Florida Obstetric Hemorrhage Initiative (OHI): Quality Improvement in OB Hemorrhage Management

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Mission of the OHI

Decrease short- and long-term morbidity and mortality related to obstetric hemorrhage in women who give birth in Florida

Guide and support maternity care providers and hospitals in implementing successful, evidence-based quality improvement programs for obstetric hemorrhage
The Issue:

MATERNAL MORTALITY & OBSTETRIC HEMORRHAGE

Maternal Mortality Rate, California & U.S. 1999-2010

SOURCE: State of California, Department of Public Health, California Birth and Death Statistical Master Files, 1999-2010. Maternal mortality for California (deaths ≤ 42 days postpartum) was calculated using ICD-10 cause of death classification (codes A34, O00-O95,O98-O99) for 1999-2010. United States data and HP2020 Objective were calculated using the same methods. U.S. maternal mortality rates are published by the National Center for Health Statistics (NCHS) through 2007 only. Rates for 2008-2010 were calculated using NCHS Final Birth Data (denominator) and CDC Wonder Online Database for maternal deaths (numerator). Accessed at http://wonder.cdc.gov/ucd-icd10.html on Apr 17, 2013 8:00:39 PM. Produced by California Department of Public Health, Center for Family Health, Maternal, Child and Adolescent Health Division, April, 2013.
Florida Pregnancy Associated Mortality Review (FL PAMR)

- Hemorrhage is one of the top two causes of maternal mortality from 1999 to 2010 (15% of deaths) in Florida

- Causes:
  - Uterine atony/postpartum bleeding
  - Placenta accreta, percreta or increta
  - Retained placenta
  - Ruptured ectopic pregnancy
The Florida OHI Toolkit:
PREVENTION, RECOGNITION, AND MANAGEMENT OF HEMORRHAGE

The Four R’s of Obstetrical Hemorrhage

- Readiness – Ob Hemorrhage Protocol
- Recognition – Risk Assessment
- Response – Active Management & Treatment
- Reporting – Debriefing & Root Cause Analysis
Improve Readiness

**Implement standardized protocols**
- Hemorrhage Cart
- Procedural Instructions (balloons, stitches)
- Partnership with the blood bank
- Regular unit-based drills (with debriefs)
- Ensure rapid availability of medications
- Special case resources (previa, Jehovah’s Witness)
- Unit Education to protocols

Prevention/Learning

- Active Management of the 3rd Stage
- Establish a culture of Post-event Debrief/Huddle
- Review of all serious cases for systems issues
  - Mini Root Cause Analysis format
Improve Recognition

- On-going assessment of hemorrhage risk
  - Prenatally
  - On Admission
  - Prior to delivery
  - Postpartum
- Early Warning Tools for vital signs and symptoms
- Quantitative CUMMULATIVE blood loss assessment

Improve Response

- Perform regular hemorrhage drills
- Unit-standard OB Hemorrhage Protocol with checklists
- Massive transfusion protocols
Issues with Hemorrhage Response

- Denial
- Delay
- Lack of practice with rare occurrences
- Imperfect estimation/quantification of blood loss
- Poor utilization of blood products
- Insufficient communication

Improve Reporting

- Standardize definitions and consistency in coding and reporting.
- Accomplished by standardizing our definitions, following protocols, quantifying blood loss, practicing our responses, and consistent coding and reporting.
**Key Elements of the OHI**

1. Develop an Obstetric Hemorrhage Protocol
2. Develop a Massive Transfusion Protocol
3. Antepartum Risk Assessment
4. Active Management of the Third Stage of Labor
5. Quantification of Blood Loss
6. Construct an OB Hemorrhage Cart
7. Ensure Availability of Medications and Equipment
8. Perform Interdisciplinary Hemorrhage Drills
9. Debrief after OB Hemorrhage Events

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**FPQC OB Hemorrhage Care Guidelines Algorithm**

Available as part of the OHI Toolkit
1. Develop an Obstetric Hemorrhage Policy

Why a Protocol for Obstetric Hemorrhage?

- Now a complex series of steps that involve many staff members and departments
- Communications!
- PPH seems to always happen at night or weekends...(when people may be tired or there are less resources)
- We can improve...
Core Elements of Any Protocol

- Develop an effective written document for responding to maternal hemorrhage
- Rapid response to hemorrhage emergency
- Coordination among:
  - physicians
  - nurses
  - anesthesiologists
  - blood bank
- Complete set of prewritten orders to instantly execute
- Escalation through stages

2. Massive Transfusion Protocol
Lessons from Combat in Iraq

- Lowest losses ever from hemorrhage
- Key: increased FFP:RBC ratio

“Whole blood” is good for OB hemorrhage

- After 2u PRBCs, start FFP
- Massive transfusion protocol: 1:1 ratio FFP/RBC
  - 6 RBC + 4 FFP + 1 plt pack (Stanford+)
  - 4 RBC + 4 FFP, plts and cryo on request (CPMC)--think ahead!
- Keep up!

Two Stages: Resuscitation and Treatment

- Resuscitation, transfuse per clinical signs
- DIC treatment, transfuse per lab parameters

Supportive measures are critical

- Warm patient (Bair Hugger®, fluid warmer)
- Correct metabolic acidosis
Recommendations: Massive Transfusion Protocol

- Every OB unit needs one!
- Coordinated with Blood Bank, Anesthesia, and ER/ICU
- Ability to deliver large volumes of RBCs and coagulation products
- Principle: Whole blood out = whole blood in
- Guidelines for coagulation product usage

3. Antepartum Risk Assessment
Risk Assessment

- Risk factor identification
- A prewritten order set for admission to L&D includes “risk scoring” for obstetric hemorrhage
- Definition checklist
- Risk assessment can also occur intrapartum

Ongoing Hemorrhage Risk Assessment

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<th></th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
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<tbody>
<tr>
<td>Antepartum</td>
<td>• No previous uterine incision</td>
<td>• Prior cesarean birth(s)</td>
<td>• Placenta previa</td>
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<td></td>
<td>• Singleton pregnancy</td>
<td>• Prior uterine surgery</td>
<td>• Low-lying placenta</td>
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<td>• ≤ 4 previous vaginal births</td>
<td>• Multiple gestation</td>
<td>• Suspected placenta accreta</td>
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<td></td>
<td>• No known bleeding disorder</td>
<td>• &gt;4 previous vaginal births</td>
<td>• Hematocrit &lt;30</td>
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<td></td>
<td>• No history of PPH</td>
<td>• Hypertension-associated Conditions</td>
<td>• Platelets &lt;100,000</td>
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<tr>
<td></td>
<td></td>
<td>• History of previous PPH</td>
<td>• Active bleeding at admission</td>
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<td></td>
<td></td>
<td>• Large uterine fibroids</td>
<td>• Known coagulopathy</td>
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<td></td>
<td></td>
<td>• Estimated fetal weight greater than 4 kg</td>
<td>• Abruptio Placenta</td>
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<tr>
<td></td>
<td></td>
<td>• Morbid obesity (BMI &gt; 35 kg/m²)</td>
<td></td>
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<td></td>
<td></td>
<td>• Polyhydramnios</td>
<td></td>
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<tr>
<td>Intrapartum</td>
<td>• Induction or augmentation of labor</td>
<td>• Protracted labor or arrest disorder</td>
<td></td>
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<td></td>
<td></td>
<td>• Chorioamnionitis</td>
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4. Active Management of the Third Stage of Labor

- Oxytocin (10u) IV or IM with delivery of infant or placenta
- Vigorous fundal massage (at least 15 sec) after placenta delivery

Controlled cord traction is an optional component to be applied only by a skilled care provider.
5. Quantification of Blood Loss

- EBL method used most often is visual estimation
- Visual estimation is unreliable and inaccurate
- Underestimated as much as 50% of time
- Institute most accurate methods: Quantification of Blood Loss

- Accurate QBL prompts the Nurse on critical actions such as mobilizing the team
- Critical decisions are made based on QBL
- QBL leads to earlier interventions & improved outcomes
Dry Weights

- Peach peripad = 25 gm
- Green Chux pad = 540 gm
- Pink Chux pad = 440 gm
- Patient gown = 565 gm
- Large gown = 490 gm
- Towel = 280 gm
- Wash cloth = 48 gm
- Raytex 4 x 4 = 6 gm
- Blue Towel = 55 gm
- Baby Blanket = 125 gm
- Bed sheet = 480 gm
- Blanket adult = 600 gm
- Comforter = 1200 gm
- Extra large gown = 515 gm
- Lip = 20 gm

Procedure for Quantification of Blood Loss (QBL)

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

1 gram = 1 ml

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

Visual Estimation of Blood Loss

- 25 ml blood saturates about 50% area
- 50 ml blood saturates about 75% area
- 75 ml blood saturates entire surface
- 100 ml blood will saturate entire top and shirt

Recommendations

Many centers will customize their approach to quantification using a combination of approaches for different settings:

- Vaginal deliveries
- Cesarean sections
- Minimal loss
- Greater than usual loss
- Massive loss

The process is intentional—a formal effort!

- No more vague “Guesstimates”
- Continues and is cumulative
Who should determine QBL?

- Anesthesia is at the head of the table and often does not see it all.
- OB’s aren’t looking at the suction bottles or at the collective sponges.
- No one is doing it in a standardized manner—obstetricians need help! Collaboratively!
- We should be able to answer:
  - How much blood is in the suction bottle (after amniotic fluid)?
  - How much blood is on sponges?
  - How much blood is on the floor/on the table?
  - In a big case, hourly and cumulatively.

6. Construct an Obstetric Hemorrhage Cart
Hemorrhage Carts, Kits and Trays

**Checklist of medications and procedures**
- Diagrams depicting various procedures
- B-Lynch
- Uterine artery ligation
- Balloon placement
- Set of vaginal retractors
- Sponge Forceps
- B-Lynch sutures
- Vaginal Packs
- Uterine Balloons
- Banjo curettes
- Uterine forceps
- Long needle holder

7. Ensure Availability of Medications and Equipment
OB Hemorrhage Medication Kit
PYXIS/refrigerator

- Pitocin 20 units per liter NS 1 bag
- Hemabate 250 mcg/ml 1 ampule
- Methergine 0.2 mg/ml 2 ampule
- Cytotec* 200mg tablets 5 tabs

*There is no strong evidence that misoprostol is useful as primary or adjunctive therapy of postpartum hemorrhage in addition to standard injectable uterotonics.

Bakri Balloon  B-Lynch suture
Importance of Drills / Simulations
Safety and QI Leader: Paul Preston, MD

“Medicine is the last high-risk industry that expects people to perform perfectly in complex, rare emergencies but does not support them with high-quality training and practice throughout their careers.”

“Certain individual and team skills require regular practice that cannot ethically occur in routine care.”
Simulation Drills

Hospitals should run drills at different times of the day to ensure that appropriate hemorrhage team members are available at all times.

All members of the health care team should participate, including nurses, physicians and ancillary staff, as appropriate.

Debriefings should occur after every drill and after every actual OB hemorrhage emergency.

This allows for continuous quality improvement.

9. Debrief after OB Hemorrhage Event
Debriefs

- After major OB hemorrhage event or simulation drill, provides opportunity to:
  - Decompress
  - Discover areas for improvement
  - Benefit from immediate feedback

- Enhances retention of information
- Increases learner engagement
- Leads to higher staff confidence
- Is a learning opportunity, not punitive

Debriefing

- Led by facilitator (primary RN and primary MD)
- Includes:
  - Recap of the situation
  - Key events that occurred
  - What worked
  - What did not work
    - E.g. communication, lack of necessary equipment
  - Discussion of what can be done differently
- Completion of a debrief form
We Can Make a Difference
Systems Approach to Obstetric Hemorrhage

- Organize your unit and your response
- Recognize Denial and Delay
  - Get help
  - Get exposure to perform thorough exams and identify the source of bleeding
  - Do not get behind
- Process is important!

Systems Approach to Obstetric Hemorrhage

- Department: OB Hemorrhage Protocol with stages
- Hospital: Massive Transfusion Protocol
- Summary Flow algorithm: graphic or tabular
- Nursing checklist by stages
- Documentation forms: OB Hemorrhage Report
- Worksheets to assist with assessment of blood loss
- Hemorrhage cart/kit
- Instruction cards for new procedures in cart or OR
- Drills
Can we lower the frequency and morbidity/mortality of OB hemorrhage?

Lower the incidence:
- Reduce the cesarean birth rate (both primary and repeat)
- Reduce chorioamnionitis
- Fewer multiple gestations
- Reduce long inductions of labor
- Reduce long second stages

Respond rapidly to OB hemorrhage:
- Use the new techniques and respond in an organized, well-executed, timely fashion
- Keep a small hemorrhage from evolving into a massive hemorrhage

Resources
OHI Toolbox for Hospital Implementation

- The Florida Obstetric Hemorrhage Initiative Toolkit
- Three OHI slide set modules for clinician education:
  - Module 1: Maternal Mortality and Obstetric Hemorrhage
  - Module 2: The Florida OHI Toolkit
  - Module 3: Hospital Level Implementation Plan of the OHI
- Care guidelines, best practice tools, sample forms
- Archived webinars on OB Hemorrhage topics
Resources and More Information available at:
http://health.usf.edu/publichealth/chiles/fpqc/ohi

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QUESTIONS OR COMMENTS