New Updates on Maternal Safety Bundles
Chad Michael Smith, MD, FACOG

- OB Hospitalist, Mercy Hospital OKC
- Medical Director, OPQIC
- Chief Medical Office, Mercy Hospital OKC
Today’s Roadmap

• Maternal Safety Bundles
  • Postpartum Hemorrhage
  • Hypertensive Disorders of Pregnancy
• Sepsis
Post Partum Hemorrhage

Special Thanks to CMQCC
Summary of Updates

• Risk Factor Assessment
• Using Triggers to Define, Recognize, and Respond
• Quantitative, Cumulative Blood Loss Best Practices
• Medications for Prevention and Treatment
• Blood Product Replacement
• Integration of Birth Equity
New Sections

• Implementing and Sustaining Quality, Safety, and PI
• Leveraging Electronic Health Records
• Management of Iron Deficiency Anemia
• Secondary OB Hemorrhage and Readmission
• Using Outcome Metrics for QI Projects
QI/PI & Safety Pearls

• Avoid “One-Size Fits All” Thinking
• Continuous and Adaptive Process
• Use What You Have AND
• Identify What You Need
• Develop Data Monitoring
• Communicate, Communicate, Communicate
Joint Commission Standards for Maternal Safety

- Complete an assessment using an evidence-based tool for determining maternal hemorrhage risk on admission to L&D and on admission to postpartum.

- Develop written evidence-based procedures for managing pregnant and postpartum patients who experience maternal hemorrhage.

Joint Commission Standards for Maternal Safety

• Each OB unit has a standardized, secured, and dedicated hemorrhage supply kit that must be stocked per the hospital’s defined process.

• Provide role-specific education to all staff and providers who treat pregnant/postpartum patients about the hospital’s hemorrhage procedure

Joint Commission Standards for Maternal Safety

• Conduct drills (with a debrief) at least annually to determine system issues as part of ongoing quality improvement efforts.

• Review severe hemorrhage cases that meet criteria established by the hospital to evaluate the effectiveness of the care, treatment, and services provided during the event.

• Provide printed education to patients.

Ongoing Risk Factor Assessment

• Prenatal
• Intrapartum
• Start of Second Stage
• Upon Transfer to Postpartum
• Any Change in Patient Condition

• Up to 40% of patients who experience PPH have no identifiable risk factors

Prenatal Considerations

• Iron Deficiency Anemia
  • Modifiable Contributor

• Inherited Coagulation Disorders

• Declination of Blood Products
  • Optimize prenatally
  • Plan for delivery accordingly

• Placenta Accreta Spectrum (PAS)
Iron Deficiency Anemia

• Prevalent in pregnant patients and disproportionately affects Black and Hispanic women

• Care should focus on engaging the patient in treatment goals

• Provider detailed information about how to take medications is critical

• 1\textsuperscript{st} line therapy is oral ferrous iron compounds

• 2\textsuperscript{nd} line therapy is intravenous iron (1\textsuperscript{st} line when rapid repletion is indicated)
When Patients Don’t Prefer Blood

- Assess patient beliefs in advance of labor/planned surgery
- Facilitate care coordination and preparation for alternative interventions
- Prenatal optimization of hemoglobin
<table>
<thead>
<tr>
<th>ADMISSION &amp; LABOR RISK FACTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LOW RISK</strong></td>
</tr>
<tr>
<td><strong>MONITOR FOR HEMORRHAGE</strong></td>
</tr>
<tr>
<td><em>Routine obstetric care</em></td>
</tr>
<tr>
<td><strong>MEDIUM RISK</strong></td>
</tr>
<tr>
<td><strong>NOTIFY CARE TEAM</strong></td>
</tr>
<tr>
<td><em>Personnel that could be</em></td>
</tr>
<tr>
<td><em>involved in response are made</em></td>
</tr>
<tr>
<td><em>aware of patient status and</em></td>
</tr>
<tr>
<td><em>risk factors</em></td>
</tr>
<tr>
<td><strong>HIGH RISK</strong></td>
</tr>
<tr>
<td><strong>NOTIFY CARE TEAM</strong></td>
</tr>
<tr>
<td><strong>MOBILIZE RESOURCES</strong></td>
</tr>
<tr>
<td><em>Consider anesthesia attendance</em></td>
</tr>
<tr>
<td><em>at delivery</em></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Specimen on hold in blood bank</strong></th>
<th><strong>Type and screen</strong></th>
<th><strong>Type and cross, 2 units on hold</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>No previous uterine incision</td>
<td>Prior cesarean birth(s) or uterine surgery</td>
<td>Placenta previa, low lying placenta</td>
</tr>
<tr>
<td>Singleton pregnancy</td>
<td>Multiple gestation</td>
<td>Suspected/known placenta accreta spectrum</td>
</tr>
<tr>
<td>≤ 4 vaginal births</td>
<td>&gt; 4 vaginal births</td>
<td>Abruptio or active bleeding (greater than show)</td>
</tr>
<tr>
<td>No known bleeding disorder</td>
<td>Chorioamnionitis</td>
<td>Known coagulopathy</td>
</tr>
<tr>
<td>No history of PPH</td>
<td>History of previous postpartum hemorrhage</td>
<td>History of &gt; 1 prior postpartum hemorrhage</td>
</tr>
<tr>
<td>Large uterine fibroids</td>
<td>HELLP Syndrome</td>
<td></td>
</tr>
<tr>
<td>Platelets 50-100,000</td>
<td>Platelets &lt; 50,000</td>
<td></td>
</tr>
<tr>
<td>Hematocrit &lt; 30% (Hgb &lt; 10)</td>
<td>Hematocrit &lt; 24% (Hgb &lt; 8)</td>
<td></td>
</tr>
<tr>
<td>Polyhydramnios</td>
<td>Fetal demise</td>
<td></td>
</tr>
<tr>
<td>Gestational age &lt; 37 weeks or &gt; 41 weeks</td>
<td>2 or more medium risk factors</td>
<td></td>
</tr>
<tr>
<td>Preeclampsia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prolonged labor/Induction (&gt; 24 hours)</td>
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</tr>
</tbody>
</table>

Risk factors shaded in gray have been added since the last version in 2015.
*TJC requires that an assessment using an evidence-based tool for determining maternal hemorrhage risk be completed on admission to labor and delivery and on transfer to postpartum.*

<table>
<thead>
<tr>
<th>ROUTINE CARE</th>
<th>INCREASED SURVEILLANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cesarean birth during this admission – <em>especially if urgent/emergent/2(^{nd}) stage</em></td>
<td>Active bleeding soaking &gt; 1 pad per hour or passing a ≥ 6 cm clot</td>
</tr>
<tr>
<td>Operative vaginal delivery</td>
<td>Retained placenta</td>
</tr>
<tr>
<td>Genital tract trauma including 3(^{rd}) &amp; 4(^{th}) degree lacerations</td>
<td>Non-lower transverse uterine incision for cesarean birth</td>
</tr>
<tr>
<td>Quantitative cumulative blood loss 500-1000 mL with a vaginal delivery</td>
<td>Quantitative cumulative blood loss ≥ 1000 mL or treated for hemorrhage</td>
</tr>
<tr>
<td>Received general anesthesia</td>
<td>Uterine rupture</td>
</tr>
</tbody>
</table>
Quantitative Blood Loss

• Delay in diagnosis remains the most significant factor in patients being at higher risk of severe morbidity

• Routine use is integral to build a shared mental model
  • Avoids confusion and builds expertise
  • Emphasizes importance of interdisciplinary communication

• Underestimation is common

• Document input/output and communicate regularly during active bleeding and in the first 4-6 hours after arrest of bleeding

Quantitative Blood Loss in Obstetric Hemorrhage

ABSTRACT: Postpartum hemorrhage causes approximately 11% of maternal deaths in the United States and is the leading cause of death that occurs on the day of birth. Importantly, 54–93% of maternal deaths due to obstetric hemorrhage may be preventable. Studies that have evaluated factors associated with identification and treatment of postpartum hemorrhage have found that imprecise health care provider estimation of actual blood loss during birth and the immediate postpartum period is a leading cause of delayed response to hemorrhage. Although current data do not support any one method of quantifying blood loss as superior to another, quantification of blood loss, such as using graduated drapes or weighing, provides a more accurate assessment of actual blood loss than visual estimation; however, the effectiveness of quantitative blood loss measurement on clinical outcomes has not been demonstrated. Successful obstetric hemorrhage bundle implementation is associated with improved outcome measures related to obstetric hemorrhage. However, further research is necessary to better evaluate the particular effect of quantitative blood loss measurement in reducing maternal hemorrhage-associated morbidity in the United States.
Clinical Pearl

Cumulative blood Loss (CBL) should not be used in isolation to confirm or rule out obstetric hemorrhage.

It is one parameter of many that should be given equal emphasis as key changes occur in vital signs over time (↑ HR, ↓ BP, ↓ urine output) and alterations in key hematological and biochemical indices.

Patient or family concerns should be part of the criteria to identify concealed hemorrhage.
Medication Management

• Oxytocin is the medication of choice for prophylaxis AND treatment of postpartum hemorrhage

• 2nd line uterotonics for treatment of refractory uterine atony included Methergine® or Hemabate®

• Prenatal optimization of hemoglobin

• Misoprostil no longer recommended for routine use
Hypertensive Disorders of Pregnancy

Special Thanks to CMQCC
Summary of Updates

• Expanded Scope
• Alignment with ACOG Definition
• Low-dose Aspirin
• Long Term Follow Up
Outdated Terminology

• Severe or Mild Preeclampsia

• Toxemia

• Pregnancy-induced Hypertension

• Atypical Preeclampsia
Guidelines for Management

1. Recognize symptoms and diagnose HDP
2. Blood pressure control
3. Seizure prevention
4. Delivery
   - 34 weeks – preeclampsia with severe features
   - 37 weeks – preeclampsia without severe features or gestational hypertension
5. Postpartum surveillance
Risk Factors for Preeclampsia

- Prior History
- Multifetal Gestations
- Chronic Hypertension
- Pregestational Diabetes
- Systemic Lupus Erythematosus
- Obstructive Sleep Apnea
- Nulliparity
- Gestational Diabetes
- Pre-pregnancy BMI >30
- Antiphospholipid Antibody Syndrome
- Maternal Age 35+ Years
- Thrombophilia
- Assisted Reproductive Technology

Gestational Hypertension and Preeclampsia, ACOG Practice Bulletin #222, 2020
Equity and Targeting Racial Disparities

• Foster individual, organizational and professional accountability

• Ensure the patient, family and clinicians caring are well supported especially in the face of biases

• Hospital leaders should demonstrate an openness to feedback and reporting of concerns

• Leaders need to make equity and targeting racial disparities their top priorities for quality improvement and ensure that clinicians are trained on implicit bias and interpersonal, institutional and systemic racism
Accurate Blood Pressure Measurement

• Accurate blood pressure (BP) measurement is essential to guide management decisions in order to avoid over- or under-treatment leading to adverse outcomes.

• Minimize factors that decrease the accuracy of BP measurements, and be consistent: same arm, same position, and correct cuff size.

• A severe-range BP obtained with an automated BP device should be validated with a manual measurement for accuracy.

• Evaluate BP trends vs. isolated values.

<table>
<thead>
<tr>
<th>Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Prepare equipment</td>
</tr>
<tr>
<td>2. Prepare the patient</td>
</tr>
<tr>
<td>3. Take measurement</td>
</tr>
<tr>
<td>4. Record measurement</td>
</tr>
</tbody>
</table>
## Quality Improvement Opportunities to Improve Recognition of HDP


### Recognition: Missed Symptoms or Misdiagnosed

<table>
<thead>
<tr>
<th>Missed Symptoms: (didn't see it)</th>
<th>Misdiagnosed: (saw it as something else)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache</td>
<td>Seizure disorder</td>
</tr>
<tr>
<td>Elevated blood pressures</td>
<td>Gallstones</td>
</tr>
<tr>
<td>Abnormal fetal heart rate tracings</td>
<td>Chronic hypertension</td>
</tr>
<tr>
<td>Blurred vision</td>
<td>New onset asthma</td>
</tr>
<tr>
<td>Low oxygen saturation</td>
<td>Postpartum psychosis</td>
</tr>
<tr>
<td>Severe pain, epigastric pain, chest pain</td>
<td></td>
</tr>
<tr>
<td>Altered behavior (confusion, combative)</td>
<td></td>
</tr>
<tr>
<td>Tea colored urine, oliguria</td>
<td></td>
</tr>
<tr>
<td>Bleeding, anemia, coagulopathy</td>
<td></td>
</tr>
<tr>
<td>Cough, wheezing, shortness of breath</td>
<td></td>
</tr>
<tr>
<td>Proteinuria</td>
<td></td>
</tr>
<tr>
<td>Abnormal lab values</td>
<td></td>
</tr>
</tbody>
</table>
**Sustained BP**

≥ 160 systolic OR ≥ 110 diastolic

**Initiate Hypertension in Pregnancy Protocol:**

Treat blood pressure with antihypertensive therapy within 1 hour and

Treat with Magnesium Sulfate – 4-6** gm bolus, followed by maintenance dose 1-2 gm per hour based upon renal status

**Use 6 gm if BMI > 35**

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### Physiological Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>(Yellow) Triggers (Two or more)</th>
<th>(Red) Triggers (One or more)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic BP, mm Hg (repeat in 15 min)</td>
<td>&lt; 90 or &gt; 155* – 159</td>
<td>≥ 160</td>
</tr>
<tr>
<td>Diastolic BP, mm Hg (repeat in 15 min)</td>
<td>105* - 109</td>
<td>≥ 110</td>
</tr>
<tr>
<td>Mean Arterial Pressure: mm Hg</td>
<td>&lt; 65 or &gt; 110</td>
<td>&lt; 55 or &gt; 120</td>
</tr>
<tr>
<td>Heart Rate: beats per min</td>
<td>&lt; 50 or 110-120</td>
<td>&gt; 120</td>
</tr>
<tr>
<td>Respiratory Rate: breaths per min</td>
<td>&lt; 12 or 25-30</td>
<td>&gt; 30</td>
</tr>
<tr>
<td>Oxygen Saturation: % on room air</td>
<td>&lt; 95</td>
<td>&lt; 93</td>
</tr>
<tr>
<td>Oliguria: ml/hr for ≥ 2 hours</td>
<td>35-49</td>
<td>&lt; 35</td>
</tr>
</tbody>
</table>

### Severe (Red) triggers

- Altered mental status: Maternal agitation, confusion or unresponsiveness
- Neurologic: Unrelenting, severe headache unresponsive to medication
- Visual Disturbances: Blurred or impaired vision
- Physical: Shortness of breath or epigastric pain

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**If "Yellow" or "Red" BP Triggers, recheck BP within 15 minutes**

*Lowering the threshold for treatment should be considered at systolic BP of 155 mm Hg or diastolic BP of 105 mm Hg. See Borderline Severe-range Blood Pressures Section*

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### Abnormal Maternal Assessment

If sustained for **15 minutes** OR

If the nurse is clinically concerned with patient status

**REQUEST PROVIDER EVALUATION**

Sustained BP ≥ 160 systolic OR ≥ 110 diastolic

Initiate Hypertension in Pregnancy Protocol:

Treat blood pressure with antihypertensive therapy within 1 hour *and*

Treat with Magnesium Sulfate – 4-6** gm bolus, followed by maintenance dose 1-2 gm per hour based upon renal status

**Use 6 gm if BMI > 35**

**IF O2 Sat < 93% or RR > 24**

**CONSIDER PULMONARY EDEMA**
Forty percent of patients with new-onset hypertension or new-onset proteinuria will develop preeclampsia.

Hypertensive Emergency in Pregnancy/Postpartum

<table>
<thead>
<tr>
<th>Systolic</th>
<th>Diastolic</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 160</td>
<td>≥ 110</td>
<td>Repeat BP within 15 minutes. If BP remains within severe-range - treat within 30-60 minutes (ideally ASAP).</td>
</tr>
</tbody>
</table>

DO NOT WAIT TO TREAT THE HYPERTENSIVE EMERGENCY

ACOG Practice Bulletin #222, June 2020
Acute Treatment Algorithm

Evaluation and Treatment of Antepartum and Postpartum Preeclampsia/Eclampsia

Part 2: Antihypertensive Treatment Algorithm for Hypertensive Emergencies

Target BP: 130-150/80-100 mm Hg

Once BP threshold is achieved:
- Q10 min for 1 hr
- Q15 min for 1 hr
- Q30 min for 1 hr
- Q1hr for 4 hrs

*Intravenous hydralazine or labetalol should be given over 2 minutes. In the presence of sinus bradycardia or a history of asthma, hydralazine or nifedipine are preferred as initial agents. If maternal HR > 110, labetalol is preferred.

ACOG Practice Bulletin 203, 2019
Clinical Pearl

In patients with preterm preeclampsia (< 34 weeks) with severe features, the disease can rapidly progress to significant maternal morbidity and/or mortality.
Low-Dose Aspirin

- Effective mechanism for the prevention of preeclampsia in high-risk patients (mainly those with a prior history)
- Anti-inflammatory, anti-angiogenesis, anti-platelet
- 81 mg/day recommended for high-risk patients
- Initiate between 12-28 weeks (optimally prior to 16 weeks) and continue until delivery
- Recommended by ACOG and the USPSTF
Clinical Pearl

At the time of discharge, women and families should be given clear written educational materials outlining signs and symptoms to alert them when they need further assessment requiring return to their provider’s office or the hospital.

*Home blood pressure monitoring by the patient should be encouraged whenever possible.*
Late Postpartum Eclampsia

- > 48 hours following delivery, up to 6 weeks PP
- Approximately 26% of cases of eclampsia
- 78% had no antepartum hypertensive diagnosis
- The magnitude of blood pressure elevation does not appear to be predictive of eclampsia
- The most common presenting symptom was headache
  - ~ 70% of patients
  - Other prodromal symptoms included shortness of breath, blurred vision, nausea, vomiting, edema, neurological deficit, and epigastric pain

Clinical Pearl

Postpartum women who present to the emergency department and have “trigger or critical hypertension” or suspected preeclampsia should be assessed by and/or admitted to obstetrical service.
Preeclampsia in the ED

• Identify whether the patient is or has been pregnant in the last six weeks (MOST CRITICAL)

• Immediately assess all affirmative responses

• ED and OB clinicians should be notified with expectation of expedited evaluation and management
Long-Term Risks for Patients

• Increased risk for pulmonary edema and cardiomyopathy
• Patients with low oxygen saturation, shortness of breath, or dyspnea should be evaluated and treated
• Patients should be counseled regarding increased risk of future cardiovascular disease
• Primary care providers should be informed
Talking to Patients and Their Family

• Educated about how to identify early warning signs and when to seek medical care
• Acknowledge the impact on general and mental health to promote effective communication and education
• Talk mindfully regarding the variety of emotional states, education levels, health literacy, cultural practices and languages spoken
• Rely on evidence-based communication protocols to ensure patient-centered care, promote shared decision-making and embrace the diversity of family structures and cultural practices
Sepsis

Improving Diagnosis and Treatment of Maternal Sepsis
Errata 7/1/2022 | California Maternal Quality Care Collaborative (cmqcc.org)
THANK YOU FOR YOUR PARTICIPATION!