Illinois Maternal Hypertension Initiative: Improving Outcomes through Evidenced Based Practice

Presented by:
Acknowledgments

This slide set was adapted from materials created by the following groups:

• FPQC Hypertension in Pregnancy Initiative
  • http://health.usf.edu/publichealth/chiles/fpqc/hip

• CMQCC Preeclampsia Collaborative
  • https://www.cmqcc.org/projects/past-projects/cmqcc-preeclampsia-collaborative

• ACOG DII (New York) Safe Motherhood Initiative
  • https://www.acog.org/About-ACOG/ACOG-Districts/District-II/Safe-Motherhood-Initiative

• AIM Severe Hypertension in Pregnancy Bundle
  • http://www.safehealthcareforeverywoman.org/secure/hypertension-bundle.php
ILPQC Severe Maternal Hypertension Initiative
Background

• Worldwide and in the United States, hypertension is one leading cause of pregnancy-related deaths (PRDs) before, during, or after delivery.

• Reports from North Carolina and California state that maternal deaths due to hypertension had significant prevention opportunities. (Berg, C. et al., 2005 & California Department of Public Health, 2011)
Maternal Morbidity


Rate per 10,000 delivery hospitalizations

Maternal Mortality

**Odd one out**

Maternal-mortality rate, per 100,000 live births

- **Developed countries**
- Germany
- Japan
- **United States**
- Britain

Source: Kassebaum et al, Lancet

Economist.com
Maternal Mortality Rate, California Residents: 1970-2010

- California Rate
- United States Rate

Year: 1999-2013

- PreE Taskforce
- PreE Toolkit
- Hemorrhage Taskforce
- Hemorrhage Toolkit
Prevalence – ACOG 2013

• Incidence of preeclampsia has increased by 25% in the past 20 years
• Preeclampsia causes an estimated 60,000 maternal deaths yearly worldwide
• There are 50 –100 near misses for every maternal death
• Preeclampsia is a risk for future cardiovascular disease
Classification of Maternal Hypertension:
1) Gestational Hypertension
2) Preeclampsia-Eclampsia
3) PE with severe features
4) Chronic Hypertension
5) Chronic Hypertension With Superimposed Preeclampsia
6) Postpartum Hypertension
Management Maternal Hypertension

1) Recognize Symptoms
2) BP control using Severe Mat HTN Protocols
3) Seizure prevention with Magnesium
4) Delivery - 34 wks, 37wks, earlier if indicated
5) Postpartum pt education and surveillance
## Where are the gaps?

### Contributing Factors to Maternal Death

<table>
<thead>
<tr>
<th></th>
<th>Preeclampsia</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HEALTHCARE PROFESSIONALS</strong></td>
<td>96%</td>
<td>79%</td>
</tr>
<tr>
<td>Delay in Diagnosis</td>
<td>92% 1.7x</td>
<td>54%</td>
</tr>
<tr>
<td>Use of Ineffective Treatment</td>
<td>79% 1.6x</td>
<td>42%</td>
</tr>
<tr>
<td>Misdiagnosis</td>
<td>54% 1.7x</td>
<td>31%</td>
</tr>
</tbody>
</table>

**HEALTHCARE FACILITY**

<table>
<thead>
<tr>
<th></th>
<th>Preeclampsia</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12 (48%)</td>
<td>72 (50%)</td>
</tr>
</tbody>
</table>
Where are the gaps?

<table>
<thead>
<tr>
<th>Contributing Factors to Maternal Death</th>
<th>Preeclampsia</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PATIENT FACTORS</strong></td>
<td>64%</td>
<td>72%</td>
</tr>
<tr>
<td>Delay or Failure to Seek Care</td>
<td>63% 2.4x</td>
<td>26%</td>
</tr>
<tr>
<td>Lack of Understanding of the Importance of Health Event</td>
<td>56% 3.7x</td>
<td>15%</td>
</tr>
</tbody>
</table>
Maternal Recognition Improves Outcomes

“The best way to diagnose preeclampsia is to listen to your patients.”

~ Dr. Baha Sibai
Did Comprehension Lead to Action?

- 1:5 recalled information and understood it!
- 75% v.6% acted if they had symptoms

317 Received the information

Understood it?

51%
  Yes

75%
  Acted

25%
  Didn’t Act

49%
  No/Not Fully

6%
  Acted

94%
  Didn’t Act

J Mat-Fet Neo Medicine 2013
What is it?

Why should you care?

What should you pay attention to?

What should you do if you have any of the signs?

**Pre-eclampsia**

**What Is It?**
Pre-eclampsia is a serious disease related to high blood pressure. It can happen to any pregnant woman.

**Risks to You**
- Seizures
- Stroke
- Organ damage
- Death

**Risks to Your Baby**
- Premature birth
- Death

**Signs of Pre-eclampsia**
- Stomach pain
- Headaches
- Feeling nauseous; throwing up
- Seeing spots
- Swelling in your hands and face
- Gaining more than 5 pounds in a week

**What Should You Do?**
Call your doctor right away. Finding pre-eclampsia early is important for you and your baby.

More information go to www.pre-eclampsia.org

Am J Obstet Gynecol 2012
Preeclampsia Awareness
2014 Survey Results Show:

High overall awareness of preeclampsia among expectant and new mothers*

- **83%** had heard of preeclampsia

Most are also aware that this serious condition related to high blood pressure requires immediate medical evaluation

- **99%** knew preeclampsia is serious, even life-threatening, for mother and baby

- **88%** knew high blood pressure is a sign of preeclampsia

- **96%** would call their doctor or midwife if they experienced symptoms

Yet despite high overall awareness, there is less knowledge of the symptoms

More than half of respondents did not associate many known symptoms with preeclampsia

Other important aspects of preeclampsia are also less known

- **44%** didn’t know that preeclampsia can occur up to six weeks after delivery

- **46%** didn’t know that women with preeclampsia are at greater risk for future health problems

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*Survey conducted among visitors to the BabyCenter website from January 17 to January 20, 2014. Total of 1,591 respondents completed the survey; qualified respondents defined as female U.S. residents, 18 years or older, who are pregnant or have at least one child three years of age or younger.

Survey by BabyCenter®
Design by rEVO Biologics Inc.
Key Clinical Pearl

Patients with vague symptoms of:

- headache
- abdominal pain (possibly “referred” pain to neck, shoulder, back)
- shortness of breath
- generalized swelling, extreme weight gain
- complaints of “I just don’t feel right”
- Visual disturbances

Need to be evaluated for atypical presentations of preeclampsia with “severe features”
Historically How Well Do We Treat Maternal BP?

Common Mistakes:
- Treating only if diastolic pressure >110
- Treating BP with magnesium
- Not treating if there is no proteinuria
- Waiting for 6 hours
Diagnosis and Management of Preeclampsia and Eclampsia

Summary of Recommendations

The following recommendations are based on good and consistent scientific evidence (Level A):

- Magnesium sulfate should be used for the prevention and treatment of seizures in women with severe preeclampsia or eclampsia.

- Expectant management should be considered for women remote from term who have mild preeclampsia.

- Antihypertensive therapy (with either hydralazine or labetalol) should be used for treatment of diastolic blood pressure levels of 105–110 mm Hg or higher.
Cause of U.S. Maternal Mortality

- CDC Review of 14 years of coded data: 1979-1992
- 4024 maternal deaths 790 (19.6%) from preeclampsia

Table 2. Specific Causes of Death Among Women Who Died of Preeclampsia or Eclampsia

<table>
<thead>
<tr>
<th>Cause of death</th>
<th>Preeclampsia</th>
<th>Eclampsia</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cerebrovascular events</td>
<td>17.3</td>
<td>21.4</td>
<td>38.7</td>
</tr>
<tr>
<td>Cerebrovascular hemorrhage</td>
<td>15.8</td>
<td>18.8</td>
<td>34.7</td>
</tr>
<tr>
<td>Cerebral edema</td>
<td>1.1</td>
<td>1.8</td>
<td>2.9</td>
</tr>
<tr>
<td>Cerebral embolus</td>
<td>0.4</td>
<td>0.8</td>
<td>1.1</td>
</tr>
<tr>
<td>Renal or hepatic failure</td>
<td>7.2</td>
<td>5.4</td>
<td>12.5</td>
</tr>
<tr>
<td>HELLP syndrome</td>
<td>4.8</td>
<td>2.3</td>
<td>7.1</td>
</tr>
<tr>
<td>Other complications of hypertension</td>
<td>13.9</td>
<td>11.8</td>
<td>25.7</td>
</tr>
<tr>
<td>Not specified hypertension</td>
<td>7.6</td>
<td>8.3</td>
<td>15.9</td>
</tr>
<tr>
<td>Preeclampsia and eclampsia</td>
<td>50.8</td>
<td>49.2</td>
<td>100</td>
</tr>
</tbody>
</table>

HELLP = hemolysis, elevated liver enzymes, and low platelet count syndrome.


90% of CVA were from hemorrhage
BP Associated Major Morbidity

- Stroke
- Placental Abruption
- Eclampsia
- Cerebral Edema/PRES
- Retinal Detachment
- Liver Hematoma/Rupture

- Renal Failure
- Hemorrhage/DIC
- Pulmonary Edema
- Ascites/pleural effusion
– 23/24 (95.8%) women with systolic BP ≥ 160mm Hg
– 24/24 (100%) had a BP ≥ 155 mm Hg
– 3/24 (12.5%) women with diastolic BP > 110mm Hg
– 5/28 (20.8%) women with diastolic BP > 105mm Hg
Preeclampsia Treatment Recommendations

<table>
<thead>
<tr>
<th>Systolic</th>
<th>Diastolic</th>
<th>Repeat BP and Treat Within 30-60 minutes (ideally ASAP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥160</td>
<td>≥110</td>
<td></td>
</tr>
<tr>
<td>≥155</td>
<td>≥105-110</td>
<td>Alternative triggers*</td>
</tr>
</tbody>
</table>

Recommendations apply to all forms of hypertension:

Gestational HTN = Preeclampsia = chronic HTN
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


- OB Advisory Workgroup and HTN Clinical Leadership Team developed process/outcome measures, toolkit/education, data form and reports
- Input from IDPH SQC / PNAs / AIM Initiative / CA, NY, and NC
- Launched Wave 1 in January 2016 with 24 teams
- Launched Wave 2 on May 2, 2016 with 110 teams
What are we trying to accomplish?

- Early recognition of hypertension and correct diagnosis during and after pregnancy
- Reduce time to treatment of severe range blood pressure, 160/110(105)
- Deliver not too early and not too late
- 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 antihypertensive 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
### ILPQC HTN Initiative

**Goal & Measures**

Goal: Reduce preeclampsia maternal morbidity

<table>
<thead>
<tr>
<th>IL Measure</th>
<th>Type</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Severe Maternal Morbidity</strong>&lt;br&gt;No. of women with severe maternal morbidities (e.g. Acute renal failure, ARDS, Pulmonary Edema, Puerperal CNS Disorder such as Seizure, DIC, Ventilation, Abruption) / No. pregnant &amp; postpartum women with new onset severe range HTN</td>
<td>Outcome</td>
<td>20% reduction</td>
</tr>
<tr>
<td><strong>Appropriate Medical Management in under 60 minutes</strong>&lt;br&gt;No. of women treated at different time points (30, 60, 90, &gt;90 min) after elevated BP is confirmed / No. of women with new onset severe range HTN</td>
<td>Process</td>
<td>100%</td>
</tr>
<tr>
<td><em><em>Debriefs on all new onset severe range HTN</em> cases</em>*</td>
<td>Process</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Discharge education and follow-up</strong> within 10 days for all women with severe range HTN, 72 hours with all women with severe range HTN on medications</td>
<td>Process</td>
<td>100%</td>
</tr>
</tbody>
</table>

Severe range HTN: ≥160 systolic / ≥110(105) diastolic per hospital standard

*New onset severe range HTN: first episode of persistent severe range HTN (lasting >15 minutes) in a hospitalization (ER, L&D, or other inpatient setting), can be chronic HTN, gestational HTN, preeclampsia and/or postpartum diagnosis.
Opportunities for Quality Improvement

• Early recognition of hypertension and response to clinical triggers of preeclampsia (pregnant and pp)
• Importance of accurate BP measurement and identify severe range BP across all units.
• Reduce time to treatment for BP ≥160/110(105)
• Implement standardized use of ACOG protocols for acute treatment of severe range BP
• Coordination of care (L&D, PP, ED, ICU) and timely evaluations and consultations
• Postpartum follow-up and patient education
Where to start?

- 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
- Early postpartum follow-up
- Standardized postpartum patient educational materials.
Importance of Obtaining Accurate Blood Pressure

- Failing to accurately measure blood pressure in a consistent manner can lead to misdiagnosis, delays in treatment, worsening disease, increased morbidity and even death.
- Accurate blood pressure measurement is essential for clinical decision making
  - Correct positioning of the woman
  - Proper equipment (cuff sizes and shapes; calibrated readings)
Clinical Pearls

• Take time to use correct equipment and measure her arm
• Position the woman correctly
• Initial blood pressure should be assessed after the woman has been resting with minimal distraction for 5 minutes.
• BP ≥160/110(105) lasting for 15 minutes should be treated in under 30-60 minutes

Initial BP is ≥
140 systolic OR
≥ 90 diastolic

• Repeat blood pressure in 15 minutes
• Take in the same arm
• Do not reposition to side-lying

Evaluate for preeclampsia

Initial BP is ≥
160 systolic or
≥ 110(105) diastolic

• Notify provider after first elevated BP
• Reassess after 15 minutes
• Activate treatment algorithms if remains ≥160/110(105)

Activate Severe HTN Treatment Algorithm
Hypertensive Medication Administration Oral versus IV

- **First line therapy** recommendations for acute treatment of critically elevated BP [\(>160/110(105)\)] are with either IV labetalol or hydralazine.

- In a patient **without IV access** oral immediate release nifedipine **may be used** (10 mg) and may be repeated in 30 minutes.

- PO (oral not sublingual) nifedipine appears equally as efficacious as IV labetalol in correcting severe BP elevations.

- **PO labetalol** would be expected to be less effective in acutely lowering the BP due to its slower onset to peak and thus **should be used only if nifedipine is not available in a patient without IV access.**

Hypertensive Medication Administration: Oral v. IV

- **IV Labetalol**
  - Onset: 2-5 min
  - *Peak: 5 min*

- **PO Labetalol:**
  - Onset: 20 min-2 hrs
  - *Peak: 1-4 hrs*

- **IV Hydralazine**
  - Onset: 5-20 min
  - *Peak: 15-30 min*

- **PO Nifedipine**
  - Onset: 5-20 min*
  - *Peak: 30-60 min*

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**

- **IV Hydralazine**
  - 5 or 10 mg (over 1-2 min)
  - Per physician’s order
  - Repeat BP in 20 min
  - If elevated, administer
  - **IV Hydralazine 10 mg**

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

**SBP > 155 and/or DBP > 105**
Provider Notified

**Seizure Prophylaxis**

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

**IV Access**
FHR monitoring
Labs per PIH Order Set
Pulse Oximeter

**PO Nifedipine**
If no IV access
Initial Dose: 10 mg
May repeat dose at 20 minute intervals for a maximum of 5 doses.
Algorithms for acute treatment hypertension and eclampsia should be readily available or preferably posted in all clinical areas that may encounter pregnant women.

Note that the CMQCC Algorithm includes: treatment for severe HTN, also start Magnesium for Seizure Prevention, send preeclampsia labs, start monitoring for mom and baby.
**ACOG protocol**

**Standing Order (Labetalol)**

- **Labetalol 20 mg** IV over 2 minutes
  - Recheck in 10 min

- If still elevated, **labetalol 40 mg** IV over 2 min
  - Recheck in 10 min

- If still elevated, **labetalol 80 mg** IV over 2 min
  - Recheck in 10 min

- Switch to hydralazine 10 mg IV over 2 min
  - Recheck in 20 min
  - Seek urgent consultation MFM, Critical Care, Anesthesia, Internal medicine

Target B/P 140 to <160 or 90-100
ACOG protocol
Standing Order (Hydralazine)

Hydralazine 5 or 10 mg IV over 2 minutes
• Recheck in 20 min

If still elevated, hydralazine 10 mg IV over 2 min
• Recheck 20 min

If still elevated, labetalol 20 mg IV over 2 min
• Recheck in 10 min

If still elevated, labetalol 40 mg IV over 2 min
• Emergency consults: MFM and anesthesia

Target B/P 140 to <160 or 90-100
ACOG protocol
Standing Order (Oral Nifedipine)

Nifedipine 10 mg PO (never crush or give SL)
  • Recheck in 20 min

If still elevated, nifedipine 20 mg PO
  • Recheck 20 min

If still elevated, nifedipine 20 mg PO
  • Recheck in 20 min
  • Emergency consults: MFM and anesthesia, critical care or internal medicine

If still elevated, administer labetalol 40 mg IV and obtain result
3029 received Nifedipine for BP treatment

- 1469 Magnesium
  - Hypotension 0.4%
- 1560 No Magnesium
  - Hypotension 0.3%

Magpie Trial: Lancet 2002; 359:1877
Timely Treatment of BP

CMQCC

Dignity Health


IL PQC
Illinois Perinatal Quality Collaborative
Magnesium Therapy: Key Clinical Pearl

- Magnesium sulfate therapy for seizure prophylaxis (DOES NOT TREAT HTN) should be administered to any patients with:
  - Preeclampsia with “severe features” i.e., subjective neurological symptoms (headache or blurry vision), abdominal pain, epigastric pain, OR BP > 160/110.
    - Do not need to wait for protein or wait 6 hours for confirmation. New onset severe HTN = treat BP and start Magnesium for seizure prevention.
  - Eclampsia

- Should be considered in patients with preeclampsia without severe features
## Who Should Get Magnesium?

<table>
<thead>
<tr>
<th></th>
<th>Mild Preeclampsia</th>
<th>Severe Preeclampsia</th>
<th>Eclampsia</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACOG</td>
<td>NU#</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>NICE</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>SOGC</td>
<td>X*</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CMQCC</td>
<td>X*</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>WHO</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

*Should be considered: NNT = 109 for mild, 63 for severe*  
(NNT = number needed to treat)  
# Not Universally”
Do women with pre-eclampsia, and their babies, benefit from magnesium sulfate?

- 58% reduction in seizures
- 45% reduction in maternal death*
- 33% reduction in placental abruption
BP Normalized

- BP taken in sitting or semi-fowlers
- Cuff size correct
- Nurse verifies cuff placed correctly
- Automated cuff calibrated
- Verification occurs within 15 min of abnormal value
Blood Pressure and Severe Maternal Morbidity
Kilpatrick SJ, AJOG, 2016

**TABLE 3**
Antihypertensive treatment and severe maternal morbidity rates by increasing blood pressure severity in severely hypertensive women

<table>
<thead>
<tr>
<th>Categories of Severe Systolic Blood Pressure</th>
<th>Categories of Severe Diastolic Blood Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mildly severe (160–172) (^a)</td>
<td>Mildly severe (105–112) (^a)</td>
</tr>
<tr>
<td>Moderately severe (173–192) (^a)</td>
<td>Moderately severe (113–122) (^a)</td>
</tr>
<tr>
<td>Very severe (193–260) (^a)</td>
<td>Very severe (123–167) (^a)</td>
</tr>
<tr>
<td>(P) value</td>
<td>(P) value</td>
</tr>
<tr>
<td>Treatment status (^b)</td>
<td>Treatment status (^b)</td>
</tr>
<tr>
<td>n = 1000 n (%)</td>
<td>n = 564 n (%)</td>
</tr>
<tr>
<td>Treated</td>
<td>Treated</td>
</tr>
<tr>
<td>790 (79.0)</td>
<td>464 (82.3)</td>
</tr>
<tr>
<td>n = 1037 n (%)</td>
<td>n = 577 n (%)</td>
</tr>
<tr>
<td>Severe maternal morbidity</td>
<td>Severe maternal morbidity</td>
</tr>
<tr>
<td>91 (8.8)</td>
<td>47 (8.2)</td>
</tr>
<tr>
<td>SMM</td>
<td>SMM</td>
</tr>
<tr>
<td>74 (8.4)</td>
<td>25 (10.0)</td>
</tr>
<tr>
<td>19 (9.3)</td>
<td>10 (12.1)</td>
</tr>
</tbody>
</table>

\(^a\) Blood pressure categories defined as follows:
- Systolic BP: Mild: 160-172, Moderate: 173-192, Severe: >192
- Diastolic BP: Mild: 105-112, Moderate: 113-122, Severe: >123

\(^b\) Treatment status: Treated vs. Not treated.

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*SMM, severe maternal morbidity.*
Magnesium Sulfate is **not** an antihypertensive

- Primary effect is via CNS depression
- Improves blood flow to CNS via small vessel vasodilation
- Blood pressure after magnesium infusion:
  - 6 gm loading then 2 gm/hr.

<table>
<thead>
<tr>
<th>Group</th>
<th>sBP</th>
<th>sBP 30 min</th>
<th>sBP 120 min</th>
<th>dBP</th>
<th>dBP 30 min</th>
<th>dBP 120 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild Group</td>
<td>145 ±10</td>
<td>143 ±13</td>
<td>141 ±14</td>
<td>87 ±10</td>
<td>79 ±9</td>
<td>82 ±9</td>
</tr>
</tbody>
</table>

“Prefer Oral Medication”
Meeting treatment goal of <155/105

<table>
<thead>
<tr>
<th>Medication</th>
<th>n</th>
<th>Column %</th>
<th>Pretreatment SBP Mean (SD)</th>
<th>Pretreatment DBP Mean (SD)</th>
<th>Met treatment goal</th>
<th>n</th>
<th>Row %</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV hydralazine</td>
<td>611</td>
<td>33.9</td>
<td>177 (15)</td>
<td>102 (12)</td>
<td>418</td>
<td>68.4</td>
<td></td>
</tr>
<tr>
<td>IV labetalol</td>
<td>1057</td>
<td>58.6</td>
<td>175 (14)</td>
<td>102 (12)</td>
<td>748</td>
<td>70.8</td>
<td></td>
</tr>
<tr>
<td>PO nifedipine</td>
<td>38</td>
<td>2.1</td>
<td>174 (14)</td>
<td>100 (12)</td>
<td>31</td>
<td>81.6</td>
<td></td>
</tr>
<tr>
<td>PO labetolol</td>
<td>98</td>
<td>5.4</td>
<td>175 (15)</td>
<td>102 (10)</td>
<td>52</td>
<td>53.1</td>
<td></td>
</tr>
</tbody>
</table>

95% CL, 95% confidence limits; DBP, diastolic blood pressure; IV, intravenous; OR, odds ratio; PO, per os; SD, standard deviation.

“Can Not Get Medication <30-60 min”

- Work with pharmacy
- Stock on labor and delivery with emergency override
- Get *Pharmacy and Therapeutics Committee* to approve IV labetalol for use on OB floor
- Nursing and OB education for use
- Have emergency *medication box*
Emergency Medication Box for Severe Preeclampsia and Eclampsia

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose and Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium 20 grams/500 ml bag</td>
<td>IV (Use Magnesium Sulfate Continuous Infusion under L&amp;D protocol in Alaris Pump Library):</td>
</tr>
<tr>
<td></td>
<td>Initial (Loading Dose): 4-6 g (100 ml – 150 ml) over 20 minutes</td>
</tr>
<tr>
<td></td>
<td>Maintenance Dose: 1-2 g/hour (25 ml/hr – 50 ml/hr) continuous infusion</td>
</tr>
<tr>
<td>Labetalol 100mg/20ml vial</td>
<td>Initial: Draw 4 ml from the vial. 20 mg (4 ml) IV bolus followed by 40 mg (8 ml) if not</td>
</tr>
<tr>
<td></td>
<td>effective within 10 minutes; then 80 mg (16 ml) every 10 minutes (maximum total dose of 300 mg/60ml)</td>
</tr>
<tr>
<td>Hydralazine 20mg/ml vial</td>
<td>Initial: Draw 0.25 ml from the vial. 5-10 mg (0.25-0.5 ml) doses IV every 15-20 minutes</td>
</tr>
<tr>
<td>Esmolol 100mg/10ml vial</td>
<td>1-2 mg/kg (0.1-0.2 ml/kg) IV over 1 minute</td>
</tr>
<tr>
<td>(By Anesthesiologists ONLY)</td>
<td></td>
</tr>
<tr>
<td>Propofol 10mg/ml, 20ml vial</td>
<td>30-40 mg (3-4 ml) IV bolus</td>
</tr>
<tr>
<td>(By Anesthesiologists ONLY)</td>
<td></td>
</tr>
<tr>
<td>Calcium gluconate</td>
<td>1000 mg/10 ml IV over 2-5 minutes</td>
</tr>
<tr>
<td>1000 mg/10ml vial</td>
<td></td>
</tr>
<tr>
<td>Labetalol 200 mg tablets</td>
<td>200 mg PO and repeated in 30 minutes if needed</td>
</tr>
<tr>
<td>Nifedipine 10 mg PO</td>
<td>10 mg PO and repeated in 30 minutes if needed</td>
</tr>
<tr>
<td>Supply contents</td>
<td>3 ml, 10 ml, and 20 ml syringes, appropriate needles and appropriate tubing sets</td>
</tr>
</tbody>
</table>

Kindly used with permission of Stanford University Medical Center and Gillian Hilton, MD 2013
“Competing Priorities”

- Verify BP
- IV access
- Labs collected
- Physician notified → chain of command
- Antihypertensive medication
- Magnesium sulfate started
- Labs sent
- Imaging or other diagnostics
Postpartum Care – Delivery is The Cure (except when it’s not)

Table III. Prodromal symptoms in patients with late postpartum eclampsia

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Late postpartum eclampsia (No.*</th>
<th>Before delivery or early postpartum (No. †)</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache</td>
<td>20 (87.0%)</td>
<td>41 (62.1%)</td>
<td>4.1 (1.1, 15.1)</td>
</tr>
<tr>
<td>Visual symptoms</td>
<td>10 (43.5%)</td>
<td>15 (22.7%)</td>
<td>2.6 (1.0, 7.2)</td>
</tr>
<tr>
<td>Nausea or vomiting</td>
<td>5 (21.7%)</td>
<td>17 (25.8%)</td>
<td>0.8 (0.3, 2.5)</td>
</tr>
<tr>
<td>Epigastric pain</td>
<td>2 (8.7%)</td>
<td>9 (13.6%)</td>
<td>0.6 (0.1, 3.0)</td>
</tr>
<tr>
<td>At least 1</td>
<td>21 (91.3%)</td>
<td>46 (69.7%)</td>
<td>4.6 (1.0, 21.4)</td>
</tr>
</tbody>
</table>

*n = 23.
†n = 66.

• 91% had at least 1 prodromal symptom
• 52% had more than one prodromal symptom
• 100% had headache or visual symptoms
• Only 33% (7/21) sought care for their symptoms

AUTHOR’S CONCLUSION: “...efforts should be directed to the education of the health care providers and patients regarding the importance of prompt reporting and evaluation of symptoms of preeclampsia during the postpartum period.”

Late Postpartum Eclampsia

- >48 hours following delivery, up to 6 weeks PP
- Accounts for approximately 15% of cases of eclampsia
- 63% 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, which occurred in about 70% of patients; other prodromal symptoms included shortness of breath, blurry vision, nausea or vomiting, edema, neurological deficit, and epigastric pain

Postpartum/ discharge protocols should include:

- Management and verification of postpartum follow-up & BP check within 7 to 10 days post-discharge
- Standardize discharge patient education for women with preeclampsia and/or severe range HTN
- Discharge instructions to include warning signs of preeclampsia for ALL postpartum patients
Materials for Prenatal & Postpartum Patient Education

Preeclampsia

What Is It?
Preeclampsia is a serious disease related to high blood pressure. It can happen to any pregnant woman.

Risks to You
- Seizures
- Stroke
- Organ damage
- Death

Risks to Your Baby
- Premature birth
- Death

Signs of Preeclampsia
- Stomach pain
- Headaches
- Feeling nauseous; throwing up
- Seeing spots
- Swelling in your hands and face
- Gaining more than 5 pounds in a week

What Should You Do?
Call your doctor right away. Finding preeclampsia early is important for you and your baby.

More information go to www.preeclampsia.org


“7 Symptoms Every Pregnant Woman Should Know” video available in English and Spanish on YouTube.
**Postpartum Preeclampsia Checklist**

**If Patient < 6 Weeks Postpartum with:**
- BP ≥ 160/110 or
- BP ≥ 140/90 with unremitting headache, visual disturbances, epigastric pain

- [ ] Call for Assistance
- [ ] Designate:
  - Team leader
  - Checklist reader/recorder
  - Primary RN
- [ ] Ensure side rails up
- [ ] Call obstetric consult; Document call
- [ ] Place IV; Draw preeclampsia labs
  - CBC
  - Chemistry Panel
  - PT
  - Uric Acid
  - PTT
  - Hepatic Function
  - Fibrinogen
  - Type and Screen
- [ ] Administer seizure prophylaxis
- [ ] Administer antihypertensive therapy
  - Contact MFM or Critical Care for refractory blood pressure
- [ ] Consider indwelling urinary catheter
  - Maintain strict I&O - patient at risk for pulmonary edema
- [ ] Brain imaging if unremitting headache or neurological symptoms

**Magnesium Sulfate**
- Contraindications: pulmonary edema, renal failure, myasthenia gravis
- IV access:
  - [ ] Load 4-6 grams 10% magnesium sulfate in 100 mL solution over 20 min
  - [ ] Label magnesium sulfate; Connect to labeled infusion pump
  - [ ] Magnesium sulfate maintenance 1-2 grams/hour

**No IV access:**
- [ ] 10 grams of 50% solution IM (5 g in each buttock)

**Antihypertensive Medications**
- For SBP ≥ 160 or DBP ≥ 110
  - [ ] Labetalol (20 mg, 40, 80 IV* over 2 min, escalating doses, repeat q 10 min; Avoid in asthma or heart failure
  - [ ] Hydralazine (5-10 mg IV* over 2 min, repeat q 20 min until target BP reached)
  - [ ] Oral Nifedipine (10, 20, 40 mg capsules; repeat BP q 20 min until target BP reached); Capsules should be administered orally, not punctured or otherwise administered sublingually

  * Maximum cumulative IV-administered doses should not exceed 220 mg labetalol or 25 mg hydralazine in 24 hours

**Note:** If first line agents unsuccessful, emergency consult with specialist (MFM, internal medicine, OB anesthesiology, critical care) is recommended

**Anticonvulsant Medications**
- For recurrent seizures or when magnesium sulfate contraindicated
  - [ ] Lorazepam (Ativan): 2-4 mg IV x 1, may repeat once after 10-15 min
  - [ ] Diazepam (Valium): 5-10 mg IV q 5-10 min

- [ ] Call for assistance
- [ ] Designate team leader, checklist reader, primary RN
- [ ] Ensure side rails up
- [ ] Call OB consult; Document call
- [ ] Place IV; Draw PEC labs
- [ ] Administer seizure prophylaxis
- [ ] Administer antihypertensive therapy
- [ ] Consider indwelling urinary catheter. Maintain strict I&O
- [ ] Brain imaging if unremitting headache or neurological symptoms

**ACOG**

District II
Timely Response Matters!

1. Process for timely triage and evaluation of pregnant and postpartum women with hypertension, reduce time to treatment for severe range BP.

2. Include emergency department and outpatient

3. Rapid access to medications used for severe hypertension: medications should be stocked and immediately available. Include brief guide for administration & dosage.

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

5. Emergency protocols – Eclampsia management, HTN treatment algorithms
Key Elements of Bundles for Hypertensive Patients

• Staff education and correct BP measurement
• Notify the physician if BP >155/105 mmHg*
• Standardized treatment of BP within 1 hr if >160/110 mmHg
• Uniform policy for use of MgSO₄ for Preeclampsia Severe Features (includes new onset severe Maternal HTN) and should be consider in patients with preeclampsia
• Early postpartum follow-up (3-14 days) if diagnosis of hypertension
• Standardized patient educational materials
Appropriate Preeclampsia Evaluation
Patients presenting with vague symptoms of:

- headache
- abdominal pain
- shortness of breath
- generalized swelling
- complaints of “I just don’t feel right”

should be evaluated for atypical presentations of preeclampsia or “severe features”

ACOG Executive Summary on Hypertension In Pregnancy, Nov 2013

1. The term “mild” preeclampsia is discouraged for clinical classification. The recommended terminology is:
   a. “preeclampsia without severe features” (mild)
   b. “preeclampsia with severe features” (severe)

2. Proteinuria is not a requirement to diagnose preeclampsia with new onset hypertension.

3. The total amount of proteinuria > 5g in 24 hours has been eliminated from the diagnosis of severe preeclampsia.

4. Early treatment of severe hypertension is mandatory at the threshold levels of 160 mm Hg systolic or 110 mm Hg diastolic.

5. Magnesium sulfate for seizure prophylaxis is indicated for preeclampsia with severe features and should not be administered universally for preeclampsia without severe features (mild).
6. Preeclampsia with onset prior to 34 weeks is most often severe and should be managed at a facility with appropriate resources for management of serious maternal and neonatal complications.

7. Induction of labor at 37 weeks is indicated for preeclampsia and gestational hypertension.

8. The postpartum period is potentially dangerous. Patient education for early detection during and after pregnancy is important.

9. Long-term health effects should be discussed.
Proteinuria

- 300 mg in a 24 hour period or
- Protein/creatinine ratio 0.3 (mg/dL/mg/dL)
- 1+ or more proteinuria by dipstick if above are not available
- The old 5 grams of protein has gone away. The amount of proteinuria does not correlate with outcome, or guide therapy
- Proteinuria is not a requirement to diagnose preeclampsia with new onset severe hypertension.
• Induction of labor at 37 weeks is indicated for preeclampsia and gestational hypertension.
When to Deliver

- Chronic Hypertension
  - With no additional maternal or fetal complications, delivery before 38 0/7 weeks not recommended
  - With superimposed preeclampsia, follow preeclampsia recommendations

- Preeclampsia/Gestational Hypertension
  - Without severe features:
    - May expectantly manage until severe features present or 37 0/7 weeks
  - With Severe Features
    - Prior to viability - deliver
    - May expectantly manage in appropriate setting until 34 weeks gestation, if maternal and fetal status stable

Key Clinical Pearl

In patients with preterm preeclampsia with severe features, the disease can rapidly progress to significant maternal morbidity and/or mortality.

*Transfer to appropriate level of care if possible*
Indications for Delivery

• 34 weeks gestation if severe features OR
• Any of the following:
  • Uncontrolled hypertension despite therapy
  • Recurrent symptoms such as headache, visual changes, RUQ pain
  • Pulmonary edema
  • Significant renal or hepatic dysfunction
  • HELLP Syndrome or Disseminated Intravascular Coagulation
  • Eclampsia
  • Abruptio placenta
  • Non reassuring fetal status: growth restriction, oligohydramnios, or abnormal fetal testing
Postpartum Attention

• Patient education for early detection of signs and symptoms of preeclampsia *during* and *after* pregnancy is important.

• Standard follow up of all hypertension patients in the first 7-10 days postpartum for BP check.

• Long-term health effects of preeclampsia, including increased risks of cardiovascular disorders, should be discussed.
Facility-wide standard protocols with checklists and escalation policies for management and treatment of:

- Severe range hypertension (ACOG treatment algorithms for IV therapy as soon as possible)
- Eclampsia, seizure prophylaxis, and mag over-dosage
- Postpartum presentation of severe hypertension/preeclampsia
Hypertensive Emergency Checklist

Hypertensive Emergency:
- Two severe BP values (≥160/110) taken 15-60 minutes apart. Values do not need to be consecutive.
- May treat within 15 minutes if clinically indicated

☐ Call for Assistance
☐ Designate:
  ○ Team leader
  ○ Checklist reader/recorder
  ○ Primary RN
☐ Ensure side rails are up
☐ Administer seizure prophylaxis (magnesium sulfate first line agent, unless contraindicated)
☐ Antihypertensive therapy within 1 hour for persistent severe range BP
☐ Place IV; Draw preeclampsia labs
☐ Antenatal corticosteroids (if <34 weeks of gestation)
☐ Re-address VTE prophylaxis requirement
☐ Place indwelling urinary catheter
☐ Brain imaging if unremitting headache or neurological symptoms
☐ Debrief patient, family, and obstetric team

Magnesium Sulfate
Contraindications: pulmonary edema, renal failure, myasthenia gravis

☐ IV access:
  □ Load 4-6 grams 10% magnesium sulfate in 100 mL solution over 20 min
  □ Label magnesium sulfate; Connect to labeled infusion pump
  □ Magnesium sulfate maintenance 1-2 grams/hour

☐ No IV access:
  □ 10 grams of 50% solution IM (5 g in each buttock)

Antihypertensive Medications
For SBP ≥ 160 or DBP ≥ 110

☐ Labetalol (20 mg, 40, 80 IV* over 2 min, escalating doses, repeat q 10 min); Avoid in asthma or heart failure
☐ Hydralazine (5-10 mg IV* over 2 min, repeat q 20 min until target BP reached)
☐ Oral Nifedipine (10, 20, 40 mg capsules; repeat BP q 20 min until target BP reached); Capsules should be administered orally, not punctured or otherwise administered sublingually

* Maximum cumulative IV-administered doses should not exceed 220 mg labetalol or 25 mg hydralazine in 24 hours

Note: If first line agents unsuccessful, emergency consult with specialist (MFM, Internal medicine, OB anesthesiology, critical care) is recommended

Anticonvulsant Medications
For recurrent seizures or when magnesium sulfate contraindicated

☐ Lorazepam (Ativan): 2-4 mg IV q 1 h, may repeat once after 10-15 min
☐ Diazepam (Valium): 5-10 mg IV q 5-10 min to maximum dose 30 mg

☑ Call for assistance
☑ Designate team leader, checklist reader, primary RN
☑ Ensure side rails are up
☑ Administer seizure prophylaxis
☑ Antihypertensive therapy within 1 hr for persistent severe range BP
☑ Place IV; Draw PEC labs
☑ Antenatal corticosteroids is <34 wks gestation
☑ Re-address VTE prophylaxis requirement
☑ Place indwelling urinary catheter
☑ Brain imaging if unremitting headache or neurological symptoms
☑ Debrief patient, family, OB team
Eclampsia Checklist

☐ Call for Assistance
☐ Designate
  ○ Team leader
  ○ Checklist reader/recorder
  ○ Primary RN
☐ Ensure side rails up
☐ Protect airway and improve oxygenation:
  ○ Maternal pulse oximetry
  ○ Supplemental oxygen (100% non-rebreather)
    □ Lateral decubitus position
    □ Bag-mask ventilation available
    □ Suction available
☐ Continuous fetal monitoring
☐ Place IV; Draw preeclampsia labs
☐ Administer magnesium sulfate
☐ Administer antihypertensive therapy if appropriate
☐ Develop delivery plan, if appropriate
☐ Debrief patient, family, and obstetric team

**MAGNESIUM SULFATE**
Contraindications: pulmonary edema, renal failure, myasthenia gravis

IV access:
☐ Load 4-6 grams 10% magnesium sulfate in 100 mL solution over 20 min
☐ Label magnesium sulfate; Connect to labeled infusion pump
☐ Magnesium sulfate maintenance 1-2 grams/hour

No IV access:
☐ 10 grams of 50% solution IM (5 g in each buttock)

**ANTIHYPERTENSIVE MEDICATIONS**
For SBP ≥ 160 or DBP ≥ 110
☐ Labetalol (20 mg, 40, 80 IV* over 2 min, escalating doses, repeat q 10 min); Avoid in asthma or heart failure, can cause neonatal bradycardia
☐ Hydralazine (5-10 mg IV* over 2 min, repeat q 20 min until target BP reached)
  * Maximum cumulative IV-administered doses should not exceed 220 mg labetalol or 25 mg hydralazine in 24 hours
Note: If persistent seizures, consider anticonvulsant medications and additional workup

**ANTICONVULSANT MEDICATIONS**
For recurrent seizures or when magnesium sulfate contraindicated
☐ Lorazepam (Ativan): 2-4 mg IV x 1, may repeat once after 10-15 min
☐ Diazepam (Valium): 5-10 mg IV q 5-10 min to maximum dose 30 mg

**FOR PERSISTENT SEIZURES**
☐ Neuromuscular block and intubate
☐ Obtain radiographic imaging
☐ ICU admission
☐ Consider anticonvulsant medications
**Postpartum Preeclampsia Checklist**

**IF PATIENT < 6 WEEKS POSTPARTUM WITH:**

- BP ≥ 160/110 or
- BP ≥ 140/90 with unrelenting headache, visual disturbances, epigastric pain

- Call for assistance
- Designate:
  - Team leader
  - Checklist reader/recorder
  - Primary RN
- Ensure side rails up
- Call obstetric consult; Document call
- Place IV; Draw preeclampsia labs
  - CBC
  - Chemistry Panel
  - PT
  - Uric Acid
  - PTT
  - Hepatic Function
  - Fibrinogen
  - Type and Screen
- Administer seizure prophylaxis
- Administer antihypertensive therapy
  - Contact MFM or Critical Care for refractory blood pressure
- Consider indwelling urinary catheter
  - Maintain strict I&O - patient at risk for pulmonary edema
- Brain imaging if unrelenting headache or neurological symptoms

**MAGNESIUM SULFATE**

Contraindications: pulmonary edema, renal failure, myasthenia gravis

**IV access:**
- Load 4-6 grams 10% magnesium sulfate in 100 mL solution over 20 min
- Label magnesium sulfate; Connect to labeled infusion pump
- Magnesium sulfate maintenance 1-2 grams/hour

**No IV access:**
- 10 grams of 50% solution IM (5 g in each buttock)

**ANTIHYPERTENSIVE MEDICATIONS**

For SBP ≥ 160 or DBP ≥ 110

- **Labetalol** (20 mg, 40, 80 IV* over 2 min, escalating doses, repeat q 10 min); Avoid in asthma or heart failure
- **Hydralazine** (5-10 mg IV* over 2 min, repeat q 20 min until target BP reached)
- **Oral Nifedipine** (10, 20, 40 mg capsules; repeat BP q 20 min until target BP reached); Capsules should be administered orally, not punctured or otherwise administered sublingually

* Maximum cumulative IV-administered doses should not exceed 220 mg labetalol or 25 mg hydralazine in 24 hours

**Note:** If first line agents unsuccessful, emergency consult with specialist (MFM, internal medicine, OB anesthesiology, critical care) is recommended

**ANTICONVULSANT MEDICATIONS**

For recurrent seizures or when magnesium sulfate contraindicated

- **Lorazepam (Ativan):** 2-4 mg IV x 1, may repeat once after 10-15 min
- **Diazepam (Valium):** 5-10 mg IV q 5-10 min
Key Clinical Pearl

- Use of preeclampsia-specific checklists, team training and communication strategies, and continuous process improvement strategies will likely reduce hypertensive related morbidity.

- Use of patient education strategies, targeted to the educational level of the patients, is essential for increasing patient awareness of signs and symptoms of preeclampsia.
ILPQC Maternal HTN Initiative

Jan 2016-Dec 2017
ILPQC HTN Initiative
Goal & Measures

Goal: Reduce preeclampsia maternal morbidity

<table>
<thead>
<tr>
<th>IL Measure</th>
<th>Type</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Severe Maternal Morbidity</strong></td>
<td>Outcome</td>
<td>20% reduction</td>
</tr>
<tr>
<td>No. of women with severe maternal morbidities (e.g. Acute renal failure,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARDS, Pulmonary Edema, Puerperal CNS Disorder such as Seizure, DIC,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ventilation, Abruption) / No. pregnant &amp; postpartum women with new onset</td>
<td></td>
<td></td>
</tr>
<tr>
<td>severe range HTN</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Appropriate Medical Management in under 60 minutes</strong></td>
<td>Process</td>
<td>100%</td>
</tr>
<tr>
<td>No. of women treated at different time points (30,60,90, &gt;90 min) after</td>
<td></td>
<td></td>
</tr>
<tr>
<td>elevated BP is confirmed / No. of women with new onset severe range HTN</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em><em>Debriefs on all new onset severe range HTN</em> cases</em>*</td>
<td>Process</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Discharge education and follow-up</strong> within 10 days for all women with</td>
<td>Process</td>
<td>100%</td>
</tr>
<tr>
<td>severe range HTN, 72 hours with all women with severe range HTN on</td>
<td></td>
<td></td>
</tr>
<tr>
<td>medications</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Severe range HTN: ≥160 systolic / ≥110(105) diastolic per hospital standard

*New onset severe range HTN: first episode of persistent severe range HTN (lasting >15 minutes) in a hospitalization (ER, L&D, or other inpatient setting), can be chronic HTN, gestational HTN, preeclampsia and/or postpartum diagnosis.
Key components for success

- Early recognition of hypertension / preeclampsia triggers during pregnancy and postpartum period
- **Reduce time to treatment of severe range blood pressure, 160/110(105)**
- Provide patient education and appropriate discharge follow up
- Implementation of evidence based protocols
  - Management of severe HTN, preeclampsia triggers, magnesium, expectant management vs delivery, postpartum management, eclampsia
Baseline was Retrospective
The rate of eclampsia decreased from 1.21/1000 at baseline to 0.65/1000 during 2016, $p<0.001$. 
**Maternal Hypertension Data: Time to Treatment**

**ILPQC: Maternal Hypertension Initiative**

Percent of All Reporting Hospitals that Treated Cases with New Onset Severe Hypertension within 60 Minutes

All Hospitals, 2016-2017

*September has 60 teams reporting this metric*
Maternal Hypertension Data:
Patient Education

ILPQC: Maternal Hypertension Initiative
Percent of All Reporting Hospitals Where Women Received Discharge Education Materials
All Hospitals, 2016-2017

*September has 60 teams reporting this metric

- 75-100% of women received discharge materials
- 1-74% of women received discharge materials
- No women received discharge materials

Overall % Received Materials at Discharge
Maternal Hypertension Data: Patient Follow-up

ILPQC: Maternal Hypertension Initiative
Percent of All Reporting Hospitals Where Follow-up Appointments were Scheduled within 10 Days
All Hospitals, 2016-2017

*September has 60 teams reporting this metric

- 75-100% of women with follow up
- 1-74% of women with follow up
- No women with follow up
- Overall % With Follow Up
Maternal Hypertension Data: Debrief

ILPQC: Maternal Hypertension Initiative
Percent of All Reporting Hospitals Where Cases of New Onset Severe Hypertension were Debriefed
All Hospitals, 2016-2017

*September has 60 teams reporting this metric
Role of Nurses and Staff

• Know best practices for accurate blood pressure management
• Identify severe range BP $\geq 160/105-110$, notify provider and repeat with in 15 minutes.
• If repeat BP remains elevated, notify provider of BP and need to activate severe range BP treatment protocol for IV therapy
• Have easy access to protocol / order set to ensure correct intervals for repeating BP and redose medications.
• Systems in place for easy rapid access to medications
• Follow protocols to start Magnesium for seizure prevention
• Ensure all patients with hypertension have appropriate follow up with in 7-10 days, if home on meds f/u 72 hours for BP.
• Ensure all patients are given standard education on postpartum preeclampsia
• Remember to Debrief “How did we do on Time to Treatment?”
Role of OB providers

- If notified of severe range BP
  - Follow ACOG treatment guidelines for IV therapy and BP reassessment and escalation of therapy
  - Goal is therapy ASAP within 30-60 minutes of confirmed elevated BP
  - Magnesium for seizure prevention for new onset severe HTN
  - Determine need for immediate evaluation
  - Participate in Debrief with nurse (How did we do on Time to Treatment? Any barriers? What went well?)
Role of OB Providers

• Discharge Management
  • All postpartum patients with gest HTN / preeclampsia need early postpartum follow up within 7-10 days to evaluate BP
  • For patients on BP medication consider follow up within 72 hours to confirm BP controlled
  • Standardize preeclampsia education for prenatal and postpartum patients
Conclusion

• Systolic BP $\geq 160$ or diastolic BP $\geq 110(105)$ warrant:
  • Prompt evaluation at bedside
  • Treatment to decrease maternal morbidity and mortality
• Risk reduction and successful clinical outcomes require avoidance/management of severe systolic and diastolic hypertension in pregnant and postpartum women.
• Increasing evidence indicates that standardization of care improves patient outcomes
Additional Resources

• Preeclampsia Foundation tools and materials
  • www.preeclampsia.org

• California Maternal Quality Care Collaborative
  • www.CMQCC.org

• Patient safety bundles and AIM program information
  • www.safehealthcareforeverywoman.org

• ACOG DII (New York) Safe Motherhood Initiative
  • https://www.acog.org/About-ACOG/ACOG-Districts/District-II/Safe-Motherhood-Initiative

• Illinois Perinatal Quality Collaborative (ILPQC)
  • www.ilpqc.org
References


Maurice L. Druzin, MD; Laurence E. Shields, MD; Nancy L. Peterson, RNC, PNP, 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.


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