Perinatal Webinar: Maternal Early Warning System – ARCHIVED MODULE

Perinatal Education Series 2017
Date of Live Event: June 9, 2017 @ 12:00 noon – 1:00 p.m.
THIS ARCHIVED WEBINAR WILL BE AVAILABLE FOR NURSING CE's from July 1, 2017 – January 1, 2018

MICHELLE FLANAGAN, RNC, BSN
OBSTETRIC OUTREACH EDUCATOR
PALMETTO HEALTH PERINATAL SYSTEMS

DIRECTIONS:

► Please follow along with the pre-recorded webinar found on the Perinatal Systems Website.

► Nursing CE's will only be applicable if the webinar is viewed between July 1, 2017 and January 1, 2018.

► If you have any questions, please contact our office at: PerinatalSystems@PalmettoHealth.org

Disclosure:

"Please note that this Power Point presentation is an educational tool that is general in nature. It is not intended to be an exhaustive review of the subject matter or the opinion of Palmetto Health. Materials presented in this presentation should not be considered a substitute for actual statutory or regulatory language. Always refer to your legal counsel and the current edition of a referenced statute, code and/or regulation for precise language."
Goals/Objectives

- **Overall Purpose/Goal:**
  - Participants will be able to identify characteristics in assessments used in maternal early warning systems (MEWS) and verbalize the benefits to patient outcomes.

- **Objectives - Participants will be able to:**
  - define Early Warning Systems for use in healthcare
  - describe and verbalize implementation for obstetric related Early Warning Systems, known as MEWS (Maternal Early Warning System)
  - participate in Case Study utilizing Maternal Early Warning System

Early Warning Systems in Healthcare

What is a Warning System?
What about medical related warning signs?

Other Warnings in Healthcare

https://www.youtube.com/watch?v=xGU8Ss3TolI

How do we process clinical information?

- Clinical reasoning
  - A context-dependent way of thinking and decision-making in professional practice to guide practice actions.
  - A way to convert information to knowledge and understanding for the purpose of making decisions.
  - Occurs within the context of problem spaces.
  - Incorporates admission of practice and research findings supporting evidence-based practice.
  - Occurs over time and space, and may be influenced by context and condition.
  - Involves multiple critical conversations, knowledge generation, reflection, and feedback from clients and healthcare practitioners.

How does the clinical reasoning change in emergent situations or when a patient’s condition changes?

- "Many times, hospitalized patients exhibit warning signs in the hours before experiencing critical health problems (e.g., cardiopulmonary arrest), but these signs are often not recognized, leading to the patient’s death (i.e., a situation commonly known as “failure to rescue”)."

- "Modified Early Warning System is a simple scoring system applied to patients’ routinely measured physiological vital signs to identify patients likely to deteriorate, notify physicians and other caregivers when appropriate, and take other necessary steps to avert further decline."

Basics of EWS’s

- Early Warning Systems
  - Identified as key in the timely recognition of impending changes in patient stability as identified by the Agency for Healthcare Research and Quality (AHRQ)
  - Developed and implemented in a variety of ways across acute care hospitals
  - Focus = consistently identify pending patient issues with the goal to improve patient outcomes
  - Failure to recognize what researchers have identified as frequent, yet subtle changes prior to an arrest may lead to delay in patient care, ICU admissions, extended hospital stays, and serious negative patient outcomes
  - Dependent on the successful communication of those changes to the appropriate person or team

The Modified Early Warning System

- Tool for nurses to help monitor their patients and improve how quickly a patient experiencing a sudden decline receives clinical care. The color-coded patient chart gives a visual cue as to when to calculate a MEWS score.

- Scoring is based on:
  - Respiratory rate
  - Heart rate
  - Systolic blood pressure
  - Conscious level
  - Temperature
  - Hourly urine output (for previous 2 hours)
"For the past few years, the Institute for Healthcare Improvement (IHI) has challenged hospitals across the United States to reduce cardiac arrests and other life-threatening events in patients on general medical floors by implementing a system of Rapid Response Teams."

- Empowers staff nurses
- Empowers family members
- Calls a designated group of clinicians to a patient’s bedside to critically and quickly evaluate signs of a worsening condition
- Initiates steps to improve outcomes (e.g., transferring the patient to ICU if necessary)

http://www.ihi.org/resources/Pages/ImprovementStories/EarlyWarningSystemsScorecardsThatSaveLives.aspx
Agency for Healthcare Research and Quality (AHRQ): Early Warning Systems

- **Planning and Development Process**
  - Team formation
  - Baseline analysis
  - Literature review
  - Retrospective chart review
  - Pilot test
  - Earlier-than-expected system-wide expansion

**Resources Used and Skills Needed**
- Staffing
- Costs

**Getting Started with This Innovation**
- Embed assessment system into workflow
- Address staff resistance

**Sustaining This Innovation**
- Provide ongoing feedback and reward use and success
- Continue coaching


**ARHQ – “Last notes” for EWS**

- **Use By Other Organizations**
  - Since implementation of Mercy Hospital Anderson, MEWS has spread to the other four Mercy Hospitals in southwest Ohio (Mercy Hospital Clermont, Mercy Hospital Fairfield, Mercy Hospital Mount Airy, and Mercy Hospital Western Hills).

- **Lessons Learned**
  - MEWS facilitates early recognition of a gradual decline in health status that, if not managed, can lead to death. However, it cannot eliminate all “code blue” events, as some may occur without warning, for example, sudden cardiopulmonary death can be caused by a number of events, such as the rupture of an aortic aneurysm, that cannot be predicted or prevented.


**We see the benefit in use of early warning systems - now what are you thinking?**

- This is a great idea, how can the system be modified for use where I work?
First, EWS have been modified for pediatric use

- Myth 1: abnormal observations mean abnormal outcomes
- Myth 2: normal sets of observations mean normal outcomes


Core Elements of the Safe System Framework

- Education and training
- Patient Safety Culture
- Open and considered learning
- Partnerships with patients and families
- Responding to deterioration
- Recognizing deterioration


Maternal Early Warning Systems – “MEWS”
Maternal Health in the News

Maternal Health in the News

Maternal Health in the News

Maternal Health in the News

Maternal Morbidity in the US

Maternal Morbidity in the US

Maternal Morbidity in the US

Maternal Morbidity in the US

Severe Maternal Morbidity Indicators

1. Cardiac arrest or ventricular fibrillation
2. Acute congestive heart failure or pulmonary edema
3. Adult respiratory distress syndrome
4. Acute renal failure
5. Disseminated intravascular coagulation
6. Shock
7. Eclampsia
8. Puerperal cerebrovascular disorders
9. Heart failure or arrest during surgery or procedures
10. Aneurysm
11. Acute myocardial infarction
12. Air and thrombotic embolism
13. Amniotic fluid embolism
14. Sickle cell disease crisis
15. Severe anesthesia complications
16. Sepsis
17. Hysterectomy
18. Ventilation
19. Conversion of cardiac rhythm
20. Temporary tracheostomy
22. SMM with blood transfusions
23. SMM without blood transfusions
Maternal Mortality in the US

[Graph showing trends in pregnancy-related mortality in the United States, 1998-2013]

Note: Number of pregnancy-related deaths per 100,000 live births or fetal deaths.

Why are women dying in pregnancy?

[Red background with no text]

https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pmss.html

What can we do about rising maternal morbidity and mortality?

- "State and national review of maternal deaths have suggested that significant improvement could have been made in the care provided to many of the women who died, and many of these cases were potentially preventable events."

At the National Level: Key Priorities in Maternal Safety

- Core Patient Safety Bundles
  - OB Hemorrhage
  - Severe Hypertension in Pregnancy
  - Venous Thromboembolism Prevention in Pregnancy
- Supplemental Patient Safety Bundles
  - Maternal Early warning Criteria
  - Facility Review
  - Family and Staff Support

National Partnership for Maternal Safety

- Data from US, France, & UK suggests that 40-50% of maternal deaths are potentially preventable.
- Majority of deaths due to hemorrhage, hypertension, infection, and VTE
- Delays in recognition, diagnosis, and treatment often precede an event.

How to facilitate timely diagnosis and treatment?
- Are there barriers?
- What are the human factors?
- What tools are available?
- Are there system problems?

"MEWS"

Maternal Early warning System

- Goal of early warning systems is to ensure timely recognition of patients developing acute illness
- The early warning systems in use for non-Obstetric patients do not work well for Obstetric patients.
- We know abnormal physiologic signs and symptoms often precede critical illness
- In 2010 the Joint Commission issued a requirement for birth facilities to develop written criteria describing early warning signs indicating a change or deterioration in a patient’s condition and the requirement to promptly seek further assistance.
- In 2007, the United Kingdom recommended adoption of the Modified Early Obstetric Warning System.


Differences in the OB Warning system:
- Physiologic changes that occur during pregnancy
- Small number of conditions responsible for most maternal severe morbidity and mortality.

"In this system, 2 moderately abnormal parameters (yellow alerts) or 1 severely abnormal parameter (red alert) triggers a clinical response to urgently assess the patient’s status and make a follow-up surveillance plan.”


Sample Maternal Early Warning System

Requirements for Triage Assessment

1. An individual or individuals determined qualified as designated by hospital policy must perform an appropriate medical screening examination(s) to determine whether the patient has an emergency medical condition. The examination(s) should be done in a timely manner and should account for the health of the woman and fetus.

2. If an emergency exists, the patient or family (if the patient is incapable of doing so) should be stabilized or transferred if the obstetric care provider certifies that the benefits of transfer outweigh the risks. In the case of the latter, a written certification is required.

3. When necessary, arrange for transfer within the hospital or to another appropriate facility if the patient is stabilized or if the benefits of transfer outweigh the risks. Transfer should be carried out by qualified personnel and transportation equipment. Patients can decline transfer after being informed of the risks and benefits of transfer. Appropriate medical screening cannot be delayed to inquire about payment method or insurance status.

ACOG Committee Opinion Number 667, July 2016. Hospital-Based Triage of Obstetric Patients

Successful Implementation of MEWS

- First: Clinical and support staff education
- How data is inputed or generated
- How the system is scored
- When to trigger the EWS
- Second: Easily available protocol on each unit for reference
- Protocol
- Plan for how triggers are recognized and managed
- When to trigger EWS
- Plan for prospective review of effectiveness and clinical impact
- Third: Reduce barriers
- Strategies to reduce any barriers to use, such as nursing discomfort with initiating escalation of care or activating a chain of command
- Multidisciplinary educational sessions, with consideration for simulation exercises
- Fourth: Review
- Plan for prospective review of the effectiveness and clinical impact of implementation

Important things to remember:

- Although the use of these tools is widely supported, there is no uniform criteria for inclusion or what degree of abnormality should be used to trigger more aggressive intervention, and neither early warning tool was specifically designed to address the 4 most common causes of maternal morbidity (hemorrhage, preeclampsia, sepsis, and cardiovascular dysfunction).
Unit Implementation of MEWS

- Tools for implementation: Triggers / Bundles / Protocols / Checklists
  - evidence based and facilitate measurable improvements in quality of care
  - aid timely diagnosis and treatment to prevent or limit the severity of morbidity
  - customizable for local implementation
  - should be living tools that are evaluated and modified based on ongoing feedback after their implementation and in the context of evolving care standards and processes

- “The ideal early warning system is one that does not overwhelm the system due to resource overutilization, lead to burnout, or result in desensitization due to a low positive predictive value. Conversely, an effective early warning system will reliably identify those patients in need of further evaluation and possible escalation of care.”


Potential Barriers

- Potential to decrease individualization of care
- National or even state recommendations have to be altered to fit the local hospital
- Low compliance for implementation / acceptance
- Must have continued follow up and review of the tools / triggers / responses and the impact on outcomes for patients


Guidelines for Implementation

- Education and training in MEWS triggers for clinical staff including physicians, nurses, patient care assistants, and unit support staff
- Identification of bedside responders to a MEWS trigger
- Effective communication: whom to notify, how to notify them, and when and how to activate the chain of command to ensure an appropriate response
- Identification of a Rapid Response Team to support bedside responders
- Implementation of quality improvement metrics based on the individual institution’s resources
- Leadership support for chain of command policy to provide prompt bedside evaluation and treatment

Staff Requirements

Initial Response
- The initial OB provider for patient assessment should be credentialed in obstetrics and may be a physician, certified nurse midwife, nurse practitioner, or physician assistant.
- If no credentialed obstetrics provider is available, each institution should specify an appropriate initial bedside responder, while simultaneously contacting the obstetrical attending physician.

Secondary Response
- A Rapid Response Team (RRT) is composed of clinicians that bring critical care expertise to the patient.
- At a minimum, an RRT should include the obstetrical attending physician, anesthesiologist covering obstetrics, and charge nurse.
- This team will assist in stabilizing the patient and determining when transfer to a higher level of care is indicated.

CRICO Example of Trigger Response System

Case Study
Case Study: Patient

- Married, African American woman, 40 years old
- HS: 5 ft 5 in, Weight: 275 lbs, BMI = 45.8
- Family history: Mother coronary artery disease, father chronic hypertension
- OB history:
  - G1 P2
  - Healthy baby girl 7lbs 10oz
- Current pregnancy:
  - BP Range 135-150 / 80-90
  - Nuchal translucency positive
  - Received 2nd trimester screening - Negative

- Medical History:
  - No documentation of elevated pressures prior to pregnancy
  - Smokes ½ pack of cigarettes daily

Is this patient at risk for complications in labor, birth and postpartum?

Pregnancy Risk Factors?

Existing Health Conditions:
- High blood pressure
- Polycystic ovary syndrome
- Diabetes
- Kidney disease
- Autoimmune disease
- Thyroid disease
- Obesity
- HIV/AIDS

Other Considerations:
- Age
- Teen pregnancy
- First time pregnancy
- Age 35
- Lifestyle Factors
  - Alcohol use
  - Cigarette smoking

Conditions of Pregnancy:
- Conditions that can cause complications
- Gestational diabetes
- Preeclampsia and eclampsia

Risk of Fetal Genetic Disorder:
- Older maternal age
- Older paternal age
- Parental carrier of chromosome rearrangement
- Parental aneuploidy or aneuploidy mosaicism
- Prior child with structural birth defect
- Parental carrier of a genetic disorder
- Previous fetus or child with autosomal trisomy or sex chromosome aneuploidy
- Structural anomalies identified by ultrasonography

Risk of Fetal Genetic Disorder:
- Older maternal age
- Older paternal age
- Parental carrier of chromosome rearrangement
- Parental aneuploidy or aneuploidy mosaicism
- Prior child with structural birth defect
- Parental carrier of a genetic disorder
- Previous fetus or child with autosomal trisomy or sex chromosome aneuploidy
- Structural anomalies identified by ultrasonography

Risk of Fetal Genetic Disorder:
- Older maternal age
- Older paternal age
- Parental carrier of chromosome rearrangement
- Parental aneuploidy or aneuploidy mosaicism
- Prior child with structural birth defect
- Parental carrier of a genetic disorder
- Previous fetus or child with autosomal trisomy or sex chromosome aneuploidy
- Structural anomalies identified by ultrasonography
Pregnancy Risk Factors?

**Existing Health Conditions**
- High blood pressure
- Polycystic ovary syndrome
- Diabetes
- Kidney disease
- Autoimmune disease
- Thyroid disease
- Infertility
- Obesity
- HIV/AIDS

**Other Considerations**
- Age
- Last pregnancy
- First pregnancy
- Menstrual age
- Conditions of pregnancy
- Family history
- Previous problems
- Personal smoking

**Risk of Fetal Genetic Disorder**
- Older maternal age
- Older paternal age
- Parental carrier of chromosome rearrangement
- Parental aneuploidy or aneuploidy mosaicism
- Prior child with structural birth defect
- Parental carrier of a genetic disorder
- Previous live or stillborn child with autosomal trisomy or sex chromosome aneuploidy
- Structural abnormality detected by ultrasonography


**Case Continued... Patient Admitted to Labor & Delivery**
- Patient Presents to a Level 2 hospital
- Admitted for Induction of Labor
- GA: 38 5/7
- Cervix: 2/50 High
- VS: 150/110, 110, 20, 98.3
- Denies Vaginal Bleeding, ROM, Headache, Blurred Vision
- Questions?
  - What are our risk factors now?
  - How can we support intended vaginal birth in a patient with risk factors?

**Intrapartum/delivery**
- FHR non-reassuring
- STAT C/S
- Baby boy
- 9 lb 15 oz
- To Special Care Nursery
- EBL: 1000cc in OR

**Postpartum**
- VS: 70/50, 180, 24, 98.9
- Noted continued "Heavy" Lochia
- MD called
- MD in another delivery
- Received order for Hemabate

**Cumulative Blood Loss = 1300 cc**

Are there any triggers present on this slide?
Case Continued... Intrapartum/delivery

Delivery
- FHR non-reassuring
- STAT C/S
- Baby boy
- 9 lbs 15 oz
- To Special Care Nursery
- EBL: 1000cc in OR

Cumulative Blood Loss = 1300 cc

In PACU
- Vaginal bleeding continues, noted by nurse to be moderate to severe
- VS: 130/110, 165, 22, 98.9
- Continue Uterine Massage
- EBL: 200 cc – 300 cc
- Patient deemed stable for transfer to Postpartum Floor
- Cumulative Blood Loss = 1300 cc

Are there any triggers present on this slide?

Case Continued... Intrapartum/delivery

Delivery
- FHR non-reassuring
- STAT C/S
- Baby boy
- 9 lbs 15 oz
- To Special Care Nursery
- EBL: 1000cc in OR

Cumulative Blood Loss = 1300 cc

In PACU
- Vaginal bleeding continues, noted by nurse to be moderate to severe
- VS: 130/110, 165, 22, 98.9
- Continue Uterine Massage
- EBL: 200 cc – 300 cc
- Patient deemed stable for transfer to Postpartum Floor
- Cumulative Blood Loss = 1300 cc

Postpartum
- VS: 70/40, 180, 24, 98.9
- Noted continued “Heavy” Lochia
- MD called
- MD in another delivery
- Received order for Hemabate

Are there any triggers present on this slide?

Case Continued... Patient in Postpartum

- Medications*
- Equipment*
- Staff*
- Response Team
- Patient continues to bleed
Where There Problems with this Case?

- Pregnancy Risk Factors
- Induction of Labor / Supporting Vaginal Birth → reduction of Cesarean births
- Recognition of Complications
- Response to Complications
- Could Maternal Early Warning Systems have made a difference in this case?

Sample MATERNAL Early Warning System

Questions?

- Post your questions in the box...
- Your phone lines will now be open
  - Please make sure your phone is not muted so we can hear your questions!
Directions for After the Webinar:

- Please find the Evaluation form linked with this webinar on the Perinatal Systems website.
- Complete the Evaluation and fax or email to the Perinatal Systems Office
  (Fax: 803-434-4309 / Email: PerinatalSystems@PalmettoHealth.org)
- Please contact our office for any further questions.
  (803.434.2912 / PerinatalSystems@PalmettoHealth.org)
- Thank you for your participation in our archived webinar module.