ANSWERING THE CALL FOR IMPROVED MATERNAL SAFETY
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• Employer
  – Harris Health System

• Objectives:
  – Discuss current focus on improving maternal outcomes
  – Describe patient safety initiative:
    • Maternal Early Warning System (MEWS)

• Conflict of Interest, Sponsorship/Commercial Support
  – Not Applicable
Maternal Deaths in the U.S. Are on the Rise
Maternal mortality ratio (number of maternal deaths per 100,000 live births)

- United States
- Developed Regions

Maternal Mortality Ratio

<table>
<thead>
<tr>
<th>Region</th>
<th>1990</th>
<th>2013</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>380</td>
<td>210</td>
<td>-45%</td>
</tr>
<tr>
<td>Developed Regions</td>
<td>26</td>
<td>16</td>
<td>-38%</td>
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<tr>
<td>Developing Regions</td>
<td>430</td>
<td>230</td>
<td>-47%</td>
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<tr>
<td>United States</td>
<td>12</td>
<td>28</td>
<td>+136%</td>
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</table>

Source: World Health Organization

Mashable, Statista
Maternal Mortality Rate: Texas

Figure 1. Maternal mortality rate by racial/ethnic group, 2005-2014.
Racial Disparity

U.S. Pregnancy Related Mortality Ratios

Black to White ratio – 3.4 - 4.0 : 1

CDC, 2016
Causes of Pregnancy Related Deaths (U.S. 2011 - 2013)

- Cardiovascular Diseases: 15.50%
- Non-cardiovascular diseases: 14.50%
- Infection or sepsis: 12.70%
- Hemorrhage: 11.40%
- Cardiomyopathy: 11.00%
- Pulmonary embolism: 9.20%
- HTN Disorders of Pregnancy: 7.40%
- Cerebrovascular accident: 6.60%
- Amniotic fluid embolism: 5.50%
- Anesthesia complications: 0.10%

CDC, 2016
Causes of Pregnancy Related Deaths: Texas 2011-2012

Source: CHS Death File, 2011-2012
Approximately **ONE HALF** of all Maternal Deaths are considered **preventable**
Harris Health System
Ben Taub Hospital

- Harris County: underserved, underinsured
- Deliveries 343/month; 3690 annually (2016)
- 5650 OB-Intake visits (2016)
- Baylor resident program (Obstetrics, Family Practice, Anesthesia)
- Certified Nurse Midwifery
- Level I, II and III Nurseries
- VBAC rate 77.4%
Obstetrics Quality Review Process

Adverse Events

• ERIS entered by RN

• All events reviewed by Nursing Leadership
  – Manager, Clinical Resource Nurse and DON

• All events reviewed by Physicians
  – Chief of Service, Director of Quality
    • Assigned for independent or full review

• Reviewed by Multi-disciplinary OB/GYN Quality Review Committee
BTH OB/GYN Quality & Safety Committee Review Process Flow

Quality Review Indicated based upon Pre-Established Criteria:
- ≥37 w/0d with Neonatal 5 minute Apgar Score < 7
- Umbilical cord pH (venous or arterial) < 7.0
- Unanticipated neonatal admission to Level III nursery (>35 weeks)
- Neonatal birth injury (e.g., laceration, pleural, fracture (excluding clavicular fracture))
- Uterine rupture
- Transfusion of ≥4 units pRBCs for Ob patients
- Transfusion of pRBCs for intra-op/post-op Gyn patients (within 72 hrs of surgery start time)
- Unanticipated Ob/Gyn admission to critical care unit
- Unanticipated return to OR (Ob or Gyn)
- Ob/Gyn re-admission within 30 days of discharge
- Retained Object
- Operative injury (i.e., bowel, bladder, ureter)
- Surgical site infection (Ob or Gyn)
- Intrapartum fetal or maternal death
- Maternal code blue
- Neonatal death (> 2500 grams)
- Gyn patient death
- Unanticipated removal of organ
- VTE during hospital admission
- Postpartum hemorrhage

OB/GYN Quality Committee reviews all cases meeting criteria

OB/GYN Quality Committee has all necessary information?

Yes

OB/GYN Quality Committee assigns status to all reviewed cases

No

Request additional information from provider or assigned nurse(s)

OB/GYN Quality Committee reports findings and aggregate reports to pavilion quality committee, upon request
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<thead>
<tr>
<th>A</th>
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Maternal Early Warning System
MEWS: 2014

• OB Adverse Events
  – Multi-disciplinary OB/GYN Quality Review Committee
  – Identified gap related to Maternal OB adverse Events

• Taskforce created
Taskforce

- Nursing and Providers: L&D and MBU
- Reviewed literature: Maternal Morbidity
- Met with MEWS content expert
- Conducted a retrospective review of incidents
Our mission is to end preventable morbidity, mortality and racial disparities in California maternity care

Continually improve patient safety in women’s health care through multidisciplinary collaboration that drives culture change

To improve and promote the health of women and newborns and to strengthen the nursing profession through the delivery of superior advocacy, research, education and other professional and clinical resources to nurses and other health care professionals

Dedicated to the advancement of women’s health care and the professional and socioeconomic interests of its members through continuing medical education, practice, research, and advocacy
California Maternal Mortality Review 2002-2005

<table>
<thead>
<tr>
<th>Delayed response to triggers</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>Preeclampsia</td>
<td>92%</td>
</tr>
<tr>
<td>Postpartum hemorrhage</td>
<td>85%</td>
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<tr>
<td>Cerebrovascular disease</td>
<td>63%</td>
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<td>Venous thromboembolism</td>
<td>75%</td>
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<td>Amniotic fluid embolism</td>
<td>67%</td>
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</table>

Preventing Maternal Death

Identify specific triggers for responding to changes in the mother’s vital signs and clinical condition and develop and use protocols and drills for responding to changes.

January 26, 2010
**MATERNAL EARLY WARNING SYSTEM**

BEN TAUB HOSPITAL - WOMEN AND INFANT’S DEPARTMENT

**MEWS TRIGGERS**

The Maternal Early Warning Criteria

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Threshold</th>
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<tbody>
<tr>
<td>Systolic BP</td>
<td>&lt;90 or &gt;160</td>
</tr>
<tr>
<td>Diastolic BP</td>
<td>&gt;110</td>
</tr>
<tr>
<td>Heart Rate (beats per minute)</td>
<td>&lt;50 or &gt;120</td>
</tr>
<tr>
<td>Respiratory Rate (breaths per minute)</td>
<td>&lt;10 or &gt;30</td>
</tr>
<tr>
<td>Oxygen saturation, on room air</td>
<td>&lt;95%</td>
</tr>
<tr>
<td>Oliguria, mL/hr for ≥ 2 hours</td>
<td>&lt;35</td>
</tr>
<tr>
<td>Vaginal Bleeding/PPH ≤ 2 hours</td>
<td>500 mL (qBL)</td>
</tr>
</tbody>
</table>

Maternal agitation, confusion, or unresponsiveness; patient with preeclampsia reporting a non-remitting headache or shortness of breath

These triggers cannot address every possible clinical scenario that could be faced by an obstetric clinician and must not replace clinical judgment. As a core safety principle, bedside nurses should always feel comfortable to escalate their concerns at any point.

CE/MEWS taskforce 8/2016
**MEWS workflow**

Validate VS, inform primary RN, & document in MR

**Notify** resident w/in 5 min. of trigger

- senior resident: **281-262-0904**
- if 3C - antepartum resident: 3-9491

**Notify** Charge RN and Document

**Escalate** if no response w/in 5 min

- Attending – 3-9511

**Escalate** if not at bedside w/in 15 min:

- re-notify Attending; NCM/DON or ADON

Use “Check back” Communication and Document
<table>
<thead>
<tr>
<th>MEWS OB</th>
<th>1/10/17</th>
<th>1/13/17</th>
<th>1/14/17</th>
<th>1/18/17</th>
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<tbody>
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<td>0333</td>
<td>0045</td>
<td>2125</td>
<td>2104</td>
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<td>Vital Signs Validated?</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>SBP&gt;160</td>
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<tr>
<td>Time Person/Provider Notified</td>
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<td>0333</td>
<td>0050</td>
<td>0030</td>
<td>2104</td>
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<td>Name of Person/Provider Notified</td>
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<tr>
<td>Time Person/Provider at Bedside</td>
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<td>0342</td>
<td>0053</td>
<td>0042</td>
<td>2115</td>
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<td>Name of Person/Provider at Bedside</td>
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<td>Response</td>
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<td>Other</td>
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</table>
• Associated Clinical Significance
  – Anecdotal perceptions: change in culture – nursing and providers
Hemorrhage Project: 2016
Readiness, Recognition, Response

The AWHONN Postpartum Hemorrhage Project

POSTPARTUM HEMORRHAGE PROJECT — RECOGNITION, READINESS & RESPONSE
(Refer to the corresponding PPH Educational Modules for each key behavior and the specific recommendations.)

- Quantification of Blood Loss (QBL): Quantify blood loss by utilizing scales and calibrated equipment to measure cumulative maternal blood loss after every birth. (Refer to AWHONN Practice Brief: QBL and the QBL Measurement Log.)

- Team Debriefing:
  - Simulation Based Training: Conduct in situ, inter-disciplinary simulation-based training to allow OB teams to practice management of PPH.
  - Team Debriefing: Conduct a focused debrief as soon as the woman is stabilized for all postpartum hemorrhages that progress to Stages 2 and 3. (Refer to Team Debriefing Form.)

- Postpartum Hemorrhage Policy:
  - Have a PPH policy that defines the blood loss parameters and interdisciplinary management for each postpartum stage. (Refer to PPH Algorithm.)

- Oxytocin Administration for Active Management of the 3rd Stage of Labor:
  - Administer oxytocin and fundal massage after every birth. Maintenance rate is determined by the patient's requirements and availability of oxytocin.

- Massive Transfusion Protocol (MTP):
  - Have a massive transfusion protocol that includes criteria for activation, who may initiate the protocol, and the standard pack or warmer contents. (Refer to Elements of a Sample Hospital-based MTP.)

- Transfusion Therapy:
  - With ongoing hemorrhage, initiate blood transfusion therapy as quickly as possible. Do not wait for lab results or worsening maternal status. Aggressively transfuse units in ratio of 2RBCs:1FFP.

PPH Risk Assessment
- PPH Risk Assessment: Perform postpartum hemorrhage risk assessments upon admission, pre-birth, and post-birth. (Refer to PPH Risk Assessment Table.)

Maternal Warning Signs:
- Maternal Warning Signs: All women meet any of the Stages 1 to 3 blood loss and/or vital sign criteria should receive prompt bedside evaluation.

Simulation Based Training:
- Transfusion Therapy:
- Team Debriefing:
- Postpartum Hemorrhage Policy:
- Oxytocin Administration for Active Management of the 3rd Stage of Labor:
- Massive Transfusion Protocol (MTP):
- Transfusion Therapy:

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“In the middle of every difficulty lies opportunity”
- Albert Einstein
Questions

References: Available upon request

Suzanne.Lundeen@harrishealth.org