



ALLIANCE FOR INNOVATION
ON MATERNAL HEALTH



**Maternal Early Warning
System Implementation
Resource Kit**

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Introduction

Maternal mortality is rising in the United States with higher pregnancy-related mortality ratios in rural counties than urban counties.¹ Racial and ethnic disparities in maternal mortality rates persist, as well.² Reviews of pregnancy-related deaths show that more than 80% of these deaths are preventable.³ The most consistent factors leading to maternal mortality and severe maternal morbidity (SMM) have been identified as delays in diagnosis and treatment.⁴ Standardization in protocols to support recognition of evolving maternal health conditions is critical to addressing the leading causes of preventable SMM and maternal mortality in the United States.

The intent of obstetric early warning systems is to alert care providers of potentially impending critical illness and have been found to contribute to improved maternal safety and outcomes.⁵ The Maternal Early Warning System (MEWS) protocol plays an integral role in the early recognition of changes in pregnant and postpartum patient's vital signs and clinical conditions leading to effective escalation and prompt evaluation with the goal of reducing preventable adverse outcomes.

The AIM MEWS Resource Kit contains best practices, resources, and planning materials that can be used by teams in birthing facilities and settings where pregnant and postpartum people receive care.



Resource Kit Information

Resource Kit Scope and Highlights

This resource kit is not intended to be a response manual but rather provides background and resources for implementation of unit and facility MEWS protocol.

This resource kit may particularly benefit clinical units that care for pregnant and postpartum people, specifically obstetric triage, labor and delivery and antepartum units, as well as postpartum settings of care. However, there may be facility wide utility for application of MEWS to medical-surgical units, intensive care and postoperative settings, as well as emergency departments.

Because high quality care is not possible without equitable care, centering equity in quality improvement and implementation of elements of this resource kit is crucial to address inequities that lead to disparities in health outcomes.

Why a resource kit?

The Alliance for Innovation on Maternal Health (AIM) Technical Assistance (TA) Center at the American College of Obstetricians and Gynecologists (ACOG), which is funded through a cooperative agreement with the Health Resources Services Administration, developed this expanded MEWS Resource kit to establish a collection of resources to support facility implementation of MEWS. This expansion and revision was supported by a multidisciplinary working group of subject matter experts and the gracious partnership of the Texas Collaborative for Healthy Mothers and Babies (TCHMB), who had adapted original materials to a Maternal Early Warning Signs System.

Who should use this resource kit?

The resource kit is best used by healthcare professionals, project managers, quality improvement and patient safety professionals, and hospital leadership charged with caring for people who are pregnant and postpartum and may experience conditions that cause or contribute to maternal mortality and SMM. This resource kit may particularly benefit clinical units that care for pregnant and postpartum people, specifically obstetric triage, antepartum, labor and delivery units, as well as postpartum settings of care. However, the optimal goal should be implementation anywhere in a facility that pregnant or postpartum women receive care, including medical-surgical units, intensive care and postoperative settings, as well as emergency departments.

How should this resource kit be used?

This resource kit may be implemented by a facility-based or regionalized interdisciplinary team that includes clinicians, administrators, quality and patient safety professionals, and ancillary and supporting staff. Individuals may use the resource kit for professional development and to prepare themselves to be champions in recognizing and escalating clinical status changes in maternal care.

Resources offered here may be adapted for facility use but are not intended to replace hospital policy, protocol, or guidelines established by a facility or health system. All resources are intended to optimize care for pregnant and postpartum people and support clinicians in efforts to recognize, escalate, and initiate treatment as required for evolving clinical maternal health conditions.

How was this resource kit prepared?

Original Maternal Early Warning Systems (MEWS) protocol and materials were developed by a team of multidisciplinary subject matter experts in 2014 through a working group convened by the National Partnership for Maternal Safety.⁵ Developed to facilitate early recognition of changes in pregnant and postpartum patient's vital signs and clinical conditions, MEWS is intended to facilitate effective escalation and prompt evaluation of patient care concerns and symptoms with the goal of reducing preventable adverse outcomes, including maternal deaths.

Since development of MEWS, the framework has been implemented and evolved with adaptation by a variety of quality improvement initiatives across the United States at the state and facility level. Most notably, the **Texas Collaborative for Healthy Mothers and Babies (TCHMB) adapted original materials to a Maternal Early Warning Signs System** for statewide implementation with resources that include additional supporting documents, audio visual resources, and clinical learning supports which supported effective use of this protocol for facilities across the state of Texas in tandem with AIM Patient Safety Bundle implementation.

Building on the extensive resources prepared by TCHMB, the AIM TA Center convened a work group which included experts from TCHMB. The original materials were reviewed, adapted for current practice, and integrated into this current resource kit.

How is equity integrated into this resource kit?

Respectful, equitable, and supportive care concepts are integrated throughout each section of this resource kit as well as explicitly in the **Respectful Care Section**. Because high quality care is not possible without equitable care, centering equity in quality improvement is crucial to address inequities that lead to disparities in health outcomes. Users are encouraged to prioritize health equity, antiracism, and patient lived expertise in each step of work undertaken in implementing elements of this resource kit. The **Acknowledgements** Section contains the names of those involved in the development of the resource kit.

Resource Kit Key



Examples indicated by this symbol are models of programs, agreements, protocols, and checklists that can be reviewed and adapted to needs and clinical settings.



Resources indicated by this symbol are materials that are ready for immediate use by providers, facilities, and health systems.

References

¹ Centers for Disease Control and Prevention. Pregnancy Mortality Surveillance System. Accessed September 21, 2023. <https://www.cdc.gov/maternal-mortality/php/pregnancy-mortality-surveillance-data/?CDC>

² Hoyert DL. Maternal mortality rates in the United States, 2021. NCHS Health E-Stats. 2023. doi: 10.15620/cdc:124678.

³ Trost SL, Beauregard J, Chandra G, Njie F, Berry J, Harvey A, et al. Pregnancy-Related Deaths: Data from Maternal Mortality Review Committees in 36 US States, 2017–2019. MMWR CDC Surveill Summ. 2022.

⁴ Kilpatrick SJ. Understanding Severe Maternal Morbidity: Hospital-based Review. Clin Obstet Gynecol. 2018;61(2):340-346. doi: 10.1097/GRF.0000000000000351.

⁵ Mhyre JM, D’Oria R, Hameed AB, Lappen JR, Holley SL, Hunter SK, Jones RL, King JC, D’Alton ME. The maternal early warning criteria: a proposal from the national partnership for maternal safety. Obstet Gynecol. 2014 Oct;124(4):782-786. doi: 10.1097/AOG.0000000000000480. PMID: 25198266.



Readiness

Identify Strengths and Weaknesses for MEWS Implementation

When preparing to implement change in systems, identification of strengths and weaknesses in current processes, which may be accomplished through a gap analysis or readiness assessment, supports success. The following gap analysis tool was developed to support a unit or facility-based quality improvement (QI) team in the process of implementing MEWS.

While using this tool, it is recommended to consider the process currently in use in a unit and facility to recognize and report abnormal signs and symptoms. These questions may be answered even if there is not currently a formal MEWS in place.

Consider practices across the continuum of care, for instance in obstetric triage, antepartum, Labor & Delivery, and Postpartum units; if practices are inconsistent between units, specify which unit the answer is referencing.

MEWS-Readiness Assessment

Requirements Every Unit	Consistently In Place	Partially or Inconsistently in Place Ineffective	Not In Place	Comments
Establish a multidisciplinary team of champions				
Identification of trigger that will warrant response				
Oxygen saturation				
Temperature				
Systolic blood pressure				
Diastolic blood pressure				
Heart rate				
Respiration rate				
Urine output				
Mean arterial pressure				
Establish a MEWS notification system				
Establish a MEWS escalation process				

To improve this component, consider creating an action plan for any requirement that is not currently in place and consistently executed.



Examples

Introduction to MEWS Webinar: Webinar presentation slide set developed by TCHMB to introduce the concept of MEWS.

Maternal Early Warning System: Alternate organizational readiness to change assessment pdf tool developed by the Texas perinatal quality collaborative (PQC), TCHMB, for all facilities to use in assessing readiness to implement MEWS.



Resources

Maternity Watch Program: Early Warning Trigger Tool Guide: Implementation guide pdf developed by the Washington Hospital Association to support hospital initiation of Maternal Early Warning Trigger tool.

Maternal Early Warning Criteria: a proposal from the national partnership for maternal safety. 2014 Obstetrics and Gynecology article discussing origin, intent, and initial development of MEWS.

Implementing Obstetric Early Warning Systems: 2018 American Journal of Perinatology Reports article discussing early warning implementation across a broad range of hospital settings.



Recognition and Prevention

Establish and Customize Facility or Health System MEWS Triggers and Protocols

The use of policies, procedures, and checklists in care reduces patient harm and improves outcomes by enhancing standardization and communication.¹ The implementation of MEWS requires facility or health system identification of agreed upon trigger vital signs and symptoms, as well as response protocols. Development and implementation of all aspects of MEWS, including these items, should be multidisciplinary and collaborative. Teams may review and build on their facility's existing strengths and resources to create and revise protocols and procedures for recognition and response to MEWS triggers and potential obstetric emergencies.

All care settings that care for pregnant and postpartum patients or respond to obstetric emergencies should participate in determining triggers and protocols. For more information on response to MEWS triggers and algorithm examples, please see the **Response Section** of this resource kit.

A team working to determine processes to implement MEWS should, at minimum, ascertain:

- ▶ Identified maternal patient populations for application (e.g., gestational parameters, locations of care)
- ▶ Vital sign and symptoms parameters that trigger provider notification
- ▶ Identified responding provider
- ▶ Notification processes (e.g., text alert, paging, calling)
- ▶ Maximum expected provider response time from initial call and arrival to bedside if applicable
- ▶ Timeline for activation of standing orders
- ▶ Standardized escalation plan

MEWS Trigger Criteria Example

MEWS Trigger Criteria

- ▶ SBP <90 or >160
- ▶ DBP > 110
- ▶ HR <50 or >120
- ▶ Oxygen Saturation <95%
- ▶ RR <10 or >30
- ▶ UOP for 2 hours <35cc/hour
- ▶ Maternal agitation, confusion, or unresponsiveness
- ▶ Patient with hypertension reporting a non-remitting headache or shortness of breath

Validate within 5 minutes

Trigger MEWS

Notify Responding Provider*
(and activate standing order if applicable)

Responding provider at bedside within
60 minutes* of the initial MEWS trigger?

NO

Activate MEWS escalation process*

YES

Plan of Care per provider's evaluation

Differential Diagnosis (common and life-threatening conditions)
Integration with hospital QI bundles (e.g. Postpartum Hemorrhage,
Hypertension, Sepsis, Cardiac disease)

Screen for Current or Recent Pregnancy in All Care Settings

To apply MEWS appropriately in all facility care settings, reproductive-aged people should be verbally screened upon presentation to any care setting for current or recent pregnancy. This encompasses, specifically, pregnancy within the last year, regardless of outcome of that pregnancy. Pregnancy or recent pregnancy status may not be readily apparent to healthcare professionals, and patients may not recognize the potential relevance of a current or recent pregnancy to their current symptoms. Finally, patient who experienced a stillbirth or pregnancy loss may not answer “yes” to questions about a delivery, therefore using language surrounding pregnancy timing is important. Due to physiologic changes that occur during and following pregnancy, understanding a person’s pregnancy/postpartum status can help contextualize signs and symptoms, change the differential diagnoses, and help identify potentially life-threatening conditions and the need for escalations in care.²

Screening for this purpose does not include routine blood or urine testing unless otherwise indicated for diagnosis or treatment. Staff and healthcare professionals should verbally screen for current or recent pregnancy in a private area to maintain patient confidentiality and safety. Healthcare professionals should be mindful of relevant laws and regulations surrounding pregnancy reporting and sharing protected health information as they verbally screen any patient.³

Screening for current or recent pregnancy may include asking,

“Are you currently pregnant, or have you been pregnant within the last year?”

Train Healthcare Professionals and Staff to Recognize Obstetric Emergencies Using MEWS

All facility staff who may care for pregnant and postpartum patients should be trained in MEWS triggers and protocols. Staff should also regularly participate in team-based drills and simulations to maintain preparedness for effective recognition and response to obstetric emergencies. Drills may enhance team communication skills, improve response to medical emergencies, and reduce barriers that limit staff communication and patient care.⁴

Key features of effective drills are that they are coordinated, supervised, focus on testing a specific operation or function, and take place in real time.⁵ Drills and simulations may be conducted in a variety of settings such as in-situ, a lab environment, or virtually. Each environment offers different strengths. For example, drills conducted in-situ may better identify barriers in the physical environment, while virtual drills may support increased staff participation and completion.

MEWS triggers and protocols should be built into all drills and simulations related to obstetric emergencies in all settings, including emergency department and critical care settings. Annual staff trainings and competencies may also integrate MEWS. By reinforcing MEWS as part of routine processes, staff may be better prepared to integrate the triggers and protocols into the care of any pregnant and postpartum person. For more information, see **Integration of MEWS into existing training** in the **Response** section of this resource kit.



Resource

AIM MEWS Trigger Criteria Example: pdf sheet with listed MEWS triggers and subsequent steps.



Example

Dignity Health Maternal Triggers Screening Tool: Example form developed by Dignity Health and made available by the Washington Hospital Association to assess for and document MEWS triggers.

MEWS Triggers and Notifications Webinar: Texas Collaborative for Healthy Mothers and Babies developed slide deck in PowerPoint format.

¹ Association of Women's Health, Obstetric and Neonatal Nurses. (2020). Emergency Care for Patients During Pregnancy and the Postpartum Period: Emergency Nurses Association and Association of Women's Health, Obstetric and Neonatal Nurses Consensus Statement. <https://www.awhonn.org/wp-content/uploads/2020/11/ENA-AWHONN-Consensus-Statement-Final-11.18.2020.pdf>

² Soma-Pillay P, Nelson-Piercy C, Tolppanen H, Mebazaa A. Physiological changes in pregnancy. *Cardiovasc J Afr.* 2016 Mar-Apr;27(2):89-94. doi: 10.5830/CVJA-2016-021. PMID: 27213856; PMCID: PMC4928162.

³ U.S. Department of Health & Human Services. HIPAA Privacy Rule and Disclosures of Information Relating to Reproductive Health Care. Accessed September 25, 2023. https://www.hhs.gov/hipaa/for-professionals/privacy/guidance/phi-reproductive-health/index.html#footnote22_yzcmrp

⁴ Preparing for clinical emergencies in obstetrics and gynecology. Committee Opinion No. 590. *American College of Obstetricians and Gynecologists. Obstet Gynecol* 2014;123:722-5. doi: 10.1097/01.AOG.0000444442.04111.c6.

⁵ Emergency Preparedness. California Hospital Association. What is the difference between a tabletop exercise, a drill, a functional exercise, and a full-scale exercise? Accessed September 25, 2023. <https://calhospital.org/what-is-the-difference-between-a-tabletop-exercise-a-drill-a-functional-exercise-and-a-full-scale-exercise/>

Response

Response to the broad and variable nature of obstetric emergencies in any setting requires a high level of coordination, planning, and resource development. Considerations for care may be generalizable or condition specific. Response should include activation of planned response teams and initiation of standard protocols.

Implement MEWS protocols as identified and determined by facility into unit and facility workflows.

Following facility or health system identification of agreed upon trigger vital signs and symptoms, as well as response protocols, all aspects should be integrated into unit workflows. Key components of this integration include electronic health record (EHR) additions and supports, education interventions, and development of resources.

Integrate MEWS Components into EHR

EHR systems can be used to facilitate patient safety and quality improvement (QI) endeavors.¹ Through use of checklists, alerts, measurement, discrete data fields, and other steps a facility may leverage an EHR as a QI support.

For the purposes of implementing MEWS in a facility or health system, there are 3 primary ways this may be accomplished:

1. Addition of MEWS triggers, monitoring, and reporting protocols to existing order sets

A QI team should collaborate with IT and EHR management departments to add MEWS vital signs and other symptom triggers as parameters to all order sets for pregnant and postpartum patients. By embedding MEWS into the order sets, clear guidelines and expectations aligning with policy and protocol are provided for both nursing and ancillary staff, as well as providers.

2. MEWS alerts integration into EHR

MEWS vital sign and symptoms alerts can be built into EHR assessment flowsheets as discrete fields, so that MEWS is considered part of physical assessment for pregnant and postpartum patients. This allows for streamlined nursing documentation and the ability to add alerts when vital signs present outside of established MEWS ranges.

Care should be taken to monitor for team member alert fatigue when integrating EHR alerts for MEWS. Alert fatigue refers to the unintended consequence that has resulted from the many, often clinically inconsequential, alerts that may be generated in an EHR for healthcare professionals daily and the toll this volume of alerts may take.² As team members document in an EHR and are required to mentally sort through a high volume of alerts, the risk of ignoring a critical alert that

should be attended to versus an alert that should be ignored by a clinician grows exponentially.² Considerations for monitoring for alerts and outcomes is further discussed in the **Reporting and Systems Learning** section of this resource kit.

3. Development of templates or “smart text” for documentation

When MEWS activation occurs, documentation of the event by both providers and nursing staff of assessment, interventions, and resolution are essential for both patient care purposes and QI monitoring considerations. The use of standardized protocols and checklists in other disciplines have been shown to improve standardization in care and communication and reduce patient harm, and their use in obstetrics and gynecology is recommended by ACOG.³

Standardization and completion of documentation may be supported by the use of templates or “smart text” additions to an EHR. Smart text refers to preloaded text that can be generated for any MEWS alert or other routine assessment or condition in a narrative portion of an EHR. This text or other templates should be designed to address all aspects of a MEWS event, such as noted trigger, time of provider contact, time of provider response, interventions, and outcome. Of note, we would encourage smart text to include a differential diagnosis section to avoid the cognitive biases associated with techniques such as anchoring bias.

Train all staff to monitor and respond to MEWS criteria and protocols

1. Introduction and Training

All staff should be made aware of the plan to implement MEWS in a facility or unit. Facilitated education sessions or online learning, including understanding of the objectives of MEWS implementation, should be required from those who will be responsible for using MEWS, including all bedside healthcare team members.

An ongoing plan should be made to educate incoming staff members, including clinicians, nursing staff, and students on MEWS as part of routine orientation and onboarding to foster sustainability of use.

Identification of clinical champions to support and reinforce the use of MEWS on all units and during all shifts may also serve to integrate and sustain the effectiveness of MEWS to contribute to a culture of patient safety.

2. Dissemination of algorithms, checklists, and processes materials

All facility MEWS algorithms, checklists, and policies should be readily accessible to all staff members. Materials may include posted algorithms which should be visible at both the bedside and other key locations on patient care units.

A variety of visual aids or prompts such as “badge buddies,” or small cards with MEWS parameters or other key information that fit behind hospital employee identification that is always worn may support easy and rapid access to MEWS information. See the **Recognition and Prevention section** of this resource kit for templates and examples of resources.

3. Integration of MEWS into existing training

Concepts and processes of MEWS should be added to unit-based drills, simulations, and routine trainings such as Advanced Cardiac Life Support trainings or unit-specific education or skills days. MEWS is not intended to be used in isolation, but rather as a tool in a broader set of interventions for patient safety.

Assessment of MEWS criteria as part of routine patient assessment, like the act of obtaining the vital signs that are used for MEWS assessment, allows the healthcare team to identify changes in patient status rapidly. Other opportunities to incorporate MEWS include facility AIM patient safety bundle implementation trainings and provider education offerings. Because assessment is a key component to nearly all simulation and training interventions, these provide a unique opportunity to model and demonstrate incorporation of MEWS into unit and facility processes.

Finally, as obstetric teams implement new quality initiatives including AIM bundles, alignment with the existing MEWS can help with the readiness and recognition aspects.



Examples

AIM Maternal Early Warning Signs Example Protocol

Dignity Health Maternal Early Warning Trigger (MEWT) Algorithm: Example algorithm designed and developed by Dignity Health and made available by the Washington Hospital Association for response to MEWS triggers.

Maternal Early Warning Rural Facility Escalation Algorithm Example: Example algorithm developed by the Washington Hospital Association for use in a rural healthcare facility

Maternal Early Warning Tertiary Care Facility Escalation Algorithm Example: Example algorithm developed by the Washington Hospital Association for use in a tertiary care healthcare facility

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¹ Silow-Carroll S, Edwards JN, Rodin D. Using electronic health records to improve quality and efficiency: the experiences of leading hospitals. Issue Brief (Commonw Fund). 2012 Jul;17:1-40. PMID: 22826903.

² Agency for Healthcare Research and Quality' Patient Safety Network. Alert Fatigue.. Accessed October 14, 2023. <https://psnet.ahrq.gov/primer/alert-fatigue>

³ Clinical guidelines and standardization of practice to improve outcomes. ACOG Committee Opinion No. 792. American College of Obstetricians and Gynecologists. Obstet Gynecol 2019;134:e122-5.

Reporting and Systems Learning

Conduct Huddles and Post-Event Debriefs for MEWS Events

Huddles

Daily huddles or safety huddles are an essential component of safety culture in high reliability organizations. Huddles are “standing meetings” that occur at a consistent time, ideally twice in a 24-hour period for 5–7 minutes and may coincide with the start of a new staffing shift.¹ During daily huddles leaders can share critical information with the entire team, such as changes in staffing, supplies, or processes.² This awareness and shared mental model may support optimized care if a MEWS-related event occurs during a shift. A huddle can be called at any point in a MEWS event, including a developing clinical scenario, needs for escalation in care, or ongoing concern from any healthcare team member, including the patient.

Debriefs

Post-event debriefs in healthcare are brief, directed conversations that should be held following all patient safety issues, errors, near misses, or significant clinical events.³ This type of conversation, which should include as many of those who provided care or were involved in the event as possible, reviews the timeline of a MEWS-related event and summarizes actions taken during care. Next, a debrief identifies successes, barriers, and opportunities that can be rapidly addressed to improve care in the future.⁴

Perform Reviews of MEWS-Related Events Per Established Facility Criteria to Identify System Issues

Review of care during a MEWS-related event beyond an initial debrief is critical to improving obstetric care. Reviews can consider key elements of care, such as transport times, patient outcomes, and any team concerns. All reviews should be seen as a learning opportunity to improve care.⁵

Any event review undertaken should be anchored in a Just Culture approach. A Just Culture can be modeled by evaluating systems and processes that may have contributed to a negative or positive outcome and avoiding shame and blame directed toward individuals for systems failures.⁶

Use of event assessment tools or checklists can add standardization to this process, allow for evaluation of unintended quality improvement project outcomes, and support development of clear pathways for systems improvements.

Monitor Data Related to MEWS-Related Events with Disaggregation at Minimum by Race and Ethnicity

Overall, MEWS-related events response and outcomes in a facility or health system should be monitored in an ongoing way. As discussed in the **Response** section of this resource kit, alert fatigue is a concern when implementing a tool such as MEWS. Monitoring of data, such as false positive triggers, false negative triggers, and other reoccurring factors allows for early identification of potential staff alert fatigue. These reviews may also present an opportunity for assessment of accuracy and utility of facility or system-identified MEWS triggers. Volume of events, trends in cases, delays in care, response, or recognition, and any noted disparities in outcomes related to patient population, demographics, or care location should be noted. Identification of these factors provide opportunities for targeted further quality improvement efforts, including staff education and training to address bias and foster a culture of antiracism.

Nearly all causes of maternal mortality and morbidity show racial and ethnic disparities due to health inequities.⁷ In order to adequately address this in quality improvement, such as implementation of MEWS or patient safety bundles, it is necessary to closely examine outcomes and processes to assure equity in care and correction of any noted disparities. This type of continuous analysis is required to successfully intervene and improve quality of care to minimize or eliminate disparities.⁸



Resource

Patient Safety and the Just Culture: this journal article from *Obstetrics and Gynecology Clinics of North America* provides a thorough and accessible grounding in concepts of Just Culture



AIM Post MEWS Event Assessment Tool

Safe Deliveries Roadmap Maternity Watch Program: MEWT Screen Summary Review Sheet a brief Maternal Early Warning Trigger implementation tool designed by the Washington Hospital Association to collect measure program data

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- ⁷ Howell EA. Reducing Disparities in Severe Maternal Morbidity and Mortality. *Clin Obstet Gynecol.* 2019;61(2):387-399. doi: 10.1097/GRF.0000000000000349.
- ⁸ Davidson C, Denning S, Thorp K, Tyler-Viola L, Belfort M, Sangi-Haghpeykar H, et al. Examining the effect of quality improvement initiatives on decreasing racial disparities in maternal morbidity. *BMJ Qual Saf.* 2022;31:670-678. doi: 10.1136/bmjqs-2021-014225

Respectful, Equitable, and Supportive Care



While MEWS protocols and triggers are designed to optimize patient care through recognition of and response to early warning signs and symptoms, the first and best identifier and reporter of warning signs remains the patients themselves.

While MEWS criteria include patient reports of symptoms as a critical trigger, it must be recognized that other patient reports of concerns, symptoms, or observations are critical to early recognition and management of conditions that lead to maternal mortality and severe maternal morbidity. However, to be effectively recognized and conditions intervened upon, healthcare team members must be able to recognize, truly hear, and attend to these patient reports.

Recognize Patients and Their Support Network as True Experts

Recognizing and establishing the patient and their support network as true experts in their own experience in all aspects of care, including team communications such as safety huddles and other essential information exchanges, is fundamental to optimal care. By doing this, the care team cocreates an opportunity to develop and implement a standardized care plan to improve outcomes with the patient.¹ Excellent clinician-patient communication is essential in provision of safe, high quality, and respectful patient care, which includes operationalization of respectful care.²

Provide Patient Education on Urgent Signs and Symptoms

Reviews of maternal mortality in the United States highlight the need to provide patient education on the early warning signs of life-threatening complications.³ Education on warning signs is also reported by patients as an important tool to determine the need to seek care.⁴

Education on signs and symptoms of concern in pregnancy and postpartum should be shared early and often with all people seeking obstetric care. Provided resources should indicate whether concerns may be appropriately addressed in any settings where pregnant or postpartum people seek care or if specialized obstetric care is needed. All education provided should be aligned with a patient's health literacy, culture, language, and accessibility needs, and include a designated support person for all teaching as desired.

Education opportunities should be extended to the pregnant or postpartum person's support network, which may include partners, family, and friends, and may be incorporated into standard admission and discharge processes from both obstetric care and non-obstetric care settings.

Table 1 provides examples of patient education materials, including their costs to access, if any and whether they are available in other languages. These resources can be given to patients to take home for future reference and posted publicly in triage areas.

Table 1. Examples of Patient Education Materials for Urgent Signs and Symptoms During Pregnancy and Postpartum

Patient Education Material	Costs Associated with Use	Available in Languages Other in English
CDC HEAR HER Campaign	No	Yes
AWHONN POST-BIRTH Warning Signs	Yes	Yes
Urgent Maternal Warning Signs	No	Yes



Examples

AIM Urgent Maternal Warning Signs: materials developed to provide patient facing education information in a low literacy format and variety of languages. Materials include templates for posters, cards, badge buddies, and ability to request additional language translation.

Centers for Disease Control and Prevention (CDC)'s Hear Her Campaign: a campaign developed to support identification of urgent signs and symptoms in pregnancy and postpartum and the need to seek care. Includes healthcare professional-facing materials, including posters and palm cards, underlying the importance of asking patients about current or recent pregnancy.

Reproductive Health National Training Center's Recognize Postpartum Warning Signs Poster: a non-obstetric healthcare professional-facing poster developed as a visual aid for clinicians and unlicensed ancillary team members on urgent maternal warning signs to be aware of in the postpartum period.

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Appendix A. Maternal Early Warning Signs Implementation Readiness Assessment

Readiness Assessment

The purpose of this readiness assessment is to support a facility's understanding of current status in the process of implementing MEWS. To complete, think about the processes currently in use in obstetric units and other place pregnant and postpartum people receive care to recognize and report abnormal signs and symptoms. These questions may be answered even if a facility does not have a formal MEWS in place. Consider practices in all units; if practices are inconsistent between units, specify which unit the answer is referencing.

MEWS-Readiness Assessment

Requirements Every Unit	In Place Consistently Executed	In Place Ineffective	Not In Place	Comments
Establish a multidisciplinary team of champions				
Identification of trigger that will warrant response				
Oxygen saturation				
Temperature				
Systolic blood pressure				
Diastolic blood pressure				
Heart rate				
Respiration rate				
Urine output				
Mean arterial pressure				
Establish a MEWS notification system				
Establish a MEWS escalation process				

To improve this component, consider creating an action plan for any requirement that is not currently in place and consistently executed.

MEWS-Recognition & Prevention Assessment

Requirements Every Patient	In Place Consistently Executed	In Place Ineffective	Not In Place	Comments
Validation of MEWS triggers				
Bedside evaluation after MEWS has been triggered				

To improve this component, consider creating an action plan for any requirement that is not currently in place and consistently executed.

MEWS-Response Assessment

Requirements Every Hemorrhage	In Place Consistently Executed	In Place Ineffective	Not In Place	Comments
Unit standard protocol/algorithm in response to MEWS trigger				
Unit-standard MEWS escalation plan				
Use of chain of command if concerned with patient management				
A rapid response process that is accessible and responsive to maternity unit patients				
Support program for patients, families and staff for all significant complications				

To improve this component, consider creating an action plan for any requirement that is not currently in place and consistently executed.

MEWS-Reporting/Systems Learning Assessment

Requirements Unit	In Place Consistently Executed	In Place Ineffective	Not In Place	Comments
Education around MEWS				
Components of MEWS included in EHR				
Establish a culture of huddles for high risk patients and post-event debriefs to identify successes and opportunities				
Multidisciplinary review of serious complications for systems issues				
Audit compliance with MEWS				
Track obstetrical outcomes after a MEWS trigger				

To improve this component, consider creating an action plan for any requirement that is not currently in place and consistently executed.

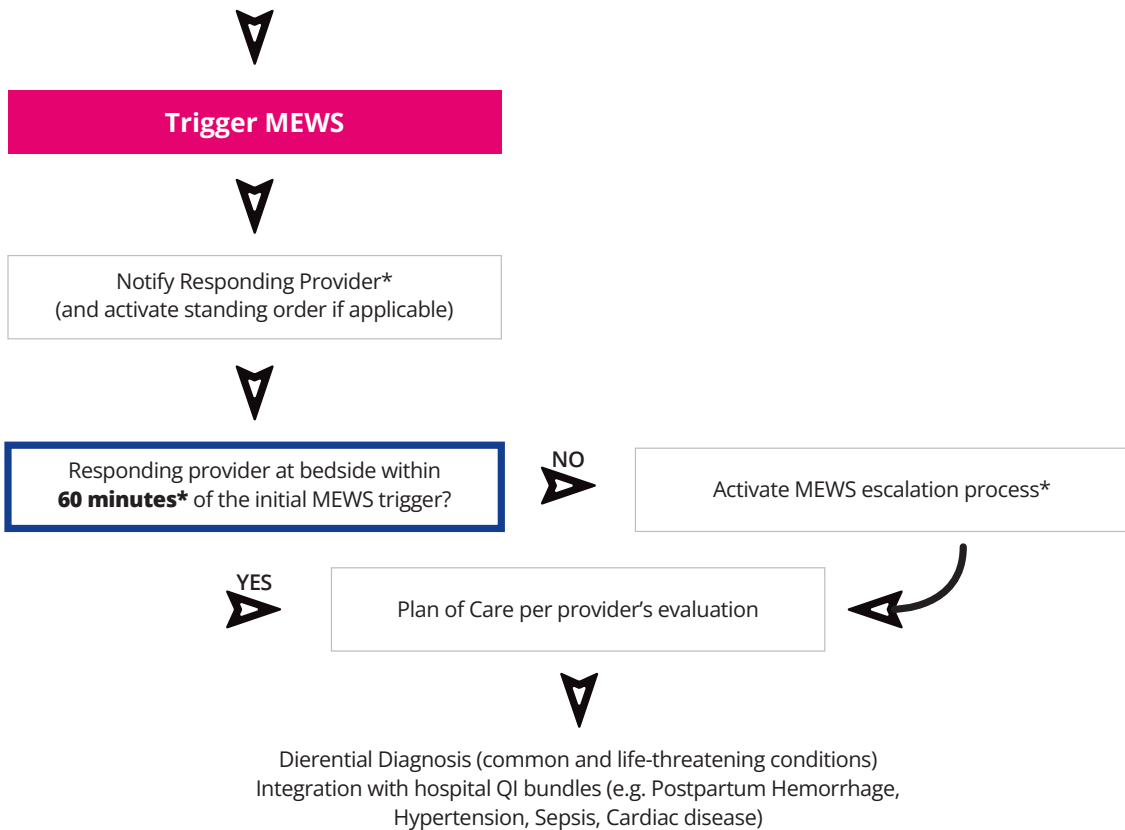


Appendix B. MEWS Trigger Criteria Example

MEWS Trigger Criteria

- ▶ SBP <90 or >160
- ▶ DBP > 110
- ▶ HR <50 or >120
- ▶ Oxygen Saturation <95%
- ▶ RR <10 or >30
- ▶ UOP for 2 hours <35cc/hour
- ▶ Maternal agitation, confusion, or unresponsiveness
- ▶ Patient with hypertension reporting a non-remitting headache or shortness of breath

Validate within 5 minutes



Appendix C. Maternal Early Warning Signs (MEWS) Example Protocol

1. Immediate action is required when any of the MEWS criteria are triggered per facility protocol

Items that are not in the lower box should be confirmed, within 10 minutes, prior to calling the physician.

Not applicable for BP systolic <90 when ≤30 min post epidural and anesthesiologist present

2. When immediate action is required:

Proceed with facility MEWS plan or guideline such as:

- ▶ If the attending physician is immediately available, he/she will provide bedside evaluation of the patient within 10 minutes. The in-house OB will be notified to provide bedside evaluation if the attending physician is not at the bedside within 5 minutes.
- ▶ If the attending physician is not immediately available, the RN will call the in-house OB to provide bedside evaluation of the patient within 10 minutes. The attending physician or CNM will also be notified of the patient's status. If the CNM is notified, he/she will notify the attending physician.
- ▶ If in-house OB is called but not immediately available, he/she will receive a verbal report and determine what further action is necessary.

3. When immediate action is required:

- ▶ Differential diagnosis (the RN will provide this protocol and a differential diagnosis list to the bedside).
- ▶ Planned frequency of monitoring and re-evaluation.
- ▶ Criteria for immediate physician notification.
- ▶ Any diagnostic or therapeutic interventions.
- ▶ "Huddle" participants and summary of management plan.

The physician will communicate the assessment and plan via a "huddle." Huddle participants include the Primary RN, the Charge RN, the Anesthesiologist, the attending physician if present, and the in-house OB.

4. If MEWS trigger(s) persists, after corrective and supportive measures taken, appropriate consultation and planning should be undertaken which may include:

- ✓ Maternal fetal medicine consultation
- ✓ Critical care medicine consultation
- ✓ Activation of a facility Rapid Response Team
- ✓ Planning for appropriate setting of ongoing care, such as higher acuity unit (ICU, telemetry) or initiation of potential planning for transfer to a higher level of maternal care

5. Depending on the clinical evaluation, patient laboratory and diagnostic studies to consider include:

- ✓ Add cardiac monitoring
- ✓ CBC
- ✓ Type and screen or type and cross match if bleeding
- ✓ CMP
- ✓ Magnesium level
- ✓ Pulse oximeter
- ✓ 12-lead EKG, particularly in the presence of tachycardia, bradycardia, or chest pain
- ✓ CT angiogram or perfusion scan in patients with acute chest pain
- ✓ CXR if the patient has SOB, particularly if pre-eclamptic
- ✓ Echocardiogram

Example MEWS Triggers

Systolic BP; mmHg	<90 or >160
Diastolic BP; mmHg	>100
Heart rate; bpm	<50 or >120
Respiratory rate; bpm	<10 or >30
Oxygen saturation; %	<95
Oliguria; ml/hr x 2h	<35
Maternal agitation, confusion, or unresponsiveness	
Patient with hypertension reporting a non-remitting headache or shortness of breath	

6. If primary RN and charge nurse have ongoing concerns related to any aspect of the patient's care and an issue is unresolved with the attending physician:

An escalation pathway must be initiated to both an identified physician leader or executive and a nurse leader as appropriate in the chain of command with immediate notification. Nursing supervisor on shift will also be notified.



Appendix D. Post MEWS Event Assessment Tool

Patient name: _____ Date of admission: _____
 Patient MRN: _____ Date of discharge: _____
 Patient location: _____

- Answer the following questions based on the above MEWS trigger criteria:
 - Patient DID NOT screen positive (based on internal MEWS criteria and policy) for any trigger during the admission: **STOP HERE**
 - Patient DID screen positive (Based on internal MEWS criteria and policy) on any criteria: **CONTINUE**
- Check the criteria below that screened positive (if multiple MEWS criteria were triggered simultaneously, check all that apply):

<input type="checkbox"/>	Low SBP Trigger	<input type="checkbox"/>	Low HR Trigger	<input type="checkbox"/>	Urine Output Trigger
<input type="checkbox"/>	High SPB Trigger	<input type="checkbox"/>	High HR Trigger	<input type="checkbox"/>	Maternal agitation, confusion or unresponsiveness
<input type="checkbox"/>	High DBP Trigger	<input type="checkbox"/>	Low RR Trigger	<input type="checkbox"/>	Patient with preeclampsia reporting a non-remitting headache or SOB
<input type="checkbox"/>	O ₂ sat Trigger	<input type="checkbox"/>	High RR Trigger	<input type="checkbox"/>	Other: _____

- Date of initial trigger: _____
- Time of initial trigger: _____
- Time of provider notification: _____
- Name of provider who was notified: _____
- Time of provider at bedside: _____
- Name of provider who came to bedside: _____
- Time of return of abnormal vital sign to non-trigger range: _____
- If the time period in which the provider was at the bedside is >60 minutes or determined facility criteria, what was the reason for delay?
 - The patient care/medical assistant did not notify the RN of the MEWS trigger
 - The RN did not notify the responding provider of the MEWS trigger
 - The responding provider could not be reached, and the RN failed to activate the escalation process
 - The responding provider could not come to the bedside, and the RN failed to activate the escalation process
 - The responding provider gave verbal orders over the phone instead of coming to the bedside
 - Other: _____

11. Was the patient transferred to a higher level of care?
- Yes, to ICU
 - Yes, to Labor & Delivery
 - Yes, to a different facility
 - No
 - Unable to determine
12. Did the patient receive > 4 units of PRBCs during intra- or postpartum?
- Yes
 - No

The following questions are for the purposes of a retrospective chart review.

13. Did the nurse document the MEWS trigger in the EHR?
- Yes
 - No
 - Unable to determine
14. Did the nurse document the notification to the provider in the EHR?
- Yes
 - No
 - Unable to determine
15. Did the nurse document the time of the provider at bedside in the EHR?
- Yes
 - No
 - Unable to determine
16. Did the provider document the MEWS encounter in the EHR?
- Yes
 - No
 - Unable to determine



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