Obstetrics Breakout Session: Severe Maternal Hypertension Safety Bundle

2019 Texas Collaborative for Healthy Mothers and Babies Summit
January 29-30, 2019
Why we do this work

Severe Maternal Hypertension

Preeclampsia:
4-10% US pregnancies

9% of maternal deaths in the United States

IUGR, oligohydramnios, placental abruption, NICU admission, stillbirth, neonatal death

1/3 of severe obstetric complications

6% of preterm births, and 19% of medically indicated induced preterm births
Why we do this work
Importance of Timely Treatment of Severe Maternal Hypertension

- Primary cause of maternal death is hemorrhagic stroke caused by untreated severe hypertension
- National guidelines recommend timely treatment of severe hypertension < 60 min to reduce maternal stroke and severe maternal morbidity, endorsed by ACOG
- Alliance for Innovation on Maternal Health (AIM) Severe Hypertension in Pregnancy Maternal Safety Bundle
Aim: Reduce the rate of severe morbidities in women with severe preeclampsia, eclampsia, or preeclampsia superimposed on pre-existing hypertension by 20% by December 2017

Approach: 4 key goals
1. Reduce time to treatment
2. Improve postpartum patient education
3. Improve postpartum patient follow up
4. Improve provider & RN debrief

- 110 hospital teams - May 2016 kick off to December 2017
- 106 Hospitals submitted data for over 17,000 women who experienced severe maternal HTN across the initiative
- Sustainability started January 2018
- 86 teams have submitted sustainability data
Key Driver Diagram: Maternal Hypertension Initiative

GOAL: To reduce preeclampsia maternal morbidity in Illinois hospitals

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**Key Drivers**

**GET READY**
IMPLEMENT STANDARD PROCESSES for optimal care of severe maternal hypertension in pregnancy

**RECOGNIZE**
IDENTIFY pregnant and postpartum women and ASSESS for severe maternal hypertension in pregnancy

**RESPOND**
TREAT in 30 to 60 minutes every pregnant or postpartum woman with new onset severe hypertension

**CHANGE SYSTEMS**
FOSTER A CULTURE OF SAFETY and improvement for care of women with new onset severe hypertension

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**Interventions**

- Develop standard order sets, protocols, and checklists for recognition and response to severe maternal hypertension and integrate into EHR
- Ensure rapid access to IV and PO anti-hypertensive medications with guide for administration and dosage (e.g. standing orders, medication kits, rapid response team)
- Educate OB, ED, and anesthesiology physicians, midwives, and nurses on recognition and response to severe maternal hypertension and apply in regular simulation drills
- Implement a system to identify pregnant and postpartum women in all hospital departments
- Execute protocol for measurement, assessment, and monitoring of blood pressure and urine protein for all pregnant and postpartum women
- Implement protocol for patient-centered education of women and their families on signs and symptoms of severe hypertension
- Execute protocols for appropriate medical management in 30 to 60 minutes
- Implement a system to provide patient-centered discharge education materials on severe maternal hypertension
- Implement protocols to ensure patient follow-up within 10 days for all women with severe hypertension and 72 hours for all women on medications
- Establish a system to perform regular debriefs after all new onset severe maternal hypertension cases
- Establish a process in your hospital to perform multidisciplinary systems-level reviews on all severe maternal hypertension cases admitted to ICU
- Incorporate severe maternal hypertension recognition and response protocols into ongoing education (e.g. orientations, annual competency assessments)

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**AIM: By December 2017, to reduce the rate of severe morbidities in women with preeclampsia, eclampsia, or preeclampsia superimposed on pre-existing hypertension by 20%**
## Project Aims

By December 2017, for all women with confirmed severe maternal HTN across participating hospitals:

<table>
<thead>
<tr>
<th>Goal</th>
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<tr>
<td>Increase the proportion of women treated for severe HTN in &lt; 60 minutes</td>
<td>≥ 80%</td>
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<td>Increase the proportion of women receiving preeclampsia education at discharge</td>
<td>≥ 80%</td>
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<td>Increase the proportion of women with follow-up appointments scheduled within 10 days of discharge</td>
<td>≥ 80%</td>
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<td>Increase the proportion of cases with provider / nurse debriefs</td>
<td>≥ 50%</td>
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<td>Reduce the rate of severe maternal morbidity (SMM)</td>
<td>↓20%</td>
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How do we improve care?

- Early recognition of hypertension and correct diagnosis during and after pregnancy
- Reduce time to treatment of severe range blood pressure, 160/110(105)
- Provide patient education and appropriately timed follow up
- Implementation of evidence based protocols for treatment and management of severe HTN / preeclampsia / eclampsia
Controlling blood pressure is the optimal intervention to prevent deaths due to stroke in women with preeclampsia.

The critical initial step in decreasing maternal morbidity and mortality is to administer anti-hypertensive medications as soon as possible (< 60 minutes) of documentation of persistent (retested within 15 minutes) BP ≥ 160 systolic, and/or ≥ 105-110 diastolic.

BP ≥ 160/110 (105) → Need To Treat*

*BP persistent 15 minutes, activate treatment algorithm with IV therapy ASAP, < 30-60 minutes
Quality Improvement Focus

• Provider / staff education and standardized BP measurement
• Rapid access to medications
• IV treatment of BP’s ≥ 160mmHg systolic or ≥ 110(105) mmHg diastolic within 30-60 min
• Standardize treatment algorithms / order sets
• Provider / nurse debrief time to treatment
• Early postpartum follow-up
• Standardized postpartum patient education
Quality Improvement Strategy

ILPQC facilitated:

- Development of hospital-based QI teams by April 2016
- **Collaborative learning** through 4 in-person meetings, 21 monthly webinars, and 15 QI topic calls with teams
- **Rapid-response data system** for teams to compare data across time and to other hospitals
- **QI support** through a toolkit, network meetings, and QI coaching calls to individual hospital teams
- Regular communications including twice-monthly e-newsletters to teams and website with resources
Quality Improvement Strategy

Hospital teams facilitated:

• Representatives from each team at twice yearly in-person ILPQC meetings
• Monthly participation in ILPQC webinars
• Collection and submission of monthly QI data and quarterly structure measures to ILPQC Data System
• Monthly QI team meetings to review data and develop and implement QI strategies with Plan Do Study Act (PDSA) cycles
Severe Hypertension Treatment Algorithm

**IV Anti-Hypertension Meds**
- **First Line Medications**
  - **IV Labetalol** 20 mg (over 2 min)
  - Repeat BP in 10 min
    - If elevated, administer **IV Labetalol 40 mg**
    - Repeat BP in 10-15 min
      - If elevated, administer **IV Labetalol 80 mg**
      - Repeat BP in 20 min
        - If elevated, **IV Hydralazine 10 mg**
        - Repeat BP in 20 min
          - If elevated, **IV Hydralazine 10 mg**

**Blood Pressure Triggers**
- SBP ≥ 160 and/or DBP ≥ 110
  - Repeat in 15 minutes.
  - Notify Provider and Proceed

**Seizure Prophylaxis**
- **Magnesium Sulfate**
  - **Bolus Dose**: 4gm over 20 minutes
  - **Maintenance Dose**: 2gm per hour

**PO Nifedipine**
- If no IV access
  - **Initial Dose**: 10 mg
  - May repeat dose at 20 minute intervals for a maximum of 5 doses.
Data Collection

- Process and outcome measures collected by ongoing monthly chart review by hospital teams
- Inclusion criteria
  - All first cases of severe maternal HTN during pregnancy through 6 weeks postpartum in participating hospitals
  - Severe Maternal HTN defined as BP ≥ 160/110 persistent for ≥ 15 minutes
- Timeline
  - Baseline: October – December 2015
  - Initiative Launch May 2016
  - Monthly data collection through December 2017
  - Monthly compliance data collection ongoing
Key Measures

- **Outcome**: Severe Maternal Morbidity
- **Process**: Time to treatment, Patient discharge education, Patient follow up visit < 10 days, Debrief
- **Balancing**: Hypotension, Fetal heart rate
- **Structure**:
  - Facility-wide protocols for timely identification and treatment of severe maternal hypertension
  - Provider /nurse education on HTN protocols
  - Rapid access to IV medications
  - System plan for escalation of care
  - Facility-wide protocols for patient education
ILPQC Data System

Hospital Teams collect data through chart audit and real time data logs.

Hospital Teams enter monthly outcome, balancing and process and quarterly structure measures into REDCap.

Hospital Teams immediately access rapid response web based reports to compare data across time and to other IL hospitals.
ILPQC Data System

ILPQC: Maternal Hypertension Initiative
Percent of Cases with New Onset Severe Hypertension Treated within 60 Minutes
Hospital 044 & Select Comparisons, 2016 - 2018

- ILPQC Data System
- ILPQC HTN Data Form
- REDCap Data Portal
- Real-Time Data Reports
Structure Measure:
Standard Policies / Protocols Across Units

Percent of hospitals with standard protocols for early warning signs, updated diagnostic criteria, monitoring and treatment of severe preeclampsia/eclampsia (include order sets and algorithms)

Q2 2016 (Apr-Jun) (N=21)  |  Q3 2016 (Jul-Sep) (N=32)  |  Q4 2016 (Oct-Dec) (N=41)  |  Q1 2017 (Jan-Mar) (N=51)  |  Q2 2017 (Apr-Jun) (N=47)  |  Q3 2017 (Jul-Sep) (N=30)

L&D  |  Ante/postpartum  |  Triage/ED

IL PQC
Illinois Perinatal Quality Collaborative
Structure Measure: Provider & Nurse Education

Culumative percent of OB providers and nurses completed (within the last 2 years) implementation education on the Severe HTN/Preeclampsia bundle elements and unit-standard protocol.
Maternal Hypertension Data: Time to Treatment

ILPQC: Maternal Hypertension Initiative
Percent of Cases with New Onset Severe Hypertension Treated in <30, 30-60, ≥60 minutes or Not Treated
All Hospitals, 2016-2018

Wow!
Maternal Hypertension Data: Patient Education

ILPQC: Maternal Hypertension Initiative
Percent of Women with New Onset Severe Hypertension Who Received Discharge Education Materials and Proportion of Hospitals in Collaborative Giving Discharge Education to Women
All Hospitals, 2016-2018

- Proportion of Hospitals with 80% of women who received discharge materials
- Proportion of Hospitals with 0-79% of women who received discharge materials
- Percent overall women in collaborative who received discharge materials
Maternal Hypertension Data: Patient Follow-up

ILPQC: Maternal Hypertension Initiative

Percent of Women with New Onset Severe Hypertension Where Follow-up Appointments were Scheduled within 10 Days and Proportion of Hospitals in Collaborative Where Follow-Up Appointments were Scheduled within 10 Days

All Hospitals, 2016-2018
Severe Maternal Hypertension
Time To Treatment Debriefed

Proportion of Hospitals with 0-50% of cases debriefed

Percent of women in collaborative with Cases Debriefed
Maternal Hypertension Outcome Data: Severe Maternal Morbidity

ILQPC: Women with New Onset HTN with Severe Maternal Morbidity
All Hospitals, 2016-2017

Severe Maternal Morbidity Diagnoses:
- Intracranial Hemorrhage or Ischemic event (stroke)
- Eclampsia
- Pulmonary Edema
- HELLP Syndrome
- Oliguria
- DIC
- Renal Failure
- Liver Failure
- Ventilation
- Placental Abruption
- OB Hemorrhage
- ICU Admission

15% 40% Change! 9%

13,263 patients included
Between 2015-Q4 and 2017-Q4, the SMM rate among women experiencing hypertension at delivery was cut in half.
Building HTN Sustainability Post-Initiative:

All teams submit a Severe HTN Sustainability Plan

1. Compliance tracking for all cases severe HTN in ILPQC Data System, plan for monitoring & response
   - Time to treatment severe HTN under an hour
   - Magnesium provided
   - Early follow up for BP check within 7-10 days
   - Patient education at discharge

2. Ongoing education for providers and nurses (drills, simulations, e-modules)

3. Education plan for new hires
Reducing Time To Treatment

Elements of Maternal Hypertensive Bundle Most Effective in Reducing Time to Treatment

ILPQC Team Survey, 2017
HTN Goals in 2019

- Every hospital maintain Time to Treatment above goal – benchmark and review data
- Maintain sustainability plan
  - Continue compliance monitoring
  - New hire education
  - Continued education
- Review missed opportunities with providers/staff
- ILPQC will maintain RedCap Data Reports
- Propose 2 HTN calls in 2019
- Continue to support discussions at Perinatal Network meetings
Questions?

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