Deployment of Maternal Safety Bundles in Your Hospital

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We, the speakers for this presentation, have no conflicts of interest or financial relationships to disclose.
Objectives

- The participant will discuss opportunities for improvement in management through the use of obstetric safety bundles.

- The participant will be able to identify barriers to and options for implementation of OB safety bundles in his/her respective institution.

- The participant will recognize the potential role of South Carolina in the Alliance for Innovation on Maternal Health (AIM) program.
Through case presentation, what are opportunities for improvement in management through the use of obstetric safety bundles?
Patient

- G2P1
- 40 years old
- Ht: 5 ft 5 in  Weight: 275  BMI = 45.8
- Family Hx: Mother coronary artery disease, father chronic hypertension
- OB Hx:
  - G1 – SVD 15 years ago, healthy baby girl 8lb 10 oz
  - Current pregnancy
    - B/P Range 135 – 150 / 80 -90
    - Nuchal translucency positive
    - Patient received 2nd trimester screening
    - Glucose screening + Gestational diabetes
- Medical Hx
  - No documentation of elevated pressures prior to pregnancy
  - No screening previously completed for diabetes
  - Smokes ½ pack of cigarettes daily

Is this patient at risk for complications in labor, birth and postpartum?

Table 1. World Health Organization Body Mass Index Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>BMI*</th>
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<tbody>
<tr>
<td>Underweight</td>
<td>Less than 18.5</td>
</tr>
<tr>
<td>Normal weight</td>
<td>18.5 – 24.9</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0 – 29.9</td>
</tr>
<tr>
<td>Obesity class I</td>
<td>30.0 – 34.9</td>
</tr>
<tr>
<td>Obesity class II</td>
<td>35.0 – 39.9</td>
</tr>
<tr>
<td>Obesity class III</td>
<td>40 or greater</td>
</tr>
</tbody>
</table>

Abbreviation: BMI, body mass index.
*Weight in kilograms divided by height in meters squared (kg/m²).
Case Continued...
Patient Admitted to Labor & Delivery

- Patient Presents to a Level 2 hospital
  - Admitted for Induction of Labor
- GA: 38 5/7
- Cervix: 2/50/high
- VS: 150/95, 110, 20, 98.3
- Denies Vaginal Bleeding, ROM, Headache, Blurred Vision

Questions?
- What are our risk factors now?
- How can we support intended vaginal birth in a patient with risk factors?
Case Continued... Intrapartum/delivery

**Delivery**
- FHR non-reassuring
- STAT C/S
- Baby boy
  - 9 lb 15 oz
  - To Special Care Nursery
- EBL: 1000cc in OR

**In PACU**
- Vaginal bleeding continues, noted by nurse to be moderate to severe
- VS: 150/110, 165, 22, 98.9
- Continue Uterine Massage
- EBL: 200 cc – 300 cc
- Patient deemed stable for transfer to Postpartum Floor

**Postpartum Unit**
- VS: 70/50, 180, 24, 98.9
- Noted continued “Heavy” Lochia
- MD called
  - MD in another delivery
  - Received order for Hemabate
Case Continued...
Patient in Postpartum

- Meds*
- Equipment*
- Staff*
- Response Team
- Patient continues to bleed
Where There Problems with this Case?

- Pregnancy Risk Factors
- Induction of Labor / Supporting Vaginal Birth → reduction of Cesarean births
- Recognition of Complications
- Response to Complications
Quick Facts:
- 830 women every day preventable causes r/t pregnancy & birth
- 99% of all maternal deaths occur in developing countries
- Maternal mortality is higher in rural areas and poorer communities
- Young adolescents face a higher risk of complications and death

http://gamapserver.who.int/mapLibrary/Files/Maps/Global_mmr_2015.png
http://www.who.int/mediacentre/factsheets/fs348/en/
Maternal Mortality Trends in US

Overall Mortality

Mortality by Race/Ethnicity

*Note: Number of pregnancy-related deaths per 100,000 live births per year.*
Causes of Maternal Mortality

http://www.cdc.gov/reproductivehealth/maternalinfanthealth/pmss.html

ACOG/SMFM - Obstetric Care Consensus Statement: Number 5, September 2016
Severe Maternal Morbidity: Screening and Review

- **Recommendations**
- Facilities should have a screening process in place to detect cases of severe maternal morbidity for review.
  - The College and SMFM recommend using two criteria to screen for severe maternal morbidity:
    1) transfusion of 4 or more units of blood and
    2) admission of a pregnant or postpartum woman to an ICU.
  - Institutions may choose to incorporate additional screening criteria to highlight cases for detailed review.

Severe Maternal Morbidity

<table>
<thead>
<tr>
<th>Severe Maternal Morbidity</th>
<th>Not Severe Morbidity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hemorrhage</strong></td>
<td></td>
</tr>
<tr>
<td>Obstetric hemorrhage with ≥4 units of red blood cells transfused</td>
<td>Obstetric hemorrhage with 2–3 units of red blood cells transfused ALONE</td>
</tr>
<tr>
<td>Obstetric hemorrhage with 2 units of red blood cells and 2 units of fresh frozen plasma transfused (without other procedures or complications) if not judged to be overexuberant transfusion</td>
<td>Obstetric hemorrhage with 2 units of red blood cells and 2 units of fresh frozen plasma transfused AND judged to be “overexuberant”</td>
</tr>
<tr>
<td>Obstetric hemorrhage with &lt;4 units of blood products transfused and evidence of pulmonary congestion that requires &gt;1 dose of furosemide</td>
<td>Obstetric hemorrhage with &lt;4 units of blood products transfused and evidence of pulmonary edema requiring only 1 dose of furosemide</td>
</tr>
<tr>
<td>Obstetric hemorrhage with return to operating room for any major procedure (excludes dilation)</td>
<td>Planned peripartum hysterectomy for cancer/neoplasia</td>
</tr>
<tr>
<td>Any emergency/unplanned peripartum hysterectomy, regardless of number of units transfused (includes all placenta accretas)</td>
<td></td>
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<tr>
<td>Obstetric hemorrhage with uterine artery embolization, regardless of number of units transfused</td>
<td></td>
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<tr>
<td>Obstetric hemorrhage with uterine balloon or uterine compression suture placed and 2–3 units of blood products transfused</td>
<td>Obstetric hemorrhage with uterine balloon or uterine compression suture placed and ≤1 unit of blood products transfused</td>
</tr>
<tr>
<td>Obstetric hemorrhage admitted to intensive care unit for invasive monitoring or treatment (either medication or procedure; not just observed overnight)</td>
<td>Any obstetric hemorrhage that went to the intensive care unit for observation only without further treatment</td>
</tr>
</tbody>
</table>
We know that there is a connection between co-morbidity and increased risk of morbidity and mortality.

How do we move forward with beginning to address these issues in our perinatal population?

RISK ASSESSMENT!
Data from US, France, & UK suggests that 40-50% of maternal deaths are potentially preventable.

Majority of deaths due to hemorrhage, hypertension, infection and VTE

Delays in recognition, diagnosis and treatment often precede an event.

Is it more difficult to assess and identify complications in the pregnant/postpartum woman?

How to facilitate timely diagnosis and treatment?
– Are there barriers
– What are the human factors
– What tools are available?
– Are there system problems?
To Err is Human: *Building a Safer Health System* was issued by the Institute of Medicine in September 1999.

- One of the report’s main conclusions was that the majority of medical errors do not result from individual recklessness or the actions of a particular group; but rather that errors are caused by faulty systems, processes, and conditions – or ‘correctable’ faults.

- In *Five Years After To Err is Human: What have we Learned* (JAMA, Vol. 293, No. 19, 2005), the clinical effectiveness of safe practices showed a dramatic decrease related to a number of interventions, including a 50% reduction in adverse outcomes of preterm deliveries from improved communication/ team training.
Risk reduction strategies
As required under the Sentinel Event Policy, based on their root cause analyses, organizations develop an action plan citing the steps they will take to reduce the risk of similar future adverse events. Some of the risk reduction strategies identified by these organizations include:

- Physician education and counseling (36 percent)
- Revise communication protocols (36 percent)
- Standardize equipment and drug availability (25 percent)
- Conduct team training (25 percent)
- Institute changes in the patient assessment policy (21 percent)
- Standardize the evaluation and monitoring process (21 percent)
- Adopt American Academy of Pediatrics (AAP), American College of Obstetricians and Gynecologists (ACOG) guidelines for perinatal care (3) (13 percent)
- Institute mock OB emergency training drills (11 percent)
“Three factors make patient safety and quality improvement in obstetrics an important topic:

1. Because obstetric admissions are the leading reason for hospitalizations in the United States, accounting for more than 4 million hospitalizations annually, the effects of obstetric quality improvement on the health care system as a whole are substantial;

2. Obstetrics is a unique health care setting because in an overwhelming majority of cases, the expectations of families are for a healthy and joyous outcome. Failure to meet these expectations because of mishaps or missed opportunities creates considerable disappointment from families and health care providers alike;

3. The medicolegal climate of obstetrics, with historically high rates of claims and monetary judgments against obstetricians, makes adverse outcomes economically costly to the system as well as emotionally costly to the parties involved.”

ACOG Committee Opinion number 629: Clinical Guidelines and Standardization of Practice to Improve Outcomes (2015)

- Protocols and checklists have been shown to reduce patient harm through improved standardization and communication.

- The use of checklists and protocols has been clearly demonstrated to improve outcomes and their use is strongly encouraged.

- Variation in processes of care is problematic because it may lead to increased rates of error.

- Performing critical tasks the same way every time can reduce the kind of errors that all human beings are subject to, especially when fatigue is a factor and in stressful environments such as the L&C suite and OR.
Key Priorities in Maternal Safety

- **Core Patient Safety Bundles**
  - OB Hemorrhage
  - Severe Hypertension in Pregnancy
  - Venous Thromboembolism Prevention in Pregnancy

- **Supplemental Patient Safety Bundles**
  - Maternal Early Warning Criteria
  - Facility Review
  - Family and Staff Support
BOI Quality and Safety Workgroup began exploring safety bundles:

- To endorse or recommend?
- Which bundles to focus on initially?
- What is our baseline in terms of a culture of safety in our SC delivering hospitals?
- How to package bundles?
- How to disseminate information?
# South Carolina Birth Outcomes Initiative – OB Safety Culture Assessment

## Culture of Safety

<table>
<thead>
<tr>
<th>Culture of Safety</th>
<th>Yes</th>
<th>No</th>
<th>In Process</th>
<th>Unfamiliar Term</th>
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<tbody>
<tr>
<td>Maternal Early Warning System (identification/treatment)</td>
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<tr>
<td>Pt, Family, Staff Support protocol after maternal event</td>
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<tr>
<td>Multidisciplinary review of severe maternal events, including patient perspective</td>
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<tr>
<td>Pts, families, &amp; staff encouraged to voice concerns</td>
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<td>Does your hospital institute the following:</td>
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<td>Daily safety rounds by leadership</td>
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<tr>
<td>Unit safety huddles for high-risk patients</td>
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<tr>
<td>Use of data for opportunities to improve safety</td>
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<tr>
<td>Safety drills for high-risk scenarios</td>
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<tr>
<td>Debrief after safety events or ‘near misses’</td>
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<tr>
<td>A patient safety office or safety nurse</td>
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<tr>
<td>Physicians’ involvement in planning QI projects</td>
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<tr>
<td>Root Cause Analysis (RCA) of safety events process</td>
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<tr>
<td>Policies, protocols, order sets to standardize care</td>
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<tr>
<td>Fetal monitoring education for nurses and physicians</td>
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<tr>
<td>Teamwork training program implementation</td>
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<tr>
<td>Monitor data metrics monthly to follow progress</td>
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</table>

**General Comments:**


**Barriers/How can BOI Help?:**


**Successes?:**


**Would you be willing to share or send tools/protocols from your facility?** Yes [ ] No [ ]
Culture of Safety - Response “Yes” or “In Process” – 30 responses

- Maternal Early Warning System (13)
- Pt/ Family/ Staff support protocol after mat event (10)
- Multidisciplinary review of severe mat events (22)
- Pt/ family/ staff encouraged to voice concerns (28)
- Daily safety rounds (26)
- Unit safety huddles for high-risk patients (20)
- Use of data to improve safety (29)
- Safety drills for high risk scenarios (28)
- Debrief after safety events (28)
- Patient safety officer/ nurse (22)
- MD involvement in QI events (21)
- RCAs of safety events (28)
- Policies/ protocols/ order sets for standardized care (30)
- Fetal monitoring education for MDs and nurses (27)
- Monitor data metrics to follow progress (27)
OB Hemorrhage Responses

OB Hemorrhage - Response “Yes” or “In Process” – 30 responses

- Risk Assessment (25)
- Hemorrhage Cart (26)
- Management Algorithm/ Table/ Tool (22)
- Massive Transfusion Protocol (24)
- Quantitative Blood Loss Mechanism (17)
Survey – HTN in Pregnancy

Hypertension (HTN) in Pregnancy

Severe HTN Checklist
Preeclampsia (PEC) Early Recognition Tool
PEC/Eclampsia Medication Tool
PEC/Eclampsia Management Table/Algorithm
PEC/Eclampsia in the ED Management Table/Algorithm
PEC Nursing Policy

General Comments:

Barriers/How can BOI Help?

Successes?

Would you be willing to share or send tools/protocols from your facility? Yes □ No □
Hypertension (HTN) in Pregnancy - Response “Yes” or “In Process” – 30 responses

- Severe HTN checklist (10)
- Preeclampsia Early Recognition Tool (9)
- Preeclampsia Medication Tool (16)
- Preeclampsia Management Algorithm (15)
- Preeclampsia in the ED Management Tool (5)
- Preeclampsia Nursing Policy (19)
Survey – Primary C/S

**Primary Cesarean Section – Promoting Vaginal Birth**

<table>
<thead>
<tr>
<th>Policies supporting spontaneous labor</th>
<th></th>
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<th></th>
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<tbody>
<tr>
<td>Revised Labor Curve utilized (Active ≥ 6 cm)</td>
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<tr>
<td>Doulas or Labor Support coaches encouraged</td>
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<tr>
<td>Induction Checklist utilized</td>
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<tr>
<td>Bishop’s Score documented for induction</td>
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<tr>
<td>Induction &lt;39 weeks only medical criteria</td>
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<tr>
<td>Induction/Augmentation of Labor Policy</td>
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<tr>
<td>Awareness of Facility’s Primary C-Section Rate</td>
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</tbody>
</table>

General Comments:

______________________________
______________________________
______________________________

Barriers/How can BOI Help?

______________________________
______________________________

Successes?

______________________________

Would you be willing to share or send tools/protocols from your facility? Yes □ No □
Primary C/S Responses

Primary Cesarean Section – Promoting Vaginal Birth - Response “Yes” or “In Process” – 30 responses

▪ Policies supporting spontaneous labor (18)
▪ Revised Labor Curve utilized - Active ≥ 6 cm (20)
▪ Doulas or Labor Support coaches encouraged (15)
▪ Induction Checklist utilized (15)
▪ Bishop’s Score documented for induction (16)
▪ Induction <39 weeks only medical criteria (14)
▪ Induction/Augmentation of Labor Policy (30)
▪ Awareness of Facility’s Primary C-Section Rate (29)
BOI OB Safety Bundles

https://www.scdhhs.gov/organizations/boi
Back to our Case Presentation

- Pregnancy Risk Factors
- Induction of Labor / Supporting Vaginal Birth → reduction of Cesarean births
- Recognition of Complications
- Response to Complications
Pregnancy Risk Factors?

- **Existing Health Conditions**
  - High blood pressure
  - Polycystic ovary syndrome
  - Diabetes
  - Kidney disease
  - Autoimmune disease
  - Thyroid disease
  - Infertility
  - Obesity
  - HIV/AIDS

- **Age**
  - Teen pregnancy
  - First-time pregnancy after age 35

- **Lifestyle Factors**
  - Alcohol use
    - Cigarette smoking

- **Conditions of Pregnancy**
  - Multiple gestation
  - Gestational diabetes

- **Risk of Fetal Genetic Disorder**
  - Older maternal age
  - Older paternal age
  - Parental carrier of chromosome rearrangement
  - Parental aneuploidy or aneuploidy mosaicism
  - Prior child with structural birth defect
  - Parental carrier of a genetic disorder
  - Previous fetus or child with autosomal trisomy or sex chromosome aneuploidy
  - Structural anomalies identified by ultrasonography

Early Obstetric Warning System

- Goal of early warning systems is to ensure timely recognition of patients developing acute illness
  - The early warning systems in use for non-Obstetric patients do not work well for Obstetric patients.

- We know abnormal physiologic signs and symptoms often precede critical illness

- In 2010 the Joint Commission issued a requirement for birth facilities to develop written criteria describing early warning signs indicating a change or deterioration in a patient’s condition and the requirement to promptly seek further assistance.

- In 2007, the United Kingdom recommended adoption of the Modified Early Obstetric Warning System

- Differences in the OB Warning system:
  - physiologic changes that occur during pregnancy
  - small number of conditions responsible for most maternal severe morbidity and mortality.

  “In this system, 2 moderately abnormal parameters (yellow alerts) or 1 severely abnormal parameter (red alert) triggers a clinical response to urgently assess the patient’s status and make a follow-up surveillance plan.”

Maternal Early Warning Trigger (MEWT) tool.

bil, bilirubin; BNP, brain natriuretic peptide; BP, blood pressure; CBC, complete blood count; CT, computed tomography; DBP, diastolic blood pressure; DIC, disseminated intravascular coagulation; EKG, electrocardiogram; g, grams; HR, hour; HR, heart rate; ICU, intensive care unit; LFTs, liver function testing; MAP, mean arterial pressure; MTP, maternal transfusion protocol; OB, obstetrician; O2 Sat, oxygen saturation; PH, preeclampsia laboratory assessment; Powerplan, electronic medical record preeclampsia order set; Pulse Ox, pulse oximetry; RR, respiratory rate; RRT, rapid response team; SBP, systolic blood pressure; Temp, temperature.

Maternal Early Warning Triggers
- HR > 110 bpm, MAP < 65 mm Hg, AMS, AT ≥ 38°C, RR > 24/min, SpO₂ < 94%

Sepsis Pathway
- Abnormal temperature + additional triggers
  - Sepsis
  - Severe sepsis or septic shock
  - Immediate physician assessment

Cardiopulmonary Pathway
- Normal temperature + additional triggers
  - Immediate physician assessment

Hypertension Pathway
- Elevated blood pressures + additional triggers
  - Immediate physician assessment

Hemorrhage Pathway
- Decreasing blood pressures + additional triggers
  - Immediate physician assessment

Fig. 1. Proposed algorithm based on two or more maternal early warning triggers persisting for 30 minutes or more. Abbreviations: HR, heart rate; bpm, beats per minute; MAP, mean arterial pressure; mm Hg, millimeters mercury; AMS, altered mental state; AT, abnormal temperature; RR, respiratory rate; SpO₂, oxygen saturation.
ACOG: Requirements for Triage Assessment

1. An individual or individuals determined qualified as designated by hospital policy must perform an appropriate medical screening examination to determine whether the patient has an emergency medical condition. This determination should take into account the health of the woman and the fetus.

2. If an emergency medical condition is determined to exist, stabilize the patient or transfer her if the obstetric care provider certifies that the benefits of transfer outweigh the risks. In the case of the latter, a written certification is required.

3. When necessary, arrange for transfer to another appropriate facility if the patient is stabilized or if the benefits of transfer outweigh the risks. Transfer should be carried out by qualified personnel and transportation equipment. Patients can decline transfer after being informed of the risks and benefits of transfer.

4. Appropriate medical screening cannot be delayed to inquire about payment method or insurance status.

ACOG Committee Opinion Number 667, July 2016. Hospital-Based Triage of Obstetric Patients
1. Implement institutional policies that uphold best practices in obstetrics, safely reduce routine intervention in low-risk women, and consistently support vaginal birth
2. Implement early labor supportive care polices and establish criteria for active labor admission
3. Improve the support infrastructure and supportive care during labor
4. Encourage the use of doulas and work collaboratively to provide labor support
5. Utilize best practice recommendations for laboring women with regional anesthesia
6. Implement intermittent monitoring policies for low-risk women
7. Implement current treatment and prevention guidelines for potentially modifiable conditions
Summary of Recommendations: Safe Prevention of Primary Cesarean Delivery – Adapted from ACOG/SMFM Obstetric Care Consensus Statement (2014)

1. In the first stage of labor
2. In the second stage of labor
3. Fetal surveillance
4. Induction of labor
5. Fetal malpresentation
6. Suspected macrosomia
7. Excessive maternal weight gain
8. Twin Gestations
9. Other
Let's use MFTI
What is plan?

**TABLE 2.1. Diagnostic Criteria for Preeclampsia**

**Blood pressure**
- Greater than or equal to 140 mm Hg systolic or greater than or equal to 90 mm Hg diastolic on two occasions at least 4 hours apart after 20 weeks of gestation in a woman with a previously normal blood pressure
- Greater than or equal to 160 mm Hg systolic or greater than or equal to 110 mm Hg diastolic, hypertension can be confirmed within a short interval (minutes) to facilitate timely antihypertensive therapy

**Proteinuria**
- Greater than or equal to 300 mg per 24 hour urine collection (or this amount extrapolated from a timed collection)
- Protein/creatinine ratio greater than or equal to 0.3
- Dipstick reading of 1+ (used only if other quantitative methods not available)

Or in the absence of proteinuria, new-onset hypertension with the new onset of any of the following:
- Thrombocytopenia: Platelet count less than 100,000/microliter
- Renal insufficiency: Serum creatinine concentrations greater than 1.1 mg/dL or a doubling of the serum creatinine concentration in the absence of other renal disease
- Impaired liver function: Elevated blood concentrations of liver transaminases to twice normal concentration
- Pulmonary edema
- Cerebral or visual symptoms

* Each measured as mg/dL.
### Hemorrhage Guidelines: Staged Responses

<table>
<thead>
<tr>
<th>Stage 0: All birth - Routine Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Admission:</strong> All patients - Assess Risk</td>
</tr>
</tbody>
</table>

| Stage 1: QBL > 500 mL vag or 1000 mL CS or VS unstable with continued bleeding |

| Stage 2: QBL 1000-1500 mL with continued bleeding |

| Stage 3: QBL exceeds 1500 mL |

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### California OB Hemorrhage Guidelines

- **Stage 0** (BE PREPARED)
  - Risk assessment on admission
  - Active management 3rd stage of labor
  - Antepartum care and counseling
    - Previa, accreta, Jehovah's witness, iron deficiency anemia
  - Appropriate blood bank specimens on admission
  - **Quantify** blood loss for all births
California OB Hemorrhage Guidelines

**Stage 1:** EBL > 500 mL (vaginal) or > 1000 mL (C/S) or HR > 110, BP <85/45, O2 sat <95%; AND STILL BLEEDING
- Activate hemorrhage protocol and check list
- Find cause
  - Use a standard second line medication for atony
- Initiate preparations
  - Get help: BUT primary RN STAY AT BEDSIDE
  - IV 16 gauge and baseline labs
  - Foley with urimeter
  - Blood bank: T and C 2 units
  - Quantify blood loss

---

### STAGE 2: OB Hemorrhage

**MOBILIZE**

<table>
<thead>
<tr>
<th>Primary nurse (or charge nurse):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call obstetrician or midwife to bedside</td>
</tr>
<tr>
<td>Call Antenatalistologist</td>
</tr>
<tr>
<td>Activate Response Team</td>
</tr>
<tr>
<td>PHONE #</td>
</tr>
<tr>
<td>Notify Blood bank of hemorrhage; order products as directed</td>
</tr>
</tbody>
</table>

**Charge nurse:**
- Notify Perinatologist or 2nd OB
- Bring hemorrhage cart to the patient's location
- Initiate OB Hemorrhage Record
- If consulting direct embolization call Interventional Radiology Team and second anesthesiologist
- Notify nursing supervisor
- Assign single person to communicate with blood bank
- Assign second anesthetist or clinical nurse specialist as family support person or call medical social worker

**Team leader (OB physician or midwife):**
- Additional uterine medication: Hysteract 250 mg IM (if not contraindicated) or Misoprostol 800 mg SL
- Can repeat Hysteract up to 3 times every 20 min
- (note: 75% respond to first dose)
- Continue IV suction and provide additional IV crystalloid solution

- Do not delay other interventions (see right column) while waiting for response to medications
  - Unilateral uterine massage
  - Move to OR (if a postpartum unit, move to L&D or OR)
  - Order 2 units PRBCs and bring to the bedside
  - Order labs STAT (CBC, PIH, Chem 12 panel, Coag Panel II, ABO)
  - Transfuse PRBCs based on clinical signs and response, do not wait for lab results; consider immediate emergency O-negative transfusion

**Primary nurse (or designated):**
- Establish 2nd large bore IV, at least 10 gauge
- Assess and announce Vital Signs and cumulative blood loss q 5-10 minutes
- Set up blood administration set and blood warmer for transfusion
- Administer meds, blood products and drugs, as ordered
- Keep patient warm

**Secondary nurse (or charge nurse):**
- Place Foley with urimeter (if not already done)
- Obtain portable light and OB procedure tray or Hemorrhage cart
- Obtain blood products from the Blood Bank (or send designee)
- Assist with move to OR (if indicated)

**Blood Bank:**
- Determine availability of thawed plasma, fresh frozen plasma, and platelets. Initiate delivery of platelets if not present on-site
- Consider thawing 2-4 FFP (takes 30 min), use if transfusing > 2 units PRBCs
- Prepare for possibility of massive hemorrhage

**ACT**

- Sequelectively advance through procedures and other interventions based on etiology:
  - Vaginal birth
    - If trauma (vaginal, cervical or uterine):
      - Visualize and repair
      - Retained placenta:
        - D&C
        - If uterine atony or lower uterine segment bleeding:
          - Intravenous Balloon
          - Above measures unproductive:
            - Selective embolization (Interventional Radiology if available & adequate experience)
  - Caesarean:
    - B-Lynch Suturing
    - Intravenous Balloon
  - Upper Inversion:
    - Anesthesia and uterine relaxation drugs for manual reduction
  - Renal Fluid Embolism:
    - Maximally aggressive respiratory vasopressor and blood product support

**THINK**

- If vital signs are worse than estimated or measured blood loss; possible uterine rupture or broad ligament tear with internal bleeding; move to laparotomy
- Once stabilized: Modified Postpartum management with increased surveillance
California OB Hemorrhage Guidelines

Stage 3: **STILL BLEEDING** and EBL >1500 mL or
> 2 u PRBCs given or VS unstable or suspect coagulopathy

- Massive transfusion protocol
  - Transfuse aggressively
  - Near 1:1 ratio PRBC: FFP
  - Rapid use of FFP may be as important as ratio
  - 1 PLTpheresis pack per 4-6 units PRBC

- Invasive surgical techniques
- Mobilize help: Advanced surgeon (gyn, gyn onc, trauma, MFM)
Identify barriers to and options for implementation of OB safety bundles in his/her respective institution.
Barriers identified through survey comments:

- Time consuming to develop a formal, standardized process
- Physician buy-in
- Limitations or problems with EMR
- Lack of consistency among providers/ Tools in place but not used
Recognize the potential role of South Carolina in the Alliance for Innovation on Maternal Health (AIM) program
What is AIM?

- ACOG
- Council for Patient Safety in Women’s Health Care
- Funded by Maternal Child Health Bureau
- Founded 2014
Who else participates?

- American College of Nurse Midwives (ACNM),
- Association of Maternal and Child Health Programs (AMCHP),
- Association of State and Territorial Health Officials (ASTHO),
- Association of Women’s Health, Obstetric, and Neonatal Nurses (AWHONN),
- California Maternal Quality Care Collaborative (CMQCC),
- Society for Maternal-Fetal Medicine (SMFM),
What are the Goals?

- The purpose of the AIM program is to equip, empower and embolden every state, perinatal quality collaborative, hospital network/system, birth facility and maternity care provider in the U.S to significantly reduce severe maternal morbidity and maternal mortality through proven implementation of consistent maternity care practices that are outlined in maternal safety bundles (action systems).

- Obstetrical Hemorrhage
- Severe Hypertension/Preeclampsia
- Prevention of Venous Thromboembolism
- Reduction of Low Risk Primary Cesarean Births/Support for Intended Vaginal Birth
- Reduction of Peripartum Racial Disparities
- Postpartum care access and standards
Things are changing...

- Original goals were:
  - 8 states
  - 1000 deaths prevented
  - 100,000 near misses
  - 4 years

- Already expanded set of goals
Current States

- Oklahoma
- Maryland
- Louisiana
- Michigan
- Florida
- Illinois
- NC
- Mississippi
- NJ
- Utah
Why is SC a good fit?

- Bad outcomes
- Infrastructure in place; BOI
- No bundle program in place
- ACOG offer on the table
Pros/Cons

- **Pros**
  - Proven
  - Standardized
  - Assistance available
  - Similar to other participants
  - We don’t have a plan

- **Cons**
  - Top down
  - “We’re already doing it”
  - Cost
  - Ownership
  - Long term plan
Reminder – It works!

Maternal Mortality Rate, California and United States; 1999-2013

Proposal on Table

- Utilize an AIM staff person currently working on ACOG project for overseas
- 60 %
- Apply in 2017, educate and organize
- Late 2017, 2018 – Start w hemorrhage, move to CV
- 2018-19 Data, re-evaluate.
Thank you for your time!

Any questions?