Strategies to Improve Postpartum Hemorrhage Outcomes
Objectives

• Describe the Association of Women’s Health, Obstetric and Neonatal Nurses (AWHONN) Postpartum Hemorrhage Project: A Multi-Hospital Quality Improvement Program.

• Discuss Implementation Strategies and Outcome Measures for Postpartum Hemorrhages.
Definition of a Post Partum Hemorrhage

• Post Partum Hemorrhage (PPH) is defined as a 10% decrease in hematocrit from admission assessment to postpartum data collection and the need to administer a transfusion of red blood cells (RBC’s) or hemodynamic instability. (Oyelese & Ananth, 2010; Rajan & Wing, 2010)

• Postpartum Hemorrhage is the leading cause of maternal morbidity and mortality worldwide. (Callaghan et al., 2010; Driessen et al., 2011; You & Zahn, 2006)
Scope of the Problem

- PPH results in 150,000 deaths per year worldwide.
- 1 in every 1000 births in the world is complicated by maternal death from hemorrhage. (Khan et al., Lancet 2006; 367: 1066-74)
- > 90% of deaths are preventable.
- > 50% of severe morbidity is preventable.
Severe Morbidity

- PPH is (one of the top 3 causes along with hypertension and embolism) leading cause of maternal morbidity and mortality in the United States including the District of Columbia.

- National PPH incidence is 2.9% of all births.

- 1 in 1,500 births are complicated by an ICU admission following a PPH.

- 2nd leading indication for ICU admission after hypertensive disorders of childbirth.

Sequelae following PPH include:

- Acute renal failure 29.3%
- Acute respiratory failure 24.6%
- Coagulopathy 11.7%
- Prolonged mechanical ventilation 16.5%

Wanderer, Leffert, Mhyre, Callaghan, Bateman, Critical Care Medicine. 2013; 41 (8): 1844-52

Etiologies

4 T’s

• Tone: uterine atony 80%

• Tissue: retained placenta
  accreta/increta/percreta

• Trauma: lacerations of cervix, vagina/perineum
  vessel laceration with cesarean
  uterine rupture
  uterine inversion

• Thrombin: pre-existing coagulopathy
  disseminated intravascular coagulopathy (DIC)
  hemolysis, elevated liver enzymes and low platelets (HELLP)
  amniotic fluid embolus (AFE)
  anticoagulation
## Risk Factors

<table>
<thead>
<tr>
<th>Medium Risk</th>
<th>High Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple Gestation</td>
<td>Placenta previa, low lying placenta</td>
</tr>
<tr>
<td>&gt; 4 previous births</td>
<td>Suspected accreta or percreta</td>
</tr>
<tr>
<td>Chorioamnionitis/Sepsis</td>
<td>Hematocrit &lt; 30 AND other risk factors</td>
</tr>
<tr>
<td>History of one previous PPH</td>
<td>Platelets &lt; 100,000</td>
</tr>
<tr>
<td>Family history of PPH in first degree relative</td>
<td>History of &gt; 1 previous PPH</td>
</tr>
<tr>
<td>EFW &gt; 4kg</td>
<td>Known coagulopathy</td>
</tr>
<tr>
<td>Morbidly obese (BMI &gt;35)</td>
<td>Retained products post delivery</td>
</tr>
<tr>
<td>Induction</td>
<td>Polyhydramnios</td>
</tr>
<tr>
<td>Large uterine fibroids</td>
<td>Uterine atony</td>
</tr>
<tr>
<td>Operative Delivery</td>
<td>Lacerations, episiotomy</td>
</tr>
</tbody>
</table>

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Simpson, Creehan  Perinatal Nursing, 2014
Association of Women's’ Health, Obstetrics and Neonatal Nurses (AWHONN)

AWHONN is the standard-bearing and foremost nursing authority that advances the health care of women and newborns through evidenced-based nursing practice.
Overview of AWHONN Postpartum Hemorrhage (PPH) Project

- Evidenced-based research based part of the California Maternal Quality Care Collaborative (CMQCC).
- Multidisciplinary project extending from July 2014 until December 2015.
- Established two Quality Improvement Collaboratives.
  * NJ/DC hospitals.
  * Georgia hospitals.
- Hospital team members consisted of:
  * Nurses
  * Obstetrical providers (physicians and midwives)
  * Anesthesia providers
  * Transfusion specialists (Blood bank team members)
  * Hospital administration

- Each hospital had to submit an application and baseline information regarding practice and process for PPH.
AWHONN PPH Project

Goals

• Promote equal access of evidence-based care practices.

• Support effective implementation strategies and tactics to improve clinician practice.

• Identify facilitators and barriers to making improvements and disseminate lessons learned.
Key Practice Changes to Implement

• Risk Assessments (admission, ½ hour before delivery and within 2 hrs. post delivery).
• Quantitative Blood Loss (QBL), instead of Estimated Blood Loss (EBL).
• Massive Transfusion Protocol.
• Simulation (High and Low Fidelity) Drills.
• Education Modules.
• Debriefings.
• Practice Brief for administration of oxytocin.
Quality Improvement “MAP-IT” Methodology

Source: http://healthypeople.gov/2020/implement/MAP-IT.aspx
Mobilize

AWHONN

- Interdisciplinary Expert Panel.
- Hospital key informants (baseline survey).
- Leaders from various sectors (state and national).
- Select hospitals from either New Jersey/District of Columbia or Georgia.

Hospitals

- Identify QI team leaders from a multidisciplinary team, OB providers, Anesthesiologists, Nurses, Transfusion Services, Senior Hospital Executives.
- Recruit QI champions.
Assess – Phase 1 Applications

AWHONN

• Hospitals in the 3 designated areas were invited to electronically complete a baseline survey.
  * Motivations and incentives given to encourage participation.
  * Letter of support from State Commissioners of Health to encourage hospitals involvement.
  * Copy of the AWHONN Obstetric monograph given to hospitals that completed the baseline survey.
  * Only hospitals that completed the baseline survey were invited to participate in one of the two QI collaboratives.

Hospitals

• Based on data submitted, each hospital needed to determine their strengths and weaknesses.
• Assess hospitals willingness for change.
• Determine preparedness of facility.
• Identify actual and potential clinical barriers ie: lack of supplies.
• Identify actual and potential leadership barriers.
Assess – Phase 2 Selection

Phase 2 Hospital selection:
Hospitals selected to participate in one of the two collaboratives were asked for additional baseline data, including:

- A safety and culture attitude survey.
- RN staffing ratios.
- A completed application with key demographic data and letters of support.
- Hospitals were instructed to review:
  PPH tools including AWHONN PPH Management Algorithm
  AWHONN Practice Brief for Oxytocin Administration
  AWHONN Practice Brief for Quantification of Blood Loss (QBL).

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Plan

Each hospital in the collaboratives were instructed:

• To have a consensus on areas for improvement and ideas for implementing and sustaining change.
• Set attainable goals.
• Start with “small” quick wins.
• Develop timeline with realistic dates.
• Document on PPH MAP-IT Worksheet to track progress, challenges and successes.
• Develop strategies to motivate.
• Develop budget for any additional materials needed.
Plan

• Schedule monthly or bimonthly team meetings at set times.
• Develop a plan for locating, submitting and reviewing monthly data.
• Acknowledge that levels of support and resistance will emerge and vary in response to change.
• Establish clear policies and procedures for PPH management.
• Participate in monthly conference calls and share what is working or not working.
Implement

- Decide on official start dates, “birth day” for each process change.
- Make sure PPH tools available for staff.
- Order and/or provide supplies ie: scales for weighing blood loss, under buttocks drapes.
- Develop educational “fun activities” to engage staff.
- Schedule Grand Rounds.
- Instruct staff on completing AWHONN PPH Educational Modules and submit their certificates of completion.
- Conduct interdisciplinary PPH simulation drills.
- Establish PPH patient education.
- Communicate, communicate, communicate.
- Update staff at staff meetings or other venues.
Implement

- Post materials and tools on the unit.
- Communicate positives and negatives.
- Seek ongoing feedback.
- Discuss with management team the possibility of providing incentives.
- Be aware of signs of “change fatigue”.

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Track

- Designate leader (provider or nurse) to perform monthly review of 30 randomly selected medical records.
- Submit QI Intensity Data on the PPH project website portal.
- Conduct regular meetings at all phases of the project.
- Encourage questions from staff and feedback at all phases.
- Continue to identify facilitators and barriers.
- If change is not happening or not happening fast enough, go back and re-do MAP-IT.
- Develop new strategies as needed.
Implementing strategies to improve response to PPH at MedStar Washington Hospital Center (MWHC)

First steps…

- Agreed to submit baseline data information to AWHONN.
- Submitted application.
- Support letters signed by key stakeholders ie: chief nursing executive, director of anesthesia, director of simulation.
- Received notification of acceptance into the project by AWHONN.
- Presented overview of project and proposal to Perinatal Patient Safety Program committee (PPSP).
- Discussed at weekly multidisciplinary Leadership meeting.
Implementing strategies to improve response to PPH at MWHC

Secondary steps…
• Director of Nursing Research obtained IRB approval.
• Designated Project Leader.
• Designated Physician Champion.
• Discussed at PPSP committee.
  * Identified what our strengths are.
  * Identified opportunities for improvement.
  * Identified what we needed to change.
  * Discussed a realistic timeline.
• Met AWHONN Director of Data Analytics at AWHONN conference.
• Attended AWHONN kick off in NJ in June 2014.
• Submitted additional data to AWHONN.
Implementing strategies to improve response to PPH at MWHC

Continuation of Process...

- Established focus groups for each key initiative.
- Communicated with associates and providers via a variety of methods.
- AWHONN education modules rolled out with a set date for completion.
- AWHONN Risk Assessment check sheets taken to Forms Committee for approval.
- Risk forms laminated and placed in every patient room and at the nurse’s station.
- Education and expectation on the use of Risk Assessment Tool.
- Implementation of Risk Assessment.
Implementing strategies to improve response to PPH MWHC

• Monthly audits and data continued.
• Guidelines for use of when to debrief established.
• Debrief tool initiated.
• Simulations continued as per pre-project.
• Developed QBL forms. Not a permanent part of the chart.
• Ordered calibrated under buttocks pads.
• Ordered more baby scales- to be used for QBL.
• Reviewed forms and QBL concept with all staff.
• Made changes to forms based on staff recommendations.
• Educated staff on use of forms and QBL process.
• QBL rolled out by risk level in L&D over a 2 month period.
• QBL roll out to postpartum units.
Submit Initial Data to AWHONN July, 2014

Establish focus groups for each key area August 2014

Provide AWHONN with monthly data

IRB Approval July 2014, re-approval July 2015

Roll out education to staff and providers Oct. 2014

Risk Assessment Tools January 2015

Initiate Debriefing for PPH with MTP or > 4 u RBC May 2015

Change from EBL to QBL August 2015

Report out to AWHONN, make sure all data sent to AWHONN June 2016
Outcome Data Collection Sheets
Data Reported monthly to AWHONN from July 2014 to December 2015

• Total number of deliveries.
• Total number of maternal deaths.
• Total number of red blood cells/fresh frozen plasma/platelet packs or blood products transfused (information from blood bank).
• Total number of women receiving blood products.
• Total number who received > 4 units of blood products.
• Total number of women who had a peripartum hysterectomy.
• Total number of women admitted to the ICU.
• Total number of women admitted to the ICU for reason other than PPH.
• Process data collection items-audit of 30 charts.
Data reported Quarterly to AWHONN from July, 2014 to December, 2015

• Intensity Date Collection Items.

• Structure Date Collection Form.
Example of Data Collection Tool

### Outcome Data Collection Items

**Collected Monthly**

<table>
<thead>
<tr>
<th>Question #</th>
<th>Description</th>
<th>Definition or Data Collection Pointers</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>Total number of women who gave birth (greater than or equal to 20 0/7 weeks gestation) for the month</td>
<td>Collect information from birth log or appropriate DRG codes. The typical maternity MS-DRG (765, 766, 767, 768, 770, 777, 779) can be used to restrict the typical labor and delivery population (≥20 weeks of gestation). You may be able to use ICD-9-CM codes 72–75, V27, or 650–659 to identify these patients.</td>
<td></td>
</tr>
<tr>
<td>Q2</td>
<td>Total number of women who died during the birth admission (greater than or equal to 20 0/7 weeks gestation) for the month</td>
<td>1. Identify all women who gave birth during the month (≥20 weeks of gestation). 2. Of this population, identify any women who died during the birth admission. 3. Total the number of women who died. Note: This number is intended to capture all maternal deaths and not limited to PPH deaths.</td>
<td></td>
</tr>
<tr>
<td>Q3</td>
<td>Total number of units of red blood cells transfused for women during the birth admission (greater than or equal to 20 0/7 weeks gestation) for the month</td>
<td>1. Identify all women who gave birth during the month (≥20 weeks of gestation). 2. Of this population, identify any women who also received a red blood cell transfusion. 3. Total the number of units of red blood cells transfused for all women receiving red blood cell transfusions. Note: Work with your blood bank colleagues to determine this number.</td>
<td></td>
</tr>
<tr>
<td>Q4</td>
<td>Total number of units of fresh frozen plasma transfused for women during the birth admission (greater than or equal to 20 0/7 weeks gestation) for the month</td>
<td>1. Identify all women who gave birth during the month (≥20 weeks of gestation). 2. Of this population, identify any women who also received a fresh frozen plasma transfusion. 3. Total the number of units of fresh frozen plasma transfused for all women receiving fresh frozen plasma transfusions. Note: Work with your blood bank colleagues to determine this number.</td>
<td></td>
</tr>
<tr>
<td>Q5</td>
<td>Total number of units of platelet packs (whole blood pool or apheresis) transfused for women during the birth admission (greater than or equal to 20 0/7 weeks gestation) for the month</td>
<td>1. Identify all women who gave birth during the month (≥20 weeks of gestation). 2. Of this population, identify any women who also received a platelet packet transfusion. 3. Total the number of units of platelet packets transfused for all women receiving platelet pack transfusions. Note: Work with your blood bank colleagues to determine this number.</td>
<td></td>
</tr>
</tbody>
</table>

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**Example of Risk Assessment Tool**

### POSTPARTUM HEMORRHAGE (PPH) RISK ASSESSMENT TABLE

<table>
<thead>
<tr>
<th>Risk Category: Pre-Birth (Approximately 30 to 60 minutes prior to giving birth)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low Risk</strong></td>
</tr>
<tr>
<td>INCLUDE ADMISSION LOW RISK FACTORS</td>
</tr>
<tr>
<td>- Labor greater than 18 hours</td>
</tr>
<tr>
<td>- Temperature greater than 100.4°F</td>
</tr>
<tr>
<td>- Augmentation of labor (with oxytocin)</td>
</tr>
<tr>
<td>- Magnesium sulfate</td>
</tr>
<tr>
<td>- Prolonged second stage (&gt;2 hours)</td>
</tr>
<tr>
<td><strong>Medium Risk</strong></td>
</tr>
<tr>
<td>INCLUDE ADMISSION MEDIUM RISK FACTORS</td>
</tr>
<tr>
<td>- Has 2 or more medium risk factors</td>
</tr>
<tr>
<td>- Active bleeding more than “bloody show”</td>
</tr>
<tr>
<td>- Suspected abruption</td>
</tr>
<tr>
<td><strong>High Risk</strong></td>
</tr>
<tr>
<td>INCLUDE ADMISSION HIGH RISK FACTORS</td>
</tr>
</tbody>
</table>

### Anticipatory Interventions:

- Monitor patient for any change in risk factors during labor and implement anticipatory interventions as indicated.

<table>
<thead>
<tr>
<th>Blood Bank Order Change blood bank orders as needed if risk category changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Clot Only (Type and Hold)</td>
</tr>
<tr>
<td>- Ensure the availability of calibrated drapes, scales to weigh and measure blood loss for every birth</td>
</tr>
<tr>
<td>- Review the hemorrhage protocol</td>
</tr>
<tr>
<td>- Review lab work, e.g., platelets (PLTs), hemoglobin (Hgb)</td>
</tr>
<tr>
<td>- Notify the Provider and Charge Nurse</td>
</tr>
<tr>
<td>- Initiate and/or maintain IV access</td>
</tr>
<tr>
<td>- Confirm availability of Anesthesia Provider</td>
</tr>
<tr>
<td>- Ensure uterotonic (oxytocin, Methergine, Hemabate, misoprostol) and supplies for administration (such as syringes, needles, alcohol swabs) are immediately available</td>
</tr>
<tr>
<td>- Ensure that the hemorrhage supplies are near the patient’s room</td>
</tr>
<tr>
<td>- Transfer from a birthing center to an intrapartum unit</td>
</tr>
<tr>
<td>- Ensure the availability of calibrated drapes, scales to weigh and measure blood loss with every birth</td>
</tr>
</tbody>
</table>

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MedStar Washington Hospital Center
Example of QBL Work Sheet

QBL Worksheet for Vaginal Births

Part 1: The Drape
- Amputate in drape @ end of case
- Pre-placenta amount in drape
- Peri-bottle amount used (if in the drape)
- Blood clots in drape (weight)

QBL of drape =

| PART 2: Weighed Items | Individual Item Name | # of Items weighed | \( \times \) Item dry weight | =
|----------------------|----------------------|--------------------|---------------------------|---------|

| Example: C777 X     |                      |                    |                          |         |
| x                   | y                   | z                  |                          |         |

Calculated WT of dry items used

<table>
<thead>
<tr>
<th>PART 3: Totals</th>
<th>QBL of Drape</th>
<th>(from Part 1)</th>
<th>QBL of Weighed Items</th>
<th>(from Part 2)</th>
<th>+</th>
</tr>
</thead>
<tbody>
<tr>
<td>QBL of Drape</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QBL Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>WT</th>
<th>Item</th>
<th>WT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Chux</td>
<td>85</td>
<td>Gown (white)</td>
<td>300</td>
</tr>
<tr>
<td>Paper lap</td>
<td>25</td>
<td>Gown (green)</td>
<td>330</td>
</tr>
<tr>
<td>Cloth lap</td>
<td>15</td>
<td>Blanket</td>
<td>600</td>
</tr>
<tr>
<td>Cloth lap w/ging</td>
<td>15</td>
<td>Fitted sheet</td>
<td>555</td>
</tr>
<tr>
<td>Matroc (“mat”)</td>
<td>3</td>
<td>Flat sheet</td>
<td>525</td>
</tr>
<tr>
<td>Under-buttocks drape</td>
<td>125</td>
<td>Pillowcase</td>
<td>100</td>
</tr>
<tr>
<td>Blue paper drape</td>
<td>95</td>
<td>Towel</td>
<td>180</td>
</tr>
<tr>
<td>Blue “wrap” for delivery pack</td>
<td>163</td>
<td>Washcloth</td>
<td>25</td>
</tr>
<tr>
<td>Placenta (plac) bucket</td>
<td>55</td>
<td>Baby</td>
<td></td>
</tr>
<tr>
<td>Rectangular plastic basin</td>
<td>84</td>
<td>Baby blanket</td>
<td>120</td>
</tr>
<tr>
<td>Large peri-pad</td>
<td>72</td>
<td>EIFM band (1)</td>
<td>25</td>
</tr>
<tr>
<td>Small maxi-pad</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ice pack peri-pad</td>
<td>175</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mesh panties (boyshort)</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Key Practice Changes Implemented at MWHC

- PPH Admission Risk Assessment documentation compliance consistently >90% since June 2015.
- QBL practice and documentation compliance consistently >90% since August 2015.
- Interdisciplinary input created a Massive Transfusion Protocol (MTP) for obstetrics based on MWHC Massive Transfusion Protocol.
- 58% of clinicians (nurses and obstetrical providers) participated in PPH drills during the project time frame.
- Simulation drills continue every other month.
- 92% of clinicians completed education modules.
- Debriefings occur following births that utilize the MTP or patient receives > 4 units of blood products.
- Change in practice for administration of oxytocin in progress.
Results from PPH Project
Completion of Risk Assessment on Admission to L&D
Results from PPH Project
Documentation of QBL
Barriers

- Lack of buy-in from all disciplines.
- Competing priorities across the hospital.
- Inability to make changes to EMR.
- Processes that are not “change friendly.”
- Dedicated personnel to work on the project.
Lessons Learned

• Change takes time- be patient.
• You can’t do it yourself- it takes a village.
• Utilize all your resources.
• Make changes in baby steps, do not expect to solve world peace.
• Make sure steps are hardwired before moving on.
• Don’t give up even though you may want to.
• AWHONN has numerous resources available.
• To access go to the AWHONN website.
References


You can have good outcomes even with this!!


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