Safety Action Series

Severe Hypertension
Patient Safety Bundle
Speakers

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Disclosures

- Peter Bernstein, MD, MPH, FACOG has no real or perceived conflicts of interest to disclose.

- Jennifer Frost, MD, FAAFP has no real or perceived conflicts of interest to disclose.
Objectives

- Provide an in-depth overview of the Hypertension Patient Safety Bundle.
- Take a look at the processes, methods, and tools that were used to develop the bundle.
- Give suggestions for how to effectively implement and utilize the bundle within your organization.
- Identify resources to customize for use within your organization.
## Maternal Mortality and Severe Morbidity

Approximate distributions, compiled from multiple studies

<table>
<thead>
<tr>
<th>Cause</th>
<th>Mortality (1-2 per 10,000)</th>
<th>ICU Admit (1-2 per 1,000)</th>
<th>Severe Morbid (1-2 per 100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTE and AFE</td>
<td>15%</td>
<td>5%</td>
<td>2%</td>
</tr>
<tr>
<td>Infection</td>
<td>10%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>15%</td>
<td>30%</td>
<td>45%</td>
</tr>
<tr>
<td><strong>Preeclampsia</strong></td>
<td><strong>15%</strong></td>
<td><strong>30%</strong></td>
<td><strong>30%</strong></td>
</tr>
<tr>
<td>Cardiac Disease</td>
<td>25%</td>
<td>20%</td>
<td>10%</td>
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</tbody>
</table>
Hypertension Perspective

- Hypertensive disorders in pregnancy are common complications that affect 5% to 10% of all pregnancies in the United States. 3

- Preeclampsia is the leading case of maternal and perinatal morbidity and mortality, with an estimated 50,000 – 60,000 preeclampsia-related deaths per year worldwide. 2,4

- For every preeclampsia-related death that occurs in the United States, there are probably 50-100 other women who experience “near miss” significant maternal morbidity that stops short of death but still results in significant health risk and health care costs. 1,3

Dominance of Provider QI Opportunities: Hemorrhage and Preeclampsia

- California Pregnancy Associated Mortality Reviews
  - Missed triggers/risk factors: abnormal vital signs, pain, altered mental status/lack of planning for at risk patients
  - Underutilization of key medications and treatments
  - Difficulties getting physician to the bedside
  - “Location of care” issues involving Postpartum, ED and PACU

  Present in >95% of cases

- University of Illinois Regional Perinatal Network
  - Failure to identify high-risk status
  - Incomplete or inappropriate management

  Present in >90% of cases

Background - Building Consensus

- ACOG-CDC Maternal Mortality/Severe Morbidity Action Meeting occurred in Atlanta - November 2012
- Participants identified key priorities:

<table>
<thead>
<tr>
<th>Core Patient Safety Bundles</th>
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<tbody>
<tr>
<td>Obstetric Hemorrhage</td>
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<tr>
<td><strong>Severe Hypertension in Pregnancy</strong></td>
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<tr>
<td>Venous Thromboembolism Prevention in Pregnancy</td>
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<table>
<thead>
<tr>
<th>Supplemental Patient Safety Bundles</th>
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<tbody>
<tr>
<td>Maternal Early Warning Criteria</td>
</tr>
<tr>
<td>Facility Review</td>
</tr>
<tr>
<td>Family and Staff Support</td>
</tr>
</tbody>
</table>

- 6 multidisciplinary working groups were formed
Severe Hypertension Bundle Workgroup

- John Barton, MD, MPH – ACOG Hypertension Taskforce
- Peter Bernstein, MD, MPH – ACOG District II (NY)
- Maurice Druzin, MD, MPH – ACOG Hypertension Taskforce, CMQCC
- Jennifer Frost, MD, MPH – AAFP
- James Martin, MD – ACOG Hypertension Taskforce
- Kate Menard, MD, MPH – University of North Carolina, Chapel Hill
- Christine Morton, PhD – CMQCC-MERCK
- Linda Polley, MD – SOAP
- Catherine Ruhl, CNM, MS – AWHONN
- George Saade, MD – University of Texas
- Larry Shields, MD – Trinity Health
- Joanie Slager, DNP, CNM – ACNM
- Eleni Tsigas – Preeclampsia Foundation
National Partnership for Maternal Safety: Confluence of Multiple Efforts-May 2013 ACOG Annual Clinical Meeting

- CDC / ACOG Maternal Mortality Work Group
- SMFM--M back into MFM Work Group
- AWHONN: Safety Projects
- State Quality Collaboratives
- Merck for Mothers
- Maternal Child Health Branch—M back into MCH
- CDC: Maternal Mortality Reviews and Maternal Morbidity Projects
Current Commentary

The National Partnership for Maternal Safety

Mary E. D’Alton, MD, Elliott K. Main, MD, M. Kathryn Menard, MD, and Barbara S. Levy, MD

Recognition of the need to reduce maternal mortality and morbidity in the United States has led to the creation of the National Partnership for Maternal Safety. This collaborative, broad-based initiative will begin with three priority bundles for the most common preventable causes of maternal death and severe morbidity: obstetric hemorrhage, severe hypertension in pregnancy, and peripartum venous thromboembolism. In addition, three unit-improvement bundles for obstetric services were identified: a structured approach for the recognition of early warning signs and symptoms, structured internal case reviews to identify systems improvement opportunities, and support tools for patients, families, and staff that experience an adverse outcome. This article details the formation of the National Partnership for Maternal Safety and introduces the initial priorities.

(Obstet Gynecol 2014;123:973–7)
DOI: 10.1097/AOG.0000000000000219

issued a Sentinel Alert entitled “Preventing Maternal Death” and proposed various initiatives to decrease maternal mortality including case reporting and review, health care provider education, team training and drills, and thromboembolism prophylaxis.

During the past 2 years, several organizations—including the American College of Obstetricians and Gynecologists (the College), the Centers for Disease Control and Prevention, the Society for Maternal-Fetal Medicine, the Health Resources and Services Administration, the Association of Women’s Health, Obstetric, and Neonatal Nurses, and the American College of Nurse-Midwives—have collaborated to identify priorities for maternal safety. Universal recognition of the need for action to reduce U.S. maternal mortality and morbidity led to the creation of the National Partnership for Maternal Safety. This report outlines a national initiative for every birthing facility.
Maternal Safety

Direct Providers

- Obstetricians (ACOG/SMFM/ACOOG)
- Nurses (AWHONN)
- Midwives (ACNM)
- Family Medicine (AAFP)
- OB Anesthesia (SOAP)
- Blood Banks (AABC)
- Hospitals (AHA, VHA)
- Birthing Centers (AABC)
- Nurse Practitioners (NPWH)
- Safety, Credentials (TJC)

Federal (MCH-B, CDC, CMS/CMMI)

State (AMCHP, ASTHO, MCH)

Perinatal Quality Collaboratives (many)

Blood Banks (AABC)

COUNCIL ON PATIENT SAFETY IN WOMEN'S HEALTH CARE

safe health care for every woman
Council on Patient Safety: July 2013
Endorsed the concept: 3 Maternal Safety Bundles

“What every birthing facility in the US should have...”

The bundles represent outlines of recommended protocols and materials important to safe care **BUT** the specific contents and protocols should be individualized to meet local capabilities.

Hypertension Bundle details were endorsed by the Council in January 2015
4 Domains of Patient Safety Bundles

Readiness
Recognition & Prevention
Response
Reporting & Systems Learning
Goals

• Improve **readiness** to severe hypertension in pregnancy by identifying standard protocols on every unit.

• Improve **recognition** of severe hypertension in pregnancy by prompt response to early maternal warning signs.

• Improve **response** to severe hypertension in pregnancy with facility wide standards for management and treatment of severe hypertension and eclampsia.

• Improve **reporting/systems learning** of severe hypertension in pregnancy by establishing a culture of huddles and debriefs.
**READINESS**

Every Unit
- Standards for early warning signs, diagnostic criteria, monitoring and treatment of severe preeclampsia/eclampsia (include order sets and algorithms)
- Unit education on protocols, unit-based drills (with post-drill debriefs)
- Process for timely triage and evaluation of pregnant and postpartum women with hypertension including ED and outpatient areas
- Rapid access to medications used for severe hypertension/eclampsia: Medications should be stocked and immediately available on L&D and in other areas where patients may be treated. Include brief guide for administration and dosage.
- System plan for escalation, obtaining appropriate consultation, and maternal transport, as needed

**RECOGNITION & PREVENTION**

Every Patient
- Standard protocol for measurement and assessment of BP and urine protein for all pregnant and postpartum women
- Standard response to maternal early warning signs including listening to and investigating patient symptoms and assessment of labs (e.g. CBC with platelets, AST and ALT)
- Facility-wide standards for educating prenatal and postpartum women on signs and symptoms of hypertension and preeclampsia

ACOG District II Safe Motherhood Initiative
Readiness - Every Unit

Standards for early warning signs, diagnostic criteria, monitoring and treatment of severe preeclampsia/eclampsia

- Adopt standard of triggers for responding to changes in mother’s vital signs and clinical condition
  - MEOWS
- Adopt updated diagnostic criteria
  - ACOG Task Force on HTN in Pregnancy report
- Adopt protocols for evaluation, monitoring and treatment, including order sets and algorithms

Readiness - Every Unit

*Unit education on protocols, unit-based drills*

- Familiarize all team members with safety bundle and protocols
- Team-based drills to improve knowledge and skills, identify areas for improvement
- Post-drill debriefing
Readiness - Every Unit

Process for a timely triage and evaluation of pregnant and postpartum women with hypertension

- Every unit includes any unit where a pregnant woman might present – ED, urgent care
- All women of reproductive age should be asked about current or recent pregnancy
- Protocol for prompt assessment of symptoms
Readiness - Every Unit

**Rapid access to medications used for severe hypertension/eclampsia**

- Medications should be stocked and immediately available on L&D and other areas where patients may present (ED)
- Medications with uniform concentration and standard orders for administration
- Magnesium Sulfate, labetalol and/or hydralazine, nifedipine
Readiness - Every Unit

System plan for escalation, obtaining appropriate consultation, and maternal transport, as needed

• Criteria and protocol for escalation
  • Who/how to notify
  • Prompt bedside evaluation
  • Initiation of emergency diagnostic and therapeutic interventions
• Plan for rapid stabilization and transport
Preeclampsia Toolkit: Improving Health Care Response to Preeclampsia

Developed under contract #11-10006 with the California Department of Public Health; Maternal, Child and Adolescent Health Division; Published by the California Maternal Quality Care Collaborative, November 2013.
Recognition and Prevention - Every Patient

**Standard protocol for measurement and assessment of BP and urine protein for all pregnant and postpartum women**

- Protocol for accurate measurement of blood pressure – Timing, patient position, equipment
- Standard for assessment of urine protein based on lab availability and timing

**Table 1: Steps for Obtaining Accurate Blood Pressure Measurements**

<table>
<thead>
<tr>
<th>Step</th>
<th>Instructions</th>
</tr>
</thead>
</table>
| 1. Prepare equipment | a. Mercury sphygmomanometer is gold standard, can use validated equipment automated equipment  
  b. Check cuff for any defects  
  c. Obtain correct arm cuff width of the bladder 80% of circumference and extend 80% at arm (see Figure 1) |
| 2. Prepare the patient | a. Use a sitting or semi-reclining position with back supported and arm at heart level  
  b. Patient is at quiet for 5 minutes prior to measurement  
  c. Bare upper arm of any restrictive clothing  
  d. Patient’s arm should be flat, not dangling from examination table or bed, and her legs uncrossed  
  e. Assess any recent (less than 30 minutes) consumption of caffeine or nicotine. If blood pressure is at the level that requires treatment, consumption of nicotine or caffeine should not lead to delays in instituting appropriate and hypotensive therapy |
| 3. Take measurement | a. Support patient arm at heart level, seated in semi-reclining position  
  b. For auscultatory method: use first audible sound (Korotkoff I) as systolic pressure and disappearance of sound (Korotkoff V) as diastolic pressure  
  c. Read to the nearest 2 mm Hg  
  d. Instruct the patient not to talk  
  e. At least one additional readings should be taken within 15 minutes  
  f. Use the highest reading |
| 4. Record measurement | a. If greater than or equal to 140/90, repeat within 15 minutes and if still elevated, further evaluation for preclampsia is warranted  
  b. Do not reposition patient to either side to obtain a lower BP. This will give you a false reading |


Kristi Gabel, RNC-OB, C-EFM, MSN, CNS. **PATIENT CARE AND TREATMENT RECOMMENDATIONS ACCURATE BLOOD PRESSURE MEASUREMENT** (California Maternal Quality Care Collaborative Preeclampsia Toolkit). Published by the California Maternal Quality Care Collaborative, November 2013.
Recognition and Prevention - Every Patient

**Standard response to maternal early warning signs**

- Standardized risk assessment tool to enhance early recognition and treatment

Maurice L. Druzin, MD; Laurence E. Shields, MD; Nancy L. Peterson, RNC, PNNP, MSN; Valerie Cape, BSBA. **Preeclampsia Toolkit: Improving Health Care Response to Preeclampsia** (California Maternal Quality Care Collaborative Toolkit to Transform Maternity Care) Developed under contract #11-10006 with the California Department of Public Health; Maternal, Child and Adolescent Health Division; Published by the California Maternal Quality Care Collaborative, November 2013.
Recognition and Prevention - Every Patient

Facility-wide standards for educating prenatal and Postpartum women on signs and symptoms of hypertension and preeclampsia

- Inform women of the signs and symptoms of preeclampsia and when to notify their provider
  - Multiple opportunities – prenatal visits, childbirth class, hospital
  - Consider health literacy


http://www.preeclampsia.org/market-place/patient-education-materials/educational-brochures-preeclampsia-heart-disease-detail
Response - Every Case of Severe Hypertension/Preeclampsia

Facility-wide standard protocols with checklists and escalation policies for management and treatment of:

- Severe hypertension
- Eclampsia, seizure prophylaxis, and magnesium over-dosage
- Postpartum presentation of severe hypertension/preeclampsia
Response - Every Case of Severe Hypertension/Preeclampsia

Minimum requirements for protocols:

• Notification of physician or primary care provider if systolic BP =/> 160 or Diastolic BP =/> 110 for two measurements within 15 minutes.

• After the second elevated reading, treatment should be initiated ASAP (preferably within 60 minutes of verification)

• Includes onset and duration of magnesium sulfate therapy.

• Includes escalation measures for those unresponsive to standard treatment.

• Describes manner and verification of follow up within 7 to 14 days postpartum

• Describe postpartum patient education for women with preeclampsia.
Response - Every Case of Severe Hypertension/Preeclampsia

When patients have been admitted to the ICU or have had serious complications of severe hypertension facilities should have a support plan for:

– Families
– Staff
– Patients
**REPORTING/SYSTEMS LEARNING**

Every unit

- Establish a culture of huddles for high risk patients and post-event debriefs to identify successes and opportunities
- Multidisciplinary review of all severe hypertension/eclampsia cases admitted to ICU for systems issues
- Monitor outcomes and process metrics

Note: “Facility-wide” indicates all areas where pregnant or postpartum women receive care. (E.g. L&D, postpartum critical care, emergency department, and others depending on the facility.)

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**Hypertension Process Metrics Could Include:**

- Adherence to protocols for acute management
- Appropriateness of response to early warning criteria
- Documentation of education of pregnant and postpartum women about symptoms of preeclampsia for women at risk
- Occurrence of post severe maternal morbidity (SMM) event debrief and outcomes
- Timeliness of medication administration
- Timeliness of triage and evaluation

Note: These metrics are provided as an example and are not meant to serve as a comprehensive listing. Metrics for Reporting and Systems Learning can be modified to meet the particular needs of an institution.

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Establish a culture of huddles and debriefs to identify successes and opportunities for improvement

- Briefs, huddles and debriefs become part of the routine
- Will improve role clarity, situational awareness and utilization of available resources

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.

Identify what went well (Check if you):
- Communication
- Role clarity (leader/supporting roles identified and assigned)
- Teamwork
- Situational awareness
- Decision-making
- Other:

Identify opportunities for improvement: "Human factors" (Check if you):
- Communication
- Role clarity
- Teamwork
- Situational awareness
- Decision-making
- Human error
- Other:

Identify opportunities for improvement: "Systems issue" (Check if you):
- Equipment/supplies/accessibility
- Medication
- Blood products availability
- Inadequate support (in unit or other areas of the hospital)
- Delays in transporting the patient (within hospital or to another facility)
- Staffing
- Other:

For identified issues, please fill in table below:

<table>
<thead>
<tr>
<th>Issue</th>
<th>Actions to Be Taken</th>
<th>Person Responsible</th>
</tr>
</thead>
</table>

Fig. 1. Sample debrief tool for maternal severe morbidity or death—Montefiore Medical Center. Figure courtesy of C. Lee and D. Coffman. Used with permission.

Reporting/Systems Learning - Every Unit

Multidisciplinary review all severe hypertension/eclampsia cases admitted to ICU cases for systems issues

• Formal meetings to identify any systems issues or breakdowns that influenced the outcome of the event
• Multidisciplinary Perinatal Quality Committee
• Sanctioned and protected.

www.safehealthcareforeverywoman.org
Monitor outcomes and process metrics in perinatal quality improvement committee

- Process measures used to document the frequency that a new approach is used
- Outcome measures used to determine project success
- Goal: To reduce the number of severe hypertensive events that result in severe maternal morbidity or mortality
- Follow internally number of women who require ICU care
Available Resources

www.safehealthcareforeverywoman.org

Current

• **Downloadable 2-page PDF of bundle**
• Interactive bundle with links to resources relevant to each of the 4 R’s

### READINESS

**Every Unit**

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- System plan for escalation, obtaining appropriate consultation, and maternal transport, as needed

[Click here for Readiness Resources]

- Hypertensive Disorders During Pregnancy Checklists: Eclampsia (ACOG, District II)
- Hypertensive Disorders During Pregnancy Checklists: Postpartum Preeclampsia in the ED (ACOG, District II)
- Hypertensive Disorders During Pregnancy Checklists: Severe Hypertension in Pregnancy (ACOG, District II)
- Hypertension in Pregnancy Task Force Report (ACOG) - Coming Soon
Available Resources

www.safehealthcareforeverywoman.org

Future

- Jointly published Consensus Statement detailing the bundle components

**Consensus Statement**

**National Partnership for Maternal Safety**

**Consensus Bundle on Obstetric Hemorrhage**

Elliott K. Main, MD, Dena Goffman, MD, Barbara M. Scawone, MD, Lisa Kane Low, PhD, CNM, Debra Bingham, DPh, RN, Patricia L. Fontaine, MD, MS, Jed B. Gorlin, MD, David C. Lagrew, MD, and Barbara S. Levy, MD

Hemorrhage is the most frequent cause of severe maternal morbidity and preventable maternal mortality and therefore is an ideal topic for the initial national maternity patient safety bundle. These safety bundles outline critical clinical practices that should be implemented in every maternity unit. They are developed by multidisciplinary work groups of the National Partnership for Maternal Safety under the guidance of the Council on Patient Safety in Women’s Health Care. The safety bundle is organized into four domains: Readiness, Recognition and Prevention, Response, and Reporting and System Learning. Although the bundle components may be adapted to meet the resources available in individual facilities, standardization within an institution is strongly encouraged. References contain sample resources and “Potential Best Practices” to assist with implementation.

Obstetric hemorrhage is the most common serious complication of childbirth and is the most preventable cause of maternal mortality. Furthermore, recent data suggest that rates of obstetric hemorrhage are increasing in developed countries, including the United States, and that rates of hemorrhage-associated severe maternal morbidity exceed the morbidities associated with other obstetric and medical conditions.

Standardized, comprehensive, multidisciplinary

Large-Scale Implementation
How do we reach EVERY hospital in the US?

✓ Engage every Professional organization
  ✓ State-level groups
✓ Engage every Hospital organization
✓ The Joint Commission
✓ CMMI: Hospital Engagement Networks
✓ State Health Departments
✓ State Maternal Quality Collaboratives
✓ Different models of QI (IHI, mentoring, etc.)
Key Partners: State Quality Collaboratives

CMQCC
California Maternal Quality Care Collaborative

PQCNC
New York State Perinatal Quality Collaborative

nyspQC
Perinatal Quality Collaborative

FPQC
Florida Perinatal Quality Collaborative

IL PQC
Illinois Perinatal Quality Collaborative

NNE PQIN

MHA: Obstetrics
Keystone Center
Things to Remember

- The development of a multidisciplinary taskforce with physician and nursing champions from OB, anesthesia, and critical care is crucial for success.
- Don’t reinvent the wheel—use available resources to help develop and implement your hospital’s individualized response plan.
- Simulation is a great way to educate, practice new behaviors and test your infrastructure—make time for it.
- Debriefings are critical for continuous quality improvement and effective debriefing is a skill that needs to be taught and practiced.
Q&A Session

Press *1 to ask a question

You will enter the question queue
Your line will be unmuted by the operator for your turn

A recording of this presentation will be made available on our website: www.safehealthcareforeverywoman.org
Next Safety Action Series

Blood Pressure Basics

Friday, July 17, 2015 | 12:30 PM Eastern

John Barton, MD, MPH, FACOG
Director, Maternal-Fetal Medicine
Central Baptist Hospital

Nancy Peterson, RNC, PNNP, MSN,
Clinical Program Manager, CMQCC
Director, Perinatal Outreach at Stanford University

Click Here to Register