Safety Action Series

Implementing the Severe Hypertension in Pregnancy Bundle
Speakers

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Disclosures

- Evelyn Radichel MS, RN-BC has no real or perceived conflicts of interest.

- Sarosh Rana, MD, MPH, FACOG has no real or perceived conflicts of interest.
Objectives

- Review important steps in monitoring and managing hypertension during different stages of pregnancy
- Identify effective strategies for implementing the hypertension bundle on an institutional level while still optimizing patient-centered care
- Present successful outcomes and how to approach implementation barriers
- Introduce Systematic Treatment and Management of Postpartum Hypertension
  - Understand barriers for treatment of postpartum hypertension
  - Discuss how to standardize management of postpartum hypertension and readmission
The Landscape of Perinatal Care
In Oklahoma

49 birthing hospitals
• 58% rural
• 42% urban

~50,500 annual births
• 69% in urban hospitals
• 31% in rural hospitals
• From ~40–4100 annual births
• ~50% covered by Medicaid
Maternal Mortality Ratio

- Healthy People 2020 Goal = 11.4

- 2015-2017 Oklahoma Maternal Mortality Ratio* for maternal deaths within 42 days of termination of pregnancy was 23.8

*MMR = number of maternal deaths (while pregnant or within 42 days of end of pregnancy) excluding accidents and incidental causes per 100,000 live births

Source: Oklahoma State Department of Health (OSDH), Center for Health Statistics, Health Care Information, Vital Statistics
Maternal Deaths by Pregnancy Status

Source: Maternal Mortality Review Committee, cases reviewed since 2009
Maternal Deaths by Pregnancy-Related Status

- Related: 42.0%
- Possibly Related: 30.4%
- Not Related: 19.6%
- Missing: 4.5%

Pregnancy Related Status at Time of Death

*Pregnancy associated-but not related
*Unable to determine
AIM

Poised to reduce severe maternal morbidity per 1,000 deaths by 2018

Oklahoma is the first state to join the AIM initiative

IHE works in conjunction with Oklahoma Perinatal Quality Improvement Every Mother Counts Collaborative
In 2014 the Council was awarded a 4 year cooperative agreement from the Health Resources and Services Administration (HRSA) Maternal and Child Health Bureau (MCHB)

Alliance for Innovation in Maternal Health (AIM)

1. Partner development and strengthening
2. Maternal safety bundle implementation
3. State and national data infrastructure development
4. Reduce low risk primary Cesarean deliveries
5. Improve postpartum and interconception care
6. Reduce intrapartum and postpartum racial disparities
7. Provide intensive technical assistance

Oklahoma is FIRST state to join AIM!
INTEGRIS Health Edmond

- INTEGRIS Health Edmond is one of 8 birthing hospitals in the INTEGRIS System in Oklahoma.
- We are a community hospital just outside the Oklahoma City Metropolitan.
- We currently have a total of 40 inpatient beds with 10 of those being LDRP.
- We are currently under construction to increase to a total of 104 beds.
Severe Hypertension in Pregnancy

- Leading cause of pregnancy related deaths (CDC, 2010)
- Can result in preeclampsia, fetal growth restriction and early delivery
- Timely and appropriate treatment can significantly reduce hypertension-related complications (ACOG, 2015)
Hypertension Bundle

➢ READINESS:

• Standards for early recognition and warning signs
• Process for timely triage and evaluation
• Rapid access to medication used for severe hypertension
• Unit education to protocols-DRILLS

Hypertension Bundle

➢ RECOGNITION & PREVENTION:

• Standard Protocol for measurement and assessment of BP and urine protein for all pregnant and postpartum women

• Standard response to maternal early warning signs

• Facility-wide standards for educating prenatal and postpartum women on signs and symptoms of hypertension and preeclampsia
POST-BIRTH Warning Signs

- KNOW BEFORE YOU GO!
  - Given on tours
  - Given in prenatal class
  - Given in Discharge packet
Hypertension Bundle

RESPONSE:

- Minimum requirements for protocol

- Notify provider if systolic BP=/>160 or diastolic BP=/>110 for two measurements within 15 minutes

- After second elevated reading, treatment should be initiated ASAP (preferably within 60 min)

Routine, Ongoing, Starting Mon 5/13/19 at 0000, Until Specified
Initiate Order Set OBG Hypertension Management if Systolic Blood Pressure 160 or greater and/or Diastolic Blood Pressure 105 or greater. Notify provider that protocol has been initiated., L&D
Interdisciplinary Team

- Nursing Leadership - Education of Protocols
- Physician group - Adoption of protocols
- Pharmacy - assistance with hypertension order set

**Blood Pressure Management**

This protocol is for immediate management of hypertension. Additional orders may be needed for ongoing management of hypertension after stabilization.

- If patient does not have IV access, begin with nilodipine. If patient has IV access labetalol is the recommended course of treatment.

**Labetalol (Normodyne)**

- If less than 34 weeks gestation, consider steroids prior to delivery of infant.

**Labetalol HCl (Trafand) injection 20 mg**

- 20 mg. Intravenous, once as needed, high blood pressure. Starting Today at 10:49. For 1 dose
- Repeat blood pressure in 10 minutes. Target blood pressure is 140-150/90-100.

**Labetalol HCl (Trafand) injection 40 mg**

- 40 mg. Intravenous, as needed, high blood pressure. Starting Today at 10:49. For 2 doses
- Administer 10 minutes after first dose of 20 mg if Systolic Blood Pressure remains elevated greater than 160 mmHg and/or Diastolic Blood Pressure greater than or equal to 105 mmHg. Repeat blood pressure in 10 minutes to obtain target blood pressure of 140-150/90-100 mmHg.

**Labetalol HCl (Trafand) injection 80 mg**

- 80 mg. Intravenous, as needed, high blood pressure. Starting Today at 10:49. For 2 doses
- Repeat blood pressure in 10 minutes. Target blood pressure is 140-150/90-100. Wait at least 10 minutes after previous dose. Max 2 doses.

**Nursing Communication**

- Routine, once post occurrence Today at 11:00
- Notify provider if blood pressure remains above the target range after following the medication dosing parameters.

**Hydralazine (Apresoline) IV**

- Hydralazine (Apresoline) injection 10 mg

- 10 mg. Intravenous, at 15 mL/hr. Administer over 2 Minutes. Once as needed, high blood pressure. Starting Today at 10:49. For 1 dose
- Administer by slow IV push if blood pressure is not controlled by sequential doses of labetalol. Repeat blood pressure in 20 minutes. Target blood pressure is 140-150/90-100 mmHg.

**Nursing Communication**

- Routine, once post occurrence Today at 11:00
- Notify provider if blood pressure remains above the target range after following the medication dosing parameters.

**Nifedipine (Procardia)**

- If less than 34 weeks gestation, consider steroids prior to delivery of Infant.

**Nifedipine (Procardia) capsule 10 mg**

- 10 mg. Oral. Every 30 min PRN, high blood pressure. Starting Today at 10:49. For 2 doses
- Repeat in 30 minutes if systolic blood pressure is greater than or equal to 160 mmHg and/or diastolic blood pressure greater than or equal to 105 mmHg. Target blood pressure is 140-150/90-100 mmHg.
Treatment of SBP > 160 or DBP > 110 for Inpatients and Outpatients

Primary RN
- Notify OB and Charge Nurse

and
- Start IV and Draw Pre-E Labs
- Medication within 30-60 minutes of 2nd BP
- Monitor EFM
- Admit patient per order

then
- Continue BPs per IV Med protocol until remain less than 160/xx or xx/110, then repeat BP measurement
  - Every 10 min for 1 hour
  - Then every 15 min for 1 hour
  - Then every 30 min for 1 hour
  - Then every hour for 4 hours

Remains >160/xx or xx/110
- 30-60 min timeframe begins
- Recheck within 15 minutes

Position: Semi-Fowlers; cuff at level of heart

SBP > 160 or DBP > 110
- Recheck every 30 minutes for 2 hours

OB Provider
- Order IV push
  - Labetalol, IV
  - Hydralazine, or PO
  - Nifedipine
- Admit/OBS Patient
- Consider Mag

*Med Notes
- Labetalol IVP (q 10 min PRN; 300mg max/24h)
  - Peak response within 5 minutes
  - Requires continuous pulse oximetry x 1 hr after each dose.
  - Contraindications: asthma, heart block, pulse <60 bpm, CHF, meth use
- Hydralazine IVP (q 20 min PRN; 25 mg max/24h)
  - Peak response: 10-80 min
  - Contraindications: Mitral valvular, rheumatic heart disease, CAD
- Nifedipine PO (10 mg q 30 min PRN x 6 doses)
  - Contraindications: CAD, cardiac arrhythmia, aortic stenosis, HR >120

*Notify MD if BP out of normal range for patient even if not meeting above criteria. See EPIC Order set for Med Dosing
Hypertension Bundle

.Reporting

- 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 for process metrics
SEVERE HYPERTENSION 2017-2018

Month: July, Aug, Sep, Oct, Nov, Dec, Jan, Feb, Mar, Apr, May, Jun

- Severe Hypertension
- Treated within 1 hour

July: 5
August: 3
September: 3
October: 3
November: 2
December: 2
January: 1
February: 6
March: 5
April: 3
May: 3
June: 1

Legend:
- Blue bar: Severe Hypertension
- Yellow bar: Treated within 1 hour
SEVERE HYPERTENSION 2018-2019

- Severe Hypertension
- Treated within 1 hour
STAMPP-htn
Systematic Treatment And Management of PostPartum hypertension

Clinical guidelines and protocols
PREECLAMPSIA

- Common hypertensive disorder of pregnancy
- Characterized by HTN and proteinuria
- 5-7% of pregnancies
- 70,000 maternal deaths/year worldwide
- Death from seizures and bleeding
- Leading cause of prematurity
- Often presents atypically and there is no treatment
- Associated with long term cardiac and renal complications
LONG TERM RISKS OF PREECLAMPSIA

- Increased risk of cardiovascular disease (CVD) such as hypertension, myocardial infarction and congestive heart failure, cerebrovascular event (stroke), peripheral arterial disease and cardiovascular mortality later in life

- Women with a hypertensive disorder of pregnancy have 12- to 25-fold higher rates of hypertension than women with a normotensive pregnancy in the year after delivery

- Increased risk of end stage renal disease, stroke and dementia

- Rates of PP morbidity with severe HTN, stroke increasing

- Lack of physician awareness
  - 56% of internists and 23% of ob-gyns were unsure or did not know whether preeclampsia is associated with ischemic heart disease
  - only 9% of internists counseled women who had preeclampsia about cardiovascular risk reduction
LIFE SAVING INTERVENTIONS

➢ What can you do at your hospital level?
Our hospital journey

- Participate in ILPQC - treatment of acute severe HTN, huddle and discharge instructions

- STAMPP - HTN - Systematic Treatment And Management of PostPartum *hypertension*

- >85% of patients with HTN are AA and majority are obese
  
  » At risk for HTN and CVD
PROBLEMS AT THE LEVEL OF THE HOSPITAL

➢ At the time of admission and discharge
  • General lack of knowledge among patients about long term effects of preeclampsia
  • No organized effort for education to patients
  • Discharge instructions not universally given
  • No dedicated postpartum clinic for easy access to care

➢ Problems with readmissions in ED
  • Identifying post partum patients
  • Incorrect Treatment of PP HTN
  • Poor knowledge about definition of severe for PPHTN
  • Calling medicine or cardiology instead of OB
  • Delayed transfer to L/D
  • Delay in recognition and treatment of severe PPHTN

➢ No standardized management for readmissions for PPHTN
Preeclampsia Educational Video

https://www.youtube.com/watch?v=hVPxFZDEFZI
During hospitalization and discharge

- **FBC Video**
- **Nursing - FBC**
  - Written instructions - EVS
  - Tear pad
  - Bracelets
  - BP cuff
  - Preeclampsia discharge checklist
  - Postpartum preeclampsia care
Preeclampsia Discharge Checklist

- Patient watched Preeclampsia Education Video on GetWell network? Yes or No ________
- Nurse provided Postpartum Preeclampsia Care education sheet and reviewed it with patient? Yes or No ________
- ILPQC form is completed/ILPQC flowsheet is completed? Yes No NA ________

- Blood pressure cuff is given to patient and instructions are reviewed? Yes or No________
- Preeclampsia medical alert band is given to patient ________
- 1 week postpartum hypertension clinic appointment is made? Appointment date and Time ________
  If no appointment is noted, page Ante Resident or Amina Ghalvoun pager x 0055.

  Discharge RN: ______________
  Date and Time of D/C: __________

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**POSTPARTUM PREECLAMPSIA CARE**

**TAKE YOUR BLOOD PRESSURE AT HOME**

- Know Preeclampsia Symptoms
  - Headache that won’t go away
  - Visual disturbances (seeing spots or auras)
  - Epigastric pain (upper right quadrant)
  - Sudden weight gain
  - Breathlessness (difficulty breathing)
  - Swelling of the face, legs, or hands
  - “just not feeling right”; unexplained “anxiety”

- Take at least 3 readings a day. One in the morning before taking your medication and one in the evening. Record all results.
- Take your blood pressure monitor with you to your 1 week clinic appointment. The provider will review your stored blood pressures in your blood pressure monitor.

**IMPORTANT INFORMATION:**
- My 1 week preeclampsia follow-up appointment is on __________
  
- Blood pressure medications prescribed:
  
- How to get help
  - For medical emergencies call 911.
  - If your blood pressure is 160 or greater systolic (top number) or 110 or greater diastolic bottom number, go to the emergency room for evaluation.
  - For Postpartum Hypertension clinic call 773-782-6118

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**KNOW YOUR RISKS**

- Euphoria
- Stroke
- Organ damage
- Death

**MONITOR YOUR BLOOD PRESSURE AT HOME**

**TAKE YOUR MEDICATIONS**

**GET FOLLOW-UP CARE**
STANDARDIZED PROTOCOLS FOR MANAGEMENT OF PPHTN
PPHTN clinics

➢ Follow up in PPHTN clinic
  • Appointments before discharge
  • Standardized Protocol for treatment of HTN
  • Patient to be sent to L/d for severe HTN
  • Long term follow up with cardiology
PPHTN clinic workflow

1. History, assessment, medication education & management, monitoring
2. Stabilize patient until successfully transitioned to cardiology for long term follow up
3. Baseline clinical protocol & collaborative practice agreement in place
Post Partum HTN Clinic
Population: Preeclampsia, Superimposed Preeclampsia, and Gestational HTN
Goal <140/90

- **SBP ≥ 160 and/or DBP ≥ 110 persistent for 15 minutes**
  - **Triage to L&D - 26639** *(Follow PRICE)*
  - **Alert MFM Attending**
  - **Follow up with pharmD or cardiology per hospital dispo**

- **SBP 150-159 and/or DBP > 100 without alert symptoms**
  - Increase dose by 30-50% and/or add labetalol or nifedipine XL
  - Regimen high doses of ≥2 agents? Page cardiology 9189
  - 1 week follow up: <150/100 then 6 week PP cardiology visit
  - Abnormalities? Alert MFM attending + If Admit > MFM
  - Follow up BP >150/100, w/ normal labs, titrate med(s)

- **SBP 140-150 & DBP 90-100**
  - Follow up in 2 weeks
  - Order CMP, CBC w/ diff, P/C ratio

- **SBP >150 or DBP >100 then follow orange protocol**

- **BP <150/100 follow up 6 week PP with cardiology**

- **SBP <140 & DBP <90**
  - Taper regimen 30-50% but stop if <120/80
  - Patient to call if SBP >150 or DBP >100
  - 6 week PP cardiology appt 29461
Management of BP’s postpartum and discharge after delivery - IMMEDIATE PP

Mild Hypertension (<160/105)
- Chronic hypertension
- Gestational hypertension
- Pre-eclampsia without severe features

Goal BP 140-150/90-100
- Treat with PO antihypertensive if BP >150/100 persistent and 4 hours apart

Severe hypertension (>160/105)
- Magnesium for 24 hours with anti-HTN medications per protocol.

Discharge PPD#3
- Give preE instructions
- Give BP cuff
- Follow up in PPHTN clinic in 7-10 days

PreE without severe features

Discharge PPD#3
- Give preE instructions
- Give BP cuff
- Follow up in PPHTN clinic in 7-10 days

Mild gHTN
- Discharge PPD#2
  - Followup in 1-2 weeks with PCP
  - Give written preE instructions
  - Write prescription for BP cuff if patient doesn’t have one

Severe GHTN
- same as severe preE

All patients with gHTN or PreE
- Watch the preE video on the care network
- Give written preE instructions tearpad sheet
- Give BP cuff
- Follow up in PPHTN clinic in 7-10 days
Postpartum re-entry into the hospital with hypertension (>140/90)

Patient who are postpartum within six weeks of delivery and have HTN (>140/90)

- **Calls from Home**
  - Comes to L&D triage

- **Comes from ED**
  - **Pivot nurse**: patient with hypertension (>140/90) and post partum
    - AMS, clinical suspicion for heart failure or respiratory failure, active seizure?
      - Yes
        - Call OB resident STAT- 55142
      - No
        - Send to L&D triage

- **Comes from the clinic**
  - BP > 160/105, send to L/D
  - All other patients - if admission needed direct admit to MB or L/D (whichever is available)
    - Call L/D resident to notify
    - Resident to notify charge
READMISSIONS
The PRICE study: Pre-eclampsia Readmission Inpatient Care Evaluation
Postpartum hypertension (>140/90) measured twice at least 4 hours apart, between delivery and six weeks postpartum
All patients should be admitted to MFM

Mild Hypertension (<160/105)
- Chronic hypertension
- Gestational hypertension
- Pre-eclampsia without severe features

Labs/ BP monitoring in triage for 2 hours

Non severe BP+ known diagnosis+ no symptoms

YES
- Follow up primary OB/ PCP in 2-3 weeks for CHTN
- Follow up in 7-10 days in PPHHTN clinic for CHTN and PE
- Can start on PO antihypertensives if BP >150/100

NO
- New diagnosis of CHTN, prex or symptoms
- Admit for BP monitoring

Hypertension + proteinuria + signs of end organ involvement

Concern for heart failure: pulmonary edema, palpitations, tachycardia, shortness of breath
- Cardiology/Medicine consultation
- Transfer to cardiology if workup positive for cardiomyopathy

Concern for CNS involvement: headache, seizures
- Cardiology/Medicine consultation
- Transfer to medicine if workup positive for other etiology

Magnesium for 24 hours with anti-HTN medications per protocol

Severity Hypertension (>160/105) + proteinuria or Concern for HELLP or partial HELLP

Magnesium for 24 hours (if never got Mag before) Re- mag per MFM attending preference with anti-HTN medications per protocol.

Response to treatment?

NO
- Transfer to medicine if workup positive for medical etiology

YES
- Response to treatment?
- Follow up in 7-10 days in PPHHTN clinic
- Cardiology/Medicine consultation
- Transfer to cardiology if workup positive for neurological etiology

Contact information:
PPHTN appointments: x 26118
Cardiology outpatient appointments: x 29461
Cardiology consult: x 3547
Dr. Tamar Polonsky pager: x 9189

ALL patients with CHTN or PreE:
- Watch the pre video on the care network
- Give written pre instructions- tear pad sheet
- Give BP cuff
- Follow up in PPHHTN clinic in 7-10 days

1All patients admitted with post-hypertension should have at least 24 hours of BP monitoring, with exception being chronic hypertensives.
2Treat BP if >150/100 if persistent or 4 hours apart with PO antihypertensives
3Response to treatment should be defined by at least 12 hours of blood pressures <150/100 prior to discharge.
4Examples of etiologies that would be appropriate for transferring to medicine: thyrotoxicosis, pheochromocytoma, arterial stenosis, adrenal tumors
5Examples of etiologies that would be appropriate for transferring to neurology: intracranial process, stroke, non-eclamptic seizures
6Examples of appropriate transferring to cardiology: inability to control blood pressures despite high doses of Procardia and labetalol OR requiring IV anti-hypertensive drip
7Examples of appropriate transferring to medicine: if workup positive for HUS, TTP, exacerbation of lupus, acute fatty liver
## Maternal demographic and baseline characteristics

<table>
<thead>
<tr>
<th></th>
<th>Mean (SD) / %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient demographics</td>
<td></td>
</tr>
<tr>
<td>Maternal age in years</td>
<td>26.6 (SD 6.2)</td>
</tr>
<tr>
<td>Nulliparous</td>
<td>40.8%</td>
</tr>
<tr>
<td>Type of Insurance</td>
<td></td>
</tr>
<tr>
<td>Medicaid</td>
<td>68.4%</td>
</tr>
<tr>
<td>Race</td>
<td></td>
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<tr>
<td>Black/African American</td>
<td>85.4%</td>
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<tr>
<td>White</td>
<td>13.4%</td>
</tr>
<tr>
<td>Gestation Age (weeks)</td>
<td>37.3 (SD 3.6)</td>
</tr>
<tr>
<td>Preeclampsia with Severe Features</td>
<td>39.4%</td>
</tr>
<tr>
<td>Mode of Delivery</td>
<td></td>
</tr>
<tr>
<td>Cesarean</td>
<td>36.7%</td>
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<tr>
<td>Vaginal</td>
<td>60.9%</td>
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<tr>
<td>Operative/VBAC</td>
<td>2.4%</td>
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<tr>
<td>Antepartum anti-hypertensive medications</td>
<td></td>
</tr>
<tr>
<td>Labetalol</td>
<td>31.0%</td>
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<tr>
<td>Nifedipine</td>
<td>11.1%</td>
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<tr>
<td>Hydralazine</td>
<td>5.8%</td>
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<tr>
<td>Methyldopa</td>
<td>0%</td>
</tr>
<tr>
<td>Other</td>
<td>1.2%</td>
</tr>
<tr>
<td>Postpartum anti-hypertensive medications</td>
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<tr>
<td>Labetalol</td>
<td>11.7%</td>
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<tr>
<td>Nifedipine</td>
<td>14.0%</td>
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<tr>
<td>Hydralazine</td>
<td>2.3%</td>
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<tr>
<td>Methyldopa</td>
<td>0%</td>
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<tr>
<td>Other</td>
<td>7.0%</td>
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<tr>
<td>Total Length of Stay (days)</td>
<td>4.3 (SD 3.2)</td>
</tr>
<tr>
<td>Blood Pressure Follow-up within 7-10 days</td>
<td>28.0%</td>
</tr>
</tbody>
</table>
Figure: shows the patterns of BP (systolic and diastolic) after delivery
TEAMWORK = SHARED MENTAL MODEL

- Ensure that team members know what to expect
- Communicate frequently
- Synchronize care
- Ensures that everyone is "on the same page"
- Enables members to predict and anticipate one another’s needs
WHERE TO BEGIN...

- Create a team with diverse members (OB physicians, nurses, anesthesiologist, pharmacist, managers)
- Compare your hospital with the bundle elements
  - Gap analysis
  - Focus on areas that may be easiest to implement (get an easy win)
  - Identify potential barriers and honestly address them
- Communication, Response & Reliable Processes
  - High risk huddles and debriefing
- Simple debrief
  - Timely and easy to do
  - Should provoke awareness and ideas
  - Identifies problem areas, confirms best practices
  - Plan for follow-up and reporting back to staff
- Post the process- pocket note book, bulletin boards, posters, food/networking

CMQCC
Our team

Aisha Kendrick- RN
Macaria Solache- RN
Samantha Delos Reyes- Fellow
Jacqueline Nichols – MS IV
Jocelyn Wascher- MS IV
Ruby Minhas- research Fellow
Kavia Khosla- MS I
Jenny Whitlock- CLI
Sarosh Rana- MFM faculty

Funding:
CLI women’s Board
Omron Healthcare
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
Website for ordering customizable [Preeclampsia/Postpartum Preeclampsia] wristbands:

https://www.wristbandbuddy.com
Next Safety Action Series

Establishing a Program for the Transition from Maternity to Well-Woman Care

June 4, 2019
12:30 pm Eastern

Sarah Jernigan, MSN, ACNP-BC, CSC
Patient Advocate

Rachel Urrutia, MD, MSCR
Assistant Professor,
University of Carolina at Chapel Hill,
Department of Obstetrics and Gynecology

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