Telehealth for Postpartum Hypertension
WAPC Annual Meeting
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April 23rd, 2018

Disclosure
I have no disclosures to report

Objectives
• Epidemiology of pregnancy and postpartum related hypertension
• Historical prospective of hypertension throughout pregnancy and postpartum
• Health care burden/cost of postpartum hypertension
• Treatment guidelines/options for hypertension postpartum
• Innovative strategies and experience with telehealth for treatment of postpartum hypertension at UnityPoint Health-Meriter

US-Hypertension disorders in pregnancy
• Almost 10% of pregnancies are affected by hypertension related disorders in the United States.¹

Wisconsin- Hypertension in pregnancy
• Hypertensive disorders affect approximately 22% of pregnancies in Wisconsin.²

Chronic hypertension in US

Preeclampsia

- 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

Postpartum hypertension

- Exact incidence is unknown
- Seventy-five percent of deaths secondary to gestational hypertensive disorders occur after birth, with 41% in one study occurring more than 48 hours postpartum.¹
- Up to half of women eventually diagnosed with postpartum preeclampsia were not diagnosed with preeclampsia in the antepartum or immediate peripartum period.²

Risk of long-term cardiovascular disease


Historical perspectives: pregnancy & postpartum hypertension

History of hypertensive disorders of pregnancy

- Late 5th and early 4th century BC: Hippocrates subscribed to the theory of the four humors to describe illness and disease. Women were considered wet while men were considered dry. “Because a woman’s flesh was porous and soft, she was at risk of drawing in too much moisture, resulting in an overabundance of fluids (humors) and subsequent illness.”
- 2000 BC: The Kahun Papyrus - Egypt
  - The wandering womb
  - References to eclampsia
- 400 BC: “A headache accompanied by heaviness and convulsions during pregnancy is considered bad” (Hippocrates).

Medical pioneers

- 1619: “Eclampsia” first appeared in Varandaeus’ treatise on gynecology
- 1739: Bossier de Sauvages differentiated seizures of eclampsia from epilepsy
- 1840: Pierre Rayer discovered protein in the urine
- 1843: John Lever demonstrated proteinuria was specific to preeclampsia and not another kidney ailment, “toxemia”
- Mid 1800’s: hallmark prodromal symptoms of preeclampsia were recognized
- 1872: A survey found 25% of maternal deaths were due to eclampsia and doctors began to induce labor to “cure” preeclampsia
- 1896: Scipione Riva-Rocci’s mercury manometer for blood pressure measurement led to recognition of preeclampsia as a hypertensive disorder
Timeline: Diagnosis and treatment
- Middle ages -> 1800’s blood-letting and opiates
- 1906 – Horn was first to use magnesium sulfate to prevent eclampsia
- 1972 – 1st ACOG hypertension in pregnancy classification
- 1987 – Postpartum BP studies published
- 1990 – Controlled studies demonstrated superiority of magnesium sulfate over other anticonvulsants to prevent eclampsia
- No major changes to prenatal care or diagnosis of preeclampsia since 1960’s
- 2013 – Classification of hypertension in pregnancy updated by ACOG

Hypertension in pregnancy initiatives
- National focus on Hypertension in Pregnancy/Readmission
  - 2013 ACOG Executive Summary – Hypertension in Pregnancy
  - California Collaborative- Preeclampsia taskforce (2014)
  - Council on Patient Safety in Women’s Health Care
  - AIM = Alliance for Innovation on Maternal Health
  - Development and rollout of evidenced based patient safety bundles
  - Severe Hypertension in Pregnancy Bundle (2015)
  - WisPQC hypertension initiative (2015/16)

Healthcare burden/cost

US hospital readmission

2015 post-partum readmissions Q1-3

Healthcare cost of postpartum readmission

- **2013-14**
- **6.3 million delivery hospitalizations**
- **10.6% complicated by hypertension diagnoses of pregnancy (HDP)**
- HDP related hospital readmission ranged from 2.5-4.6%
- Compared with normotensive pregnancies, HDP resulted in an excess 404,800 hospital days and inpatient care costs of $731 million.


**Strategies to reduce avoidable maternal readmission**

**During hospitalization:**
- Risk screen patients and tailor care
- Establish communication with PCP, family, home care
- Use “teach-back” to educate patient/caregiver about diagnosis and care
- Coordinate patient care across multidisciplinary team


**Strategies to reduce avoidable maternal readmission**

**At discharge:**
- Implement comprehensive discharge planning
- Educate patient/caregiver using “teach-back”
  - Blood pressure monitoring for hypertensive OB patients
  - Signs & symptoms of pre-eclampsia
- Hand hygiene
- Medications
- Schedule & prepare for follow-up appointment


**Hospital readmission for CV event within 3 years of delivery**

**OBJECTIVE:**
Women with pregnancies complicated by hypertensive disorders of pregnancy (HDP) have increased long-term cardiovascular (CV) risk. We sought to determine if they demonstrate increased short-term CV risk.

- **FLORIDA:** 2004-2010
- **READMISSION WITHIN 3 YEARS OF INDEX DELIVERY**
- **INCLUSION:** Gestational hypertension, preeclampsia, or eclampsia
- **OUTCOME:** CV readmission (acute MI, stroke or heart failure)

**RESULTS:**
- 1,452,926 records from delivering mothers of singleton infants (mean age 27.2 ± 6.2 years; 52% white, 23% African American (AA), 18% Hispanic)
- 4,054 CV and 2,522 non-CV readmissions.
- Women with HDP had higher CV readmission rates (6.4 vs 2.5/1000 deliveries; P<0.001). AA women had higher rates of CV readmission than whites or Hispanics (6.8 vs 1.7 vs 1.0/1000 deliveries, respectively; P<0.001). Women with HDP had higher readmission risk for CV readmission (OR 2.41; 95% CI 2.08 to 2.80) and any readmission (OR 1.13; 95% CI 1.10 to 1.15). Compared with whites, AA women had higher risk for CV readmission (OR 3.60; 95% CI 3.32 to 3.90) after adjustment for HDP.

**CONCLUSION:**
Women with HDP had twice the risk of CV readmission within 3 years of delivery, with higher rates among AA women. More work is needed to explore preventive strategies for HDP-associated events.


**Discharge education**

- Blood pressure monitoring for hypertensive OB patients
- Signs & symptoms of pre-eclampsia
- Hand hygiene
- Medications
- Schedule & prepare for follow-up appointment

Strategies to Reduce Avoidable Maternal Readmission

- Post-discharge
- Promote self-management
- Conduct patient home visit
- Follow-up with patient via telephone


Duration of hospital stay/follow-up: ACOG

- “For women in whom gestational hypertension, preeclampsia, or superimposed preeclampsia is diagnosed, it is suggested that BP be monitored in the hospital or that equivalent outpatient surveillance be performed for at least 72 hours postpartum and again 7-10 days after delivery or earlier in women with symptoms

Quality of evidence: Moderate

Postpartum hypertension: To treat or not to treat?

Postpartum hypertension

- Can be related to persistence of....
  - Gestational hypertension
  - Preeclampsia
  - Preexisting chronic hypertension
  - De novo secondary to other causes

Physiologic changes in pregnancy

Physiologic changes postpartum

- Normotensive women had both SBP (6mmHg) and DBP (4mmHg) that rose for the 1st 4 days after delivery.1
  - 12% had DBP that was >100mmHg

- In women with preeclampsia there is a decrease in BP within 48 hours of delivery, but BP increases again between 3-6 days postpartum.2,3,4

What blood pressure values warrant treatment postpartum?

- The current ACOG guidelines are based upon expert opinion rather than experimental data and recommend treating postpartum hypertension at a systolic blood pressure (SBP) of >150 or diastolic blood pressure (DBP) of >100. 1-3


Timeline for hypertension follow-up?

- Because maternal blood pressure has been shown to decrease for the first 48 hours and then increase with a peak 3–6 days after birth for a woman with preeclampsia during the postpartum period, peak blood pressures are likely to occur after most women have been discharged home.
- Thus, checking maternal postpartum blood pressure within the first 7–10 days postpartum is recommended for women with preeclampsia or hypertensive disorders to determine whether there is a need for further evaluation and treatment.
Evaluation and management of postpartum hypertension, Sibai 2012

Prevention and treatment of postpartum hypertension

- Objective: To assess the relative benefits and risks of interventions to:
  - Prevent postpartum hypertension, by assessing whether "routine" postpartum medical therapy is better than placebo/no treatment
  - and-
  - Treat postpartum hypertension by assessing whether
    - (i) one antihypertensive therapy is better than placebo/no therapy for mild-moderate postpartum hypertension; and
    - (ii) one antihypertensive agent offers advantages over another for mild-moderate or severe postpartum hypertension.

Magee L. Prevention and treatment of postpartum hypertension. 2013

Results

- Prevention
  - 4 trials (358 women) compared furosemide, nifedipine, or L-arginine with placebo/no therapy.
  - Women with antenatal preeclampsia

Postnatal furosemide is associated with a strong trend towards reduced use of antihypertensive therapy in hospital.

- Treatment
  - Mild-moderate postpartum hypertension, 3 trials (189 women) compared timolol, hydralazine, or nifedipine, with methyldopa.
    - Use of additional antihypertensive therapy did not differ between groups (RR 0.92, 95% CI 0.20-4.20)
    - Drugs were tolerated
  - Severe hypertension, 2 trials (120 women) compared hydralazine IV with nifedipine SL or labetalol IV.
    - No maternal deaths or hypotension
    - Use of additional antihypertensive therapy did not differ between groups (RR 0.58, 95% CI 0.04-9.07)

Conclusions

- There are no reliable data to guide management of women who are hypertensive postpartum.
- Any hypertensive agent used should be based on a clinician's familiarity with the drug.
- Future studies should include data on postpartum analgesics, severe maternal hypertension, breastfeeding, hospital length of stay and maternal satisfaction with care.

Can we do better?
Historical perspectives: Remote patient monitoring & telehealth

Telemedicine vs Telehealth

- Telehealth and telemedicine are sometimes used interchangeably
- Do they mean the same thing?
  - Considerable debate
- Telemedicine:
  - The clinical application of technology
- Telehealth:
  - Encompasses a broader, consumer-facing approach: “a collection of means or methods, not a specific clinical service, to enhance care delivery and education.”

Telehealth applications defined

- Live (synchronous) videoconferencing: a two-way audiovisual link between a patient and a care provider
- Store-and-forward (asynchronous) videoconferencing: transmission of a recorded health history to a health practitioner, usually a specialist.
- Remote patient monitoring (RPM): the use of connected electronic tools to record personal health and medical data in one location for review by a provider in another location, usually at a different time.
- Mobile health (mHealth): health care and public health information provided through mobile devices. The information may include general educational information, targeted texts, and notifications about disease outbreaks.

Remote patient monitoring

- The use of digital technologies to collect medical and other forms of health data from individuals in one location and electronically transmit that information securely to health care providers in a different location for assessment and recommendations
  - Vital signs: weight, blood pressure, blood oxygen levels, heart rate
  - Electrocardiograms
  - Blood sugar
- Benefits:
  - Keep people healthy
  - Reduce hospitalizations, readmissions and length of stay
  - Improve quality of life
  - Reduce healthcare costs

Remote patient monitoring

Types of blood pressure monitoring

- Clinic
  - Gold standard- mercury sphygmomanometers
  - Aneroid automatic
    - Observed
    - Not observed
- Home
  - Self
  - Ambulatory
    - 24 hour ambulatory

Home blood pressure monitoring

- Important to provide instruction and train patients to standardize the process at home
- A rest period prior to measurement
- Appropriate position and cuff size
- Avoidance of factors that influence blood pressure


Proper blood pressure cuff/monitor selection

**Use of the arm cuff is preferred compared to wrist and finger monitors**


Technique for HMBP monitoring

BP values

++Tend to be lower at home


Home blood pressure monitoring

- Home blood pressure monitoring has been demonstrated as a cost-effectiveness approach to hypertension treatment in non-obstetrical patients.  
- Preliminary research suggests home blood pressure monitoring in pregnancy may also be effective.


Remote patient monitoring for postpartum hypertension

Objective

To establish the feasibility of telehealth for monitoring and treatment of postpartum women at risk of sustained or development of severe hypertension (SBP>150 or DBP>100 mmHg) within 6 weeks after discharge.

Primary outcomes
- Recruitment
- Retention

Secondary outcomes
- Incidence of severe hypertension after hospital discharge, patient satisfaction, and hospital readmission rates.

Hypothesis

Our telehealth intervention will be implemented with strong fidelity, have positive patient acceptability, and demonstrate a meaningful reduction in home blood pressures and postpartum hospital readmission.

Recruitment 3/2017-7/2018

- 1414 deliveries
- 263 (19%) had a hypertension diagnosis
- 124 (47%) were willing to be approached
- 55 (44.4%) consented

Table 1. Maternal Demographic Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total Population n=55</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal age in years, m (SD)</td>
<td>32 (4.9)</td>
</tr>
<tr>
<td>Married, n (%)</td>
<td>45 (82)</td>
</tr>
<tr>
<td>Parity, Nulliparous, n (%)</td>
<td>34 (62)</td>
</tr>
<tr>
<td>Race, White, n (%)</td>
<td>51 (93)</td>
</tr>
<tr>
<td>Ethnicity, Hispanic, n (%)</td>
<td>5 (9.1)</td>
</tr>
<tr>
<td>Current tobacco use, n (%)</td>
<td>4 (7.3)</td>
</tr>
<tr>
<td>Gestational age at delivery in weeks, m (SD)</td>
<td>37 (3.1)</td>
</tr>
<tr>
<td>Mode of delivery</td>
<td></td>
</tr>
<tr>
<td>Vaginal, spontaneous or operative, n (%)</td>
<td>23 (42)</td>
</tr>
<tr>
<td>Cesarean, n (%)</td>
<td>32 (58)</td>
</tr>
<tr>
<td>Neonatal intensive care unit admission, n (%)</td>
<td>16 (29)</td>
</tr>
<tr>
<td>Type of Hypertension</td>
<td></td>
</tr>
<tr>
<td>Chronic, n (%)</td>
<td>6 (11)</td>
</tr>
<tr>
<td>Superimposed preeclampsia, n (%)</td>
<td>3 (5.5)</td>
</tr>
<tr>
<td>Gestational, n (%)</td>
<td>15 (27)</td>
</tr>
<tr>
<td>Preeclampsia, n (%)</td>
<td>34 (62)</td>
</tr>
<tr>
<td>Severe features</td>
<td>17 (31)</td>
</tr>
<tr>
<td>Inpatient NSAID use, n (%)</td>
<td>47 (85)</td>
</tr>
<tr>
<td>Postpartum day of discharge, m (SD)</td>
<td>3.2 (1.0)</td>
</tr>
<tr>
<td>Hospital discharge systolic blood pressure mmHg, m (SD)</td>
<td>134 (11)</td>
</tr>
<tr>
<td>Hospital discharge diastolic blood pressure mmHg, m (SD)</td>
<td>77 (8.9)</td>
</tr>
<tr>
<td>Antihypertensive medication at discharge, n (%)</td>
<td>22 (40)</td>
</tr>
<tr>
<td>Labetalol, n (%)</td>
<td>12 (55)</td>
</tr>
<tr>
<td>Nifedipine, n (%)</td>
<td>4 (18)</td>
</tr>
<tr>
<td>Labetalol &amp; Nifedipine, n (%)</td>
<td>6 (27)</td>
</tr>
</tbody>
</table>

Table 2. Outpatient outcomes of participants experiencing severe hypertension after hospital discharge

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total Population n=55</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe hypertension after discharge*, n (%)</td>
<td>7 (12.7)</td>
</tr>
<tr>
<td>Extent of hypertension observed, n (%)</td>
<td>3.7 (0.78)</td>
</tr>
<tr>
<td>Systolic blood pressure at discharge*, m (SD)</td>
<td>134 (11)</td>
</tr>
<tr>
<td>Diastolic blood pressure at discharge*, m (SD)</td>
<td>77 (8.9)</td>
</tr>
<tr>
<td>Total participants with increased blood pressure requiring treatment after discharge**, n (%)</td>
<td>22 (40)</td>
</tr>
<tr>
<td>1st Postpartum day blood pressure requiring treatment after discharge**, m (SD)</td>
<td>153 (9.8)</td>
</tr>
<tr>
<td>Carpometric pressure at discharge**, m (SD)</td>
<td>101 (9.7)</td>
</tr>
<tr>
<td>Total participants requiring antihypertensive medication over 42 days postpartum period, n (%)</td>
<td>33 (60)</td>
</tr>
<tr>
<td>Initiated a hypertensive medication after discharge, n (%)</td>
<td>11 (20)</td>
</tr>
<tr>
<td>Increased dosage of medications, n (%)</td>
<td>13 (24)</td>
</tr>
<tr>
<td>Total participants on antihypertensive medication at end of study, n (%)</td>
<td>33 (60)</td>
</tr>
<tr>
<td>Emergency/triage room visit, n (%)</td>
<td>6 (11)</td>
</tr>
<tr>
<td>Hospital readmission, n (%)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

**Severe hypertension defined using ACOG criteria in pregnancy: >160 mm Hg or >110 mm Hg
**Blood pressure requiring postpartum treatment defined using ACOG criteria of >150 mmHg or >100 mmHg
How satisfied were you with your telehealth experience?

Feasibility project: Summary

- N=55 patients
- Recruitment:
  - Consented: 44.4%
- Retention: 95%
- Hospital readmission: 0%
- Patient satisfaction: 86% (very or extremely)
- Total participants with increased blood pressure requiring treatment after discharge: 40%
- Severe hypertension after hospital discharge: 13%
  - Postpartum day severe hypertension occurred, mean(SD): 3.7(0.76)

Limitations

- Single site Midwestern academic institution
- Small sample size
- Limited ethnic/racial diversity

Conclusions: perspective and clinical relevance

- We demonstrated feasibility of telehealth monitoring for postpartum hypertension-related disorders.
- We observed important temporal trends in the natural history of postpartum hypertension from discharge through 6 weeks postpartum which will guide larger clinical trials.
- Telehealth monitoring is a promising outpatient treatment strategy for postpartum hypertension to reduce readmissions and decrease maternal morbidity.

Future directions

- Understanding natural time course of postpartum hypertension through 6 weeks and beyond.
- Comparing outcomes in remote patient monitoring vs. standard of care. (Current work)
- Analyzing predictors of adverse outcomes and optimal blood pressure treatment postpartum.
- Cost effectiveness analysis
- Increased transition of care to a PCP for women with persistent of chronic hypertension after the postpartum period
- Increased education on importance of long-term BP control.
Summary

- Surveillance: We can do better! Remote patient monitoring may be an answer.
- Treatment: We should feel good about using antihypertensive medications - safe and effective.
- Pain medication: NSAIDS are unlikely to routinely be the cause hypertension exacerbation.
- Persistent hypertension: We can improve strategies to improve follow-up and CV screening after 6 weeks postpartum.

Acknowledgements

Collaborators:
- Makeba Williams, MD
- Oguzhan Alagoz, PhD
- Resident/student research investigators:
  - Brenda Niu, MD
  - Anna Drewry, MD
  - Barbara Ha, MD, MPH
- Research team:
  - Jennifer Heintz, MBA
  - Julia Zella, PhD
  - Melissa Zernick, BS
- Research/Telehealth nurses:
  - Kris Fedenia, RN
  - Nicole Thomas, RN
- Perinatal Nurse Manager:
  - SueEllen Dolan, RN
- Provider groups:
  - UW OB/GYN
  - UW Midwives
  - Associated Physicians
  - Madison Women’s Health
  - Physician for Women
- Mentors:
  - Deb Ehrenthal, MD, MPH
  - Heather Johnson, MD, MS
  - Ellen Hartenbach, MD
  - Kyungmann Kim, PhD
  - Chris Sorkness, PhD
- Honeywell:
  - Linda Moore, RN
  - Diane Yetmar, BS

What is role for magnesium sulfate postpartum?

- Frequency of eclampsia in women with preeclampsia without severe features was 1.6 percent without prophylaxis versus 0.7 percent with prophylaxis.
- 21% of eclamptic seizures occur postpartum.
- Approximately 90 percent of postpartum seizures occur within one week of delivery.
- Antecedent symptoms were similar to those with antepartum and intrapartum eclampsia.
  - Most commonly a headache

Duration of postpartum magnesium therapy?

- Typically continued for 24 hours postpartum, however the timing of drug discontinuation has been arbitrary; there are no high-quality data to guide therapy.
- In most women who have preeclampsia without severe features, therapy can be safely discontinued after 12 hours.

Postpartum magnesium sulfate: RCT

SMFM abstract. Ludmir, et al.

Objective: To determine if the use of magnesium sulfate post delivery reduces the risk of eclampsia postpartum in patients with severe preeclampsia that had magnesium prior to delivery.

Methods:
- RCT, Latin America
- Non-inferiority design – 1,113 patients
- Study arms: magnesium for 24 hours or no magnesium
- Primary Outcome: Development of eclampsia within 24 hours postpartum.

Conclusion:
- In patients who received 8g of magnesium prior to delivery, 24 hours of postpartum magnesium was not associated with a reduction in incidence of eclampsia (p-value. 0.99).
- Time to ambulation and lactation were significantly decreased in those who did not receive magnesium (p-value, 0.0001).

References:

Honeymoon:
- Linda Moore, RN
- Dave Hume, BS
Magnesium sulfate postpartum

- For women in the postpartum period with new-onset hypertension associated with headache, vision changes or preeclampsia with severe features parental administration of magnesium sulfate is suggested.

Quality of evidence: Low

Is it safe to take antihypertensive medication and breastfeed?


Antihypertensive medication postpartum

Lactation and antihypertensive meds

Conclusion: The available data to date indicate that ACE inhibitors, methyldopa, beta-blockers with high protein binding and some calcium channel blockers all appear to be safe treatments of hypertension in a nursing mother.

**Methyldopa has been associated with increasing postpartum depression.**

Beardmore, et al
What about NSAIDS?
- Causes vasoconstriction, sodium and water retention.
- Use of large or frequent doses may aggravate preexisting hypertension or result in new-onset hypertension.

The Task Force on Hypertension-ACOG, 2013
- "Health care providers are reminded of the contribution of nonsteroidal anti-inflammatory agents to increased blood pressure. It is suggested that these commonly used postpartum pain relief agents be replaced by other analgesics in women with hypertension that persists more than 1 day postpartum."

SMFM abstract-Viteri, 2017
- Single center, 2013-2015
- Retrospective analysis of 324 women with preeclampsia with severe features diagnosed prior to delivery and SBP ≥140 and/or DBP≥90 at or 24 after delivery.
- 243 (75%) received puerperal NSAID treatment
- Primary endpoint: persistent hypertension (SBP ≥150 and/or DBP≥100.
  - 70% using NSAIDS
  - 73% no NSAIDS
- Conclusion: No statistical difference in primary outcome

To treat or not to treat- conclusion
- There is lack of understanding regarding the natural course of postpartum hypertension.
- There is considerable uncertainty regarding the need for antihypertensive treatment postpartum, due to the concern that patients may be unnecessarily treated if the BP normalizes and thus the management as well as patient counseling has been unguided by the literature.
- The duration of magnesium sulfate remains debatable.
- Antihypertensive medications are compatible with breastfeeding.
- Little evidence to routinely withhold NSAIDS postpartum.

Hypertension Definitions

ACOG Executive Summary-Hypertension Classification
- 2013 Updates
  - 4 main hypertension classifications
    - Preeclampsia-eclampsia
    - Chronic hypertension
    - Chronic hypertension with superimposed preeclampsia
    - Gestational hypertension
  - Removed pregnancy induced hypertension and mild preeclampsia***
ACOG Executive Summary-Modifications

- Eliminated the dependence of proteinuria to diagnose preeclampsia.
- Without proteinuria, preeclampsia is diagnosed as hypertension in association with thrombocytopenia, impaired liver function, or new renal insufficiency, pulmonary edema, a new-onset cerebral or visual disturbance.
- Gestational hypertension is BP elevation >20 weeks of gestation and absence of proteinuria.
- Chronic hypertension predates pregnancy
- Superimposed preeclampsia is chronic in association with preeclampsia

Chronic hypertension defined

Wisconsin Perinatal Quality Collaborative (WisPQC)

2015: Maternal hypertension initiative

- The aim of this initiative is to increase the number of providers (defined as hospitals or health systems) who use evidence-based protocols for screening and managing women with hypertension in the antepartum, intrapartum, and postpartum period.
- WisPQC accomplished this aim through the 2015 Regional Forum Series.

Wisconsin Perinatal Quality Collaborative (WisPQC)

2016

- Cohort I (2016) focused on 4 quality measures:
  - Maternal length of stay*
  - Consumer education*
  - NICU admission/transfer
  - Provider education

Wisconsin Perinatal Quality Collaborative (WisPQC)

2016

- Cohort II (2016) focused on 7 quality measures:
  - Maternal length of stay*
  - Consumer education*
  - NICU admission/transfer
  - Low-dose aspirin with maternal risk factors
  - Appropriate medical management in less than 60 minutes*
  - Debriefs for severe range hypertension
  - Severe maternal morbidity

Wisconsin Perinatal Quality Collaborative (WisPQC)

Maternal hypertension initiative

- Data from this initiative can inform future policies, practices and quality improvement/research initiatives
- Policy
  - Implementation of ACOG and USPSTF recommendations have the potential to
    - Promptly identify maternal HTN
    - Provide appropriate treatment
    - Provide vigilant and continuing care postpartum → subsequent pregnancies
- Practice
  - Changes provide the potential to impact maternal and newborn care
- QI/research
  - Ease of access and availability of PeriData.Net® reports for hospitals make these efforts possible
  - Opportunities to increase capacity?
How is WI doing after WisPQC initiative?

- Postpartum length of stay
  - Any hypertension (excluding chronic): Minimal hospital stay of 72 hours was achieved for 38% of women, only 13% amongst vaginal deliveries.
  - Preeclampsia with severe features + VD: 39%
  - Superimposed preeclampsia with severe features + VD: 63%
- Management of severe hypertension (hypertensive emergencies)

Goals of treatment for chronic hypertension

Blood Pressure Profile 1 Year After Severe Preeclampsia Novelty and Significance