Recognition: Definition, Early Recognition and Rapid Response Using Triggers

<https://www.cmqcc.org/resource/ob-hem-definition-early-recognition-and-rapid-response-using-triggers>

Domain 2: Quantification of Blood Loss Charts and Learning Aids.

Blood loss at delivery may often be underestimated, leading to delayed hemorrhage response. Tools to develop the ability to quantify blood loss and assist providers in recognizing excessive bleeding are included below.

I. Blood Loss Visual Aid

Simulation tools can be created to aid providers in estimation of blood loss. Simulated blood may be created by using powdered blood purchased through various vendors or may be created by the following recipes.

a. Imitation Blood Recipe #1

- i. 1 cup Karo Syrup
- ii. 1 tablespoon water
- iii. 2 tablespoons red food coloring
- iv. 1 teaspoon yellow food coloring

b. Imitation Blood Recipe #2

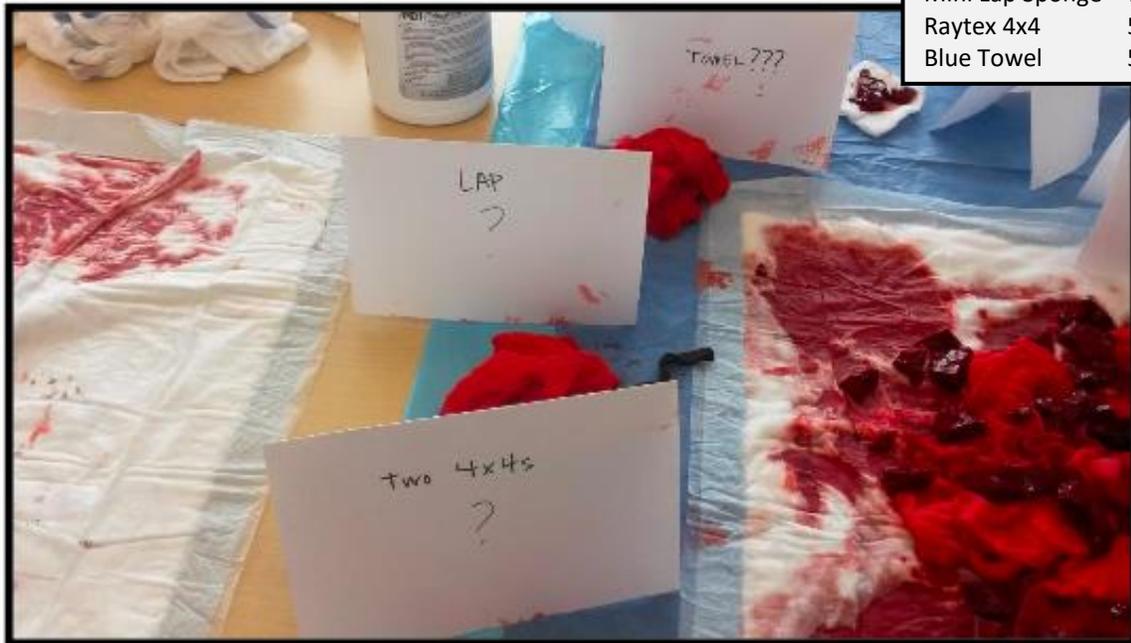
- i. 2 cups corn syrup
- ii. 1 cup water
- iii. 10 tablespoons maize flour
- iv. 10 teaspoons red food coloring
- v. 10 drops blue food coloring

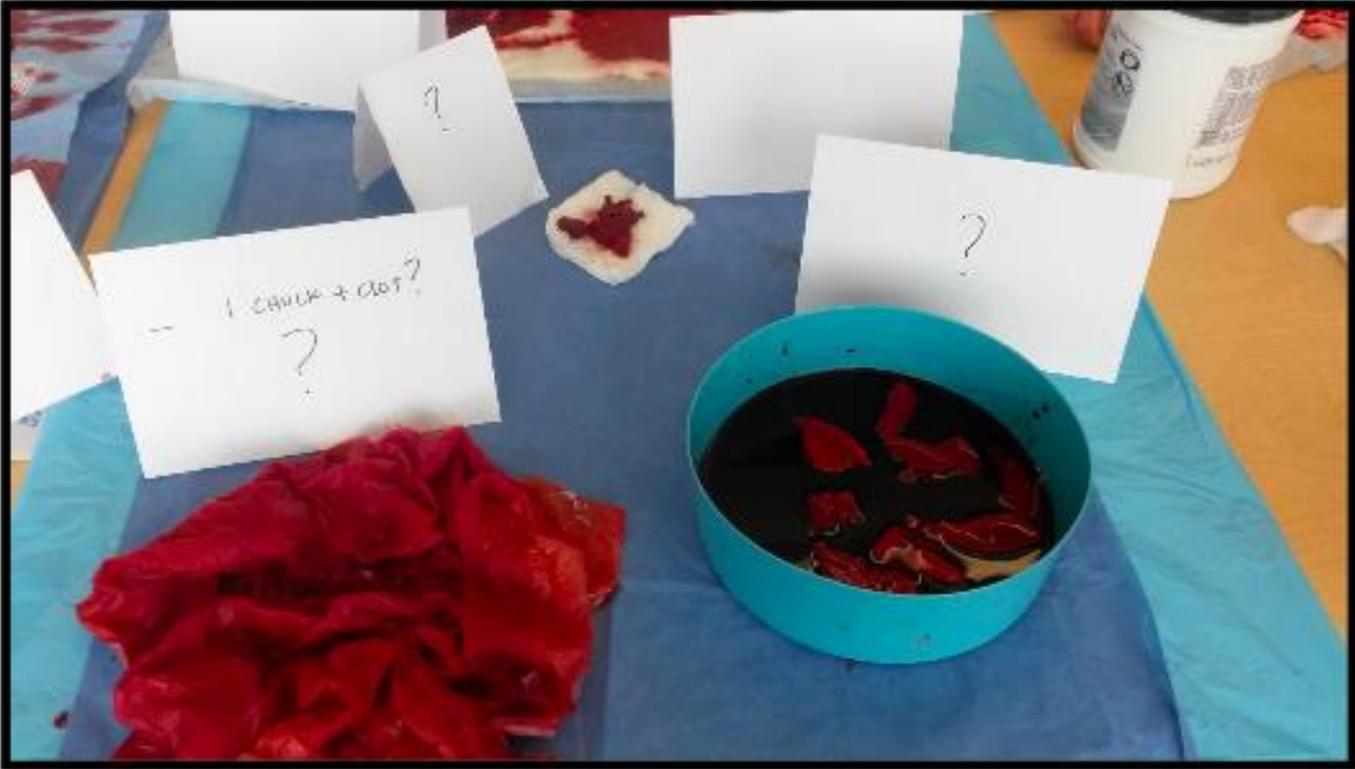
Postpartum Hemorrhage Quantification of Blood Loss

Blood & Clot Estimation Pictures



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







- II. Quantification of Blood Loss (QBL) is an objective method used to evaluate excessive bleeding.
- a. AWONN recommendations for steps to obtain QBL at time of vaginal delivery:
 - i. Create list of dry weights for delivery items that may become blood-soaked.
 - ii. Begin QBL immediately after infant's birth (prior to delivery of placenta) by assessing and recording amount of fluid collected in calibrated under-buttocks drape – this fluid is considered to be amniotic fluid and urine or irrigation.
 - iii. Record total volume of fluid collected in under-buttocks drape following delivery of placenta and vaginal repair.
 - iv. Subtract pre-placenta fluid volume from total fluid volume. Fluid collected after delivery of infant is largely considered to be blood.
 - v. Weigh blood-soaked delivery items and clots.
 - vi. Subtract dry weight of delivery items from overall weight of blood-soaked delivery items and clots. Every 1 gram over dry weight is equivalent to 1mL of blood loss.
 - vii. Add the blood volume collected by the under-buttock drape (step iv) to the blood volume of delivery items (step vi).
 - b. AWONN recommendations for steps to obtain QBL at time of cesarean delivery:
 - i. Begin the process of QBL when the amniotic membranes are ruptured or after the infant is born.
 - ii. Suction and measure all amniotic fluid within the suction canister of collected fluid before delivery of the placenta.
 - iii. After delivery of the placenta, measure amount of blood lost in the suction canister and drapes.
 - iv. Prior to irrigating, ensure that the surgical team communications with anesthesia that irrigation is beginning to allow for measurement of irrigation fluid in the suction canister.
 - v. Weigh all blood-soaked delivery materials and clots. Please note that lap pads that have been dampened with normal saline contain minimal fluid, and their dry weight should be considered equivalent to that of a dry lap pad.
 - vi. Subtract dry weight of delivery items from overall weight of blood-soaked delivery items and clots. Every 1 gram over dry weight is equivalent to 1mL of blood loss.
 - vii. At the conclusion of surgery, add the volume of quantified blood calculated by weight with the volume of quantified blood in the suction canister to determine total QBL.
 - c. AWWONN suggested equipment for QBL:
 - i. Calibrated under-buttocks drapes.
 - ii. Dry weight card, laminated and attached to all scales, for measurement of items that may become blood-soaked when a woman is in labor or after giving birth.
 - iii. Scales to eight blood-soaked items placed on every labor floor, operating room and postpartum unit.
 - iv. Formulas inserted in the electronic charting system that automatically deduct dry weights from wet weights of standard supplies such as chux and peri-pads.

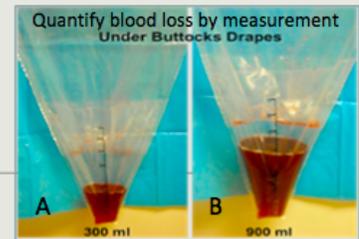
- d. Dry weights of common items:

Item	Dry Weight (g)
10 - 4x4s	25
Blue Towel	60
Lap Sponge	20
Plastic Lap Holder	20
Peri-pad	10
Blue Chux	50
Cloth Chux	530
Mesh Underwear	10
Bed Sheet	530
Gown	420

- e. QBL Tips and Tricks:

Technique for Assessing QBL

- Vaginal Delivery
 - Discuss with provider BEFORE delivery that QBL will be calculated
 - Immediately after birth, assess and record amount of fluid collected in the under-buttocks drape before delivery of placenta (diagram A).
 - After completion of delivery/repair, record total volume of fluid collected in the under-buttocks drape (diagram B).
 - Subtract the pre-placenta fluid volume (A) from the post placenta fluid volume (B).
 - Weigh all blood-soaked materials and clots via scale (1 gram weight=1 mL blood loss volume)-Diagram C
 - When calculating blood loss of the blood soaked item: Wet Item Gram Weight-Dry Item Gram Weight (found on scale)=mL of blood within Item.
 - Add the volume determined in the drape and volume quantified by weight to determine delivery QBL.



Techniques for Assessing QBL

Cesarean Delivery

- In Time out, remind team QBL is being calculated
- After birth of baby, suction all amniotic fluid and assess amount of fluid in canister before delivery of the placenta. Record this Volume on whiteboard.
- To determine quantitative blood loss in the canister, take total volume in the canister and subtract the pre-placental volume.
- Weigh all blood-soaked items (laps, chux, draw sheets, etc.) minus dry weights.
- *Prior to Pulse Lavage or Irrigation-Switch to Canister #2



NOTE: Perinatology Quantification of Blood Loss (QBL) Calculator is an online calculator that can be used to calculate QBL at time of delivery. Weights of common items used at time of delivery are preloaded into this calculator. Link below:

<http://perinatology.com/calculators/Blood%20%20Loss%20Calculator.htm>

Response Appendix

Domain 1: Example of Obstetric Emergency Management Plans

There are known stages of hemorrhage (Stages 0–3), and each stage is correlated with specific assessments, treatment methods and response. Below are tables and tools that can be used as reminders of the correct response to Stage 0–3 hemorrhages.

- Stage 0 – Every patient in labor or giving birth
- Stage 1 – Blood loss >500mL at time of vaginal delivery or >1000mL at time of cesarean delivery with continued bleeding and stable vital signs and lab values OR vital sign changes (HR>110, BP <85/45, O2 sat <95%)
- Stage 2 – Continued bleeding and QBL less than 1500mL OR >2 uterotonics given with or without stable vital signs
- Stage 3 – Blood loss >1500mL and continued bleeding OR abnormal vital signs/oliguria OR suspicion of disseminated intravascular coagulation

Additionally, examples of massive transfusion protocols are included below. The first example represents the ideal ratio of blood products to transfuse in a patient experiencing significant postpartum hemorrhage, and the second includes laboratory recommendations and the people required to coordinate and support a massive transfusion protocol.

I. CMQCC OB Hemorrhage Emergency Management Table



Obstetric Hemorrhage Emergency Management Plan: Table Chart Format

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

Copyright California Department of Public Health, 2014; supported by Title V funds. Developed in partnership with California Maternal Quality Care Collaborative Hemorrhage Taskforce Visit:

EXAMPLE

Obstetric Hemorrhage Checklist

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 PGF₂α (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:

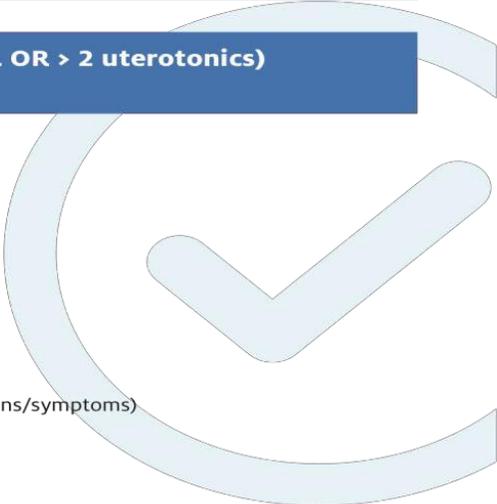
Continue Stage 1 medications

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 PGF₂α (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

III. ACOG Massive Transfusion Protocol

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>1 Patient currently bleeding & at risk for uncontrollable bleeding</p> <p>A Activate MTP - call (ADD NUMBER) & say "activate massive transfusion protocol"</p> <p>B Nursing/anesthesia draw stat labs</p> <ul style="list-style-type: none">- type & crossmatch- hemoglobin & platelet count, PT (INR)/PTT, fibrinogen, & ABG (as needed) <p>➔</p>	<p>2 Immediate need for transfusion (type & crossmatch not yet available)</p> <p>A Give 2-4 units O-negative PRBCs</p> <p>B "OB EMERGENCY RELEASE"</p> <p>➔</p>
<p>3 Anticipate ongoing massive blood needs</p> <p>A Obtain massive transfusion pack</p> <ul style="list-style-type: none">- Consider using coolers <p>B Administer as needed in a 6:4:1 ratio</p> <ul style="list-style-type: none">- 6 units PRBCs- 4 units FFP- 1 apheresis pack of platelets <p>➔</p>	<p>4 Initial lab results</p> <p>A Normal > anticipate ongoing bleeding > repeat massive transfusion pack > bleeding controlled > deactivate MTP</p> <p>B Abnormal > repeat massive transfusion pack > repeat labs > 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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IV. CMQCC Massive Transfusion Protocol

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

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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"> 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. 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.
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

POLICY

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

Home Department: Inpatient Nursing and Transfusion Medicine

IMPORTANT NOTICE:

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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

Equipment

- Cooler with blue ice packs
- Cooler inserts or carriers

Materials

- TS5109 Massive Transfusion Protocol Patient Worksheet
- TS5092 Blood Bank - Patient & Product Identification Form (PPI Form)

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.

- 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 O₂ 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

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7/13/2015 4:15 PM

Printed copies are for temporary reference only

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.

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

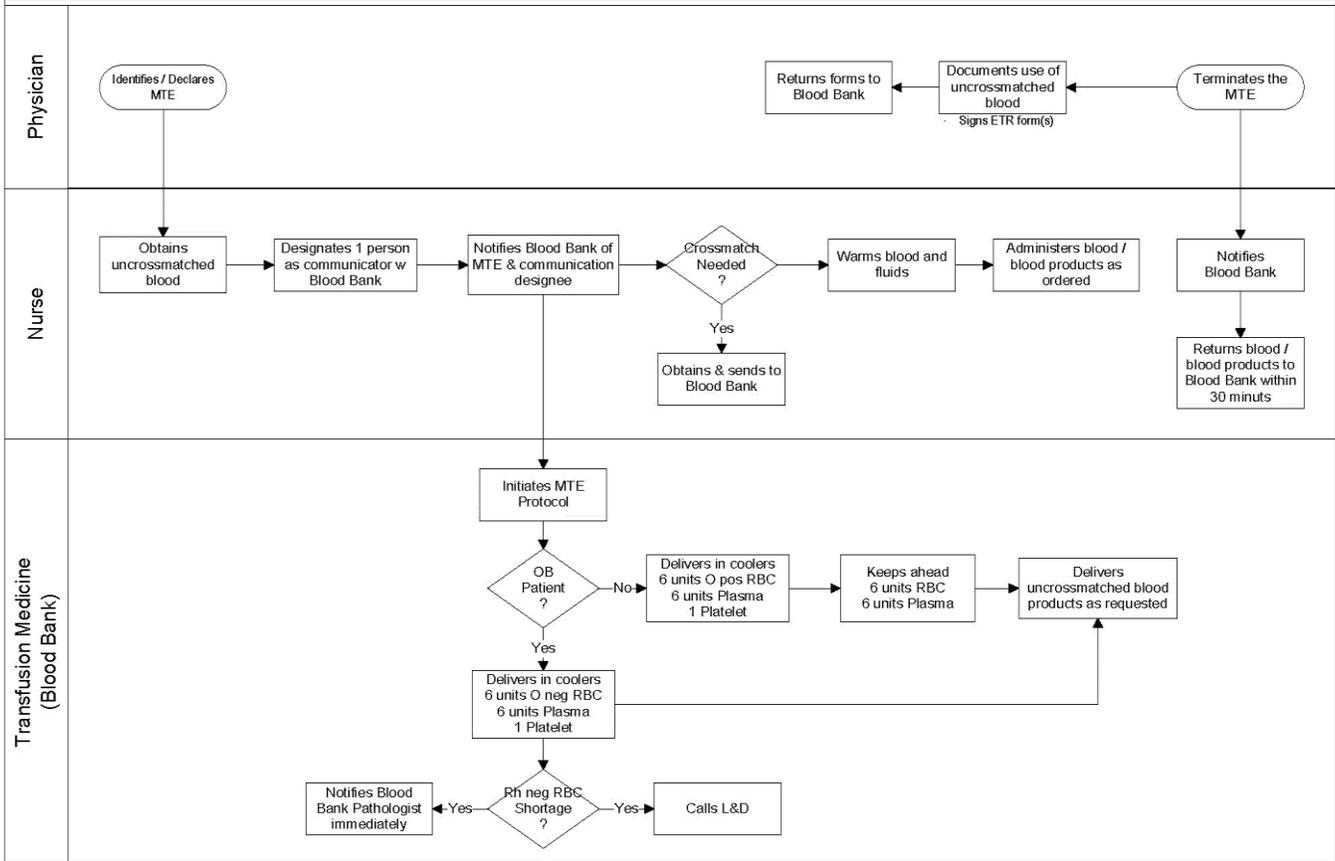
V. REFERENCES

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

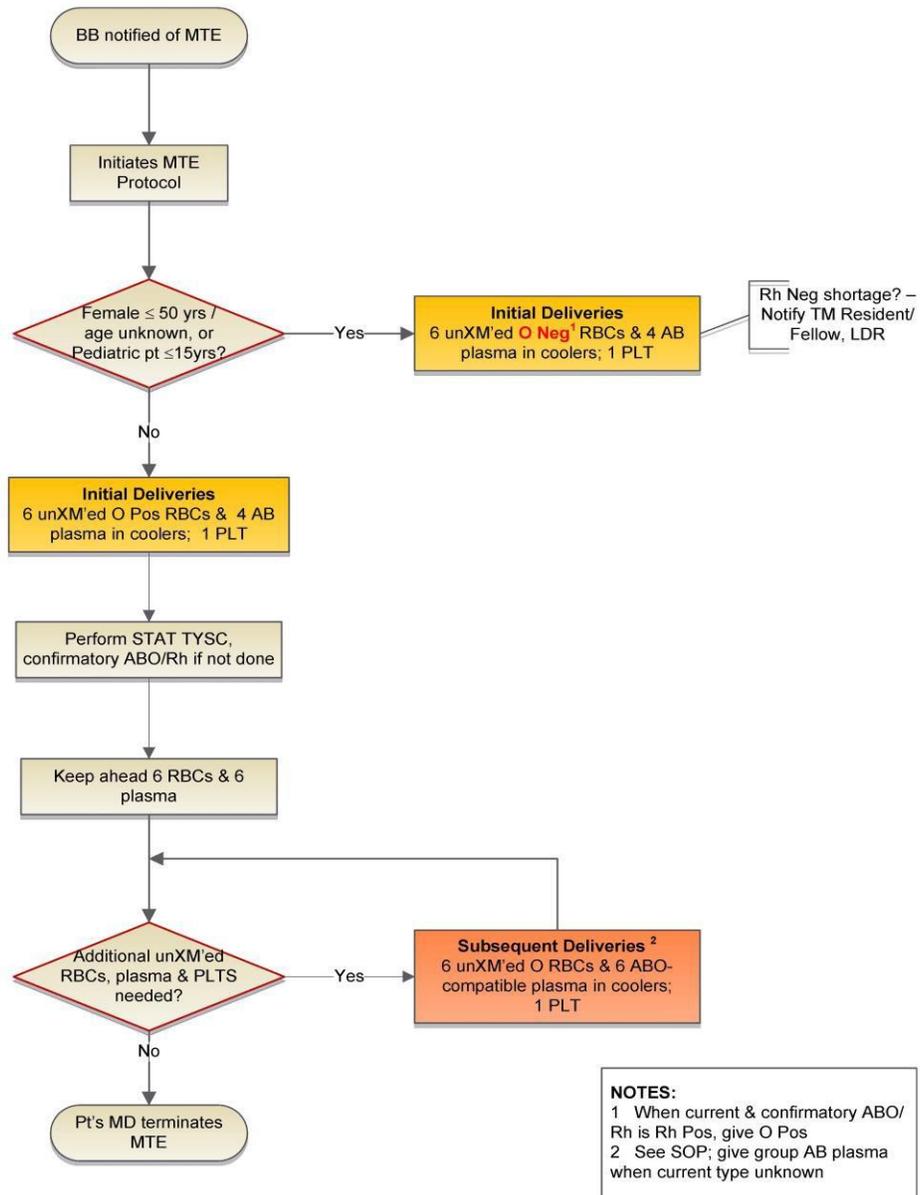
Original Effective Date: 5/2010

ATTACHMENT 1

MASSIVE TRANSFUSION EVENT (MTE) PROTOCOL



Massive Transfusion Event (MTE) Protocol



Source: <https://www.cmqcc.org/resource/3338/download>

Domain 2: Communication and Support Tools.

Following every unexpected event during childbirth, discussion with the patient and their family is critical for physical and emotional recovery. These discussions may be difficult, but should include a review of the events, interventions, current maternal status and plans for continuing care. Further details of how to structure these conversations are included below.

I. Example Patient, Family, Staff Support Guide from ACOG

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



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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

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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

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

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.rmhf.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.

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Source: <https://www.acog.org/About-ACOG/ACOG-Districts/District-II/Safe-Motherhood-Initiative>

Reporting & Systems Learning Appendix

Domain 1: Debriefing Tool and Form

Following unexpected events during the intrapartum and postpartum course, internal nonjudgmental review of the hemorrhage and team response is essential for refining processes and improving patient care. Discussion can be facilitated by debriefing tools that touch on important aspects of hemorrhage response and team preparedness. Examples of these debriefing tools are included below.

I. CMQCC Debriefing Tool



CMQCC
CALIFORNIA MATERNAL
QUALITY CARE COLLABORATIVE



California Department of
PublicHealth

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	
Team Attendance			Comments
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"/>	
Medication Administration	Yes	No	Comments
<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"/>	
Device Placement	Yes	No	Comments
<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"/>	

Fluid & Blood Product Administration	Yes	No	Comments
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"/>	
Surgical Treatment	Yes	No	Comments
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"/>	
Other Issues to Report	Yes	No	Comments
	<input type="checkbox"/>	<input type="checkbox"/>	

II. ACOG Obstetric Team Debriefing Form

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,

Identify what went well:
(Check if yes)

Communication

Role clarity (leader/supporting roles identified and assigned)

Teamwork

Situational awareness

Decision-making

Other: _____

Identify opportunities for improvement:
"human factors" (Check if yes)

Communication

Role clarity (leader/supporting roles identified and assigned)

Teamwork

Situational awareness

Decision-making

Other: _____

Identify opportunities for improvement:
"systems issue" (Check if yes)

Equipment

Medication

Blood product availability

Inadequate support (in unit or other areas of the hospital)

Delays in transporting the patient (within hospital or to another facility)

Other: _____

FOR IDENTIFIED ISSUES, FILL IN TABLE BELOW

ISSUE	ACTIONS TO BE TAKEN	PERSON RESPONSIBLE
	①	
	②	
	③	
	④	

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District II

Source: <http://www.safehealthcareforeverywoman.org/secure/smm-forms.php>