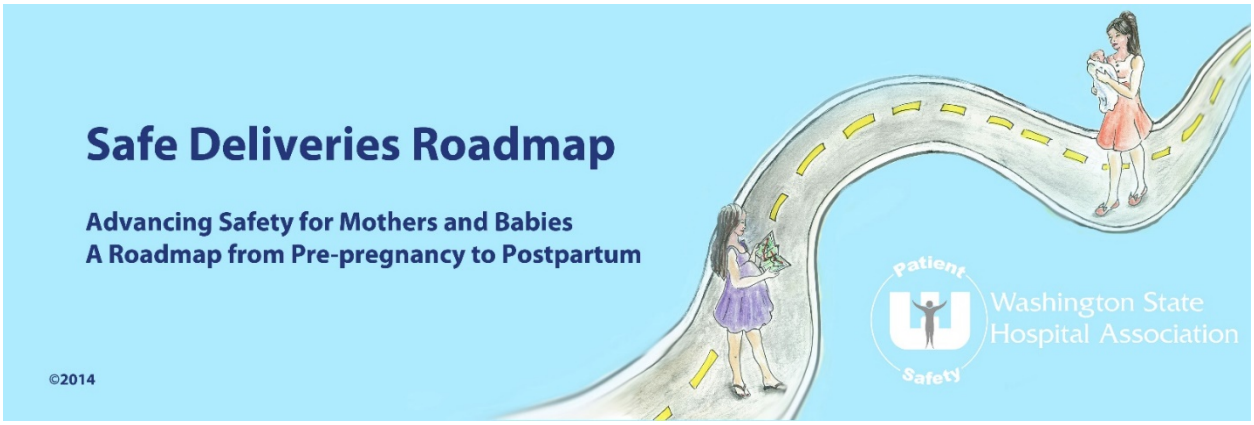


Maternity Watch:

Improving Patient Outcomes by Creating Cultures of Early Detection and Response

This guide and the companion workbook are designed to serve as a resource to Project Team Leaders in implementing the Maternity Watch program and Maternal Early Warning Trigger (MEWT) tool at their facility.

BACKGROUND

The Maternal Mortality rate has doubled in United States in the last decade, placing it among the worst performers of developed countries. Causes are attributed to Early Elective Deliveries, higher incidences of cesarean sections, more cases of severe pre-eclampsia, and complications from other co-morbidities. Occurring in conjunction to an increase in mortality is a rise in maternal morbidity. Investigations of these cases find that many of them could have been prevented. [1-5]

A potential challenge for hospitals is to identify the patients who are at risk for maternal morbidity and to administer timely interventions. To address this, early warning systems have been developed.

In review of the available systems, and after conducting a pilot to assess feasibility, the Safe Deliveries Roadmap decided on the Maternal Early Warning Trigger (MEWT) as the system to adopt region-wide to impact our maternal morbidity and mortality rates. The MEWT is a clinical pathway specific trigger tool developed by Larry Shields, MD, to address the most common causes of maternal morbidity: hemorrhage, pre-eclampsia, sepsis and cardiopulmonary dysfunction. [6]

ORGANIZATION OF THE GUIDE

This guide is designed as a resource for program leaders, providers and staff interested in successfully implementing an evidence-based screening, notification and intervention system to prevent unnecessary maternal morbidity.

The guide is organized as follows:

- **Purpose:** Outlines the goals of the guide and initiative.
- **Getting Started**: Identifies the key components for developing a strong foundation for implementing the Maternal Early Warning Trigger (MEWT) tool. It covers evaluating your readiness for change, the impact of the practice change, anticipating challenges, assembling your project team and engaging your stakeholders.
- **Applying the Practices**: Describes the model and approach for the practice change, along with the supporting tools for implementation.
- **Measurements and Data Collection:** Outlines the project measurement and data collection system.
- **Resources:** Lists project related tools and references.

PURPOSE

The purpose of this implementation guide is to describe the elements that are needed for successful implementation of the MEWT, that will facilitate prompt and reliable recognition of and response to clinical deterioration in maternity patients. The guide outlines steps and provides resources to leaders for creating a recognition and response system tailored to their maternity care population.

GETTING STARTED

EVALUATING READINESS

Clinical practice changes have a profound impact on your maternity unit and how you prepare for it will determine your success. Readiness is defined as the degree to which your clinicians are predisposed to support, ignore or resist your change initiative.

For readiness, there needs to be a link between past, present and future capabilities. Research shows that people are ready to support change when they are clear about their strengths and positively acknowledged for their contributions. Leaders can garner support for change by connecting clinicians to the need for practice change, appreciating their contributions, involving them in the planning and creating an energizing change process.

It is important to take time to evaluate your unit's readiness for the change. And then to address any barriers you discover as part of your change process plan.

Use the **Practice Change Success Assessment** in the companion workbook to understand your strengths and opportunities. The goal of this assessment is to understand your gaps before you embark on your change initiative.

UNDERSTANDING THE IMPACT OF THE CHANGE

Because leaders are concerned with implementing the best practices to improve patient care they often concentrate on the technical aspects of the change and overlook how the practice change will affect the people who will be implementing it. A well-designed strategy for change links the technical aspects (e.g., protocol) with the human aspects (e.g., emotions and motivation).

A human-focused change approach encourages clinician input early in the planning process. This is a critical period for gaining credibility among the people who will be implementing the change and to identify benefits, challenges and objections so stakeholders can be prepared for what lies ahead. Planning change this way requires more effort on the front end but it is well worth the effort because it prevents incomplete implementations and/or rework on the backend due to unanticipated obstacles and resistance. Additional rewards for taking this approach are the good will, trust and collaboration it engenders.

To assess the impact of your change initiative, see the **Change Impact Assessment** in the companion workbook.

ANTICIPATING AND ADDRESSING THE CHALLENGES

Implementing the MEWT protocol successfully requires addressing the challenges inherent in the change of practice, work flow and culture the protocol entails. It is important to think through how you will address the challenges before you encounter them.

The table below outlines challenges you may encounter, along with strategies to address them.

	Challenge	Strategies
Concerns about:	Additional time needed for paper format until electronic system is developed	• Describe the benefits and challenges with MEWT implementation, including time needed to imbed in EMR • Convey the benefit of using paper first to work through work flow impacts before the EMR is changed • Identify and work through anticipated bottlenecks caused by paper process
	Oversensitivity, leading to unnecessary calls to providers	• Present others' experiences with call impact (see ***FAQs*** document) • Conduct small test of change to discover impact in your maternity unit
	Strength of evidence for practice change	• Refer to the ***Reference*** section of this implementation guide with evidenced based articles
Lack of:	Clinician participation	• See ***Impact of Change*** and ***Evaluating Readiness*** sections this guide and companion workbook • See ***Creating Cultures of Change*** section of this guide • Develop plans to address weaknesses (see workbook)
	Resources (human and technological)	• See ***Impact of Change*** and ***Evaluating Readiness*** sections in this guide and companion workbook • Communicate to decision makers the need for practice change and required resources
	Supportive culture (e.g., nurses comfort level speaking up when concerned)	• See ***Impact of Change*** and ***Evaluating Readiness*** sections in this guide and companion workbook • See ***Creating Cultures of Change*** section of this guide
Breakdowns in:	Accurate patient observations	• Perform audits • Review results with stakeholders • Develop plans for celebrations and/or improvements
	Timely notification	• Perform audits • Review results with stakeholders • Develop plans for celebrations and/or improvements
	Timely response	• Perform audits • Review results with stakeholders • Develop plans for celebrations and/or improvements
	Appropriate diagnostics and follow up	• Perform audits • Review results with stakeholders • Develop plans for celebrations and/or improvements
Unintended consequences:	Overdependence on triggers and not using critical judgement	• Perform audits • Review results with stakeholders • Develop plans for celebrations and/or improvements

Use the **Anticipating and Addressing Challenges Worksheet** in the companion workbook.

CREATING CULTURES OF CHANGE

Organizational culture effects efforts to implement change because it comprises the values, beliefs, perceptions and expectations of organization members. A supportive culture has been cited as one of the most important components of successful practice change. It relates to organizational members' ability to adapt to rapidly changing demands and to sustain optimal patient outcomes. There is no "right" culture to have and there is no single formula for achieving it. However, there are characteristics of culture that are attributed to organizations that are more successful at making changes in practice.

- **Focus:** Due to the number of changes happening in hospitals, loss of focus is a significant cause of failure to sustain practice changes. It is important to carve out enough time to carry out the phases of the change process (readiness, small tests of change, hard-wire). Participating in practice change collaboratives is an effective strategy to maintain focus.
- **Inclusive decision and planning:** Top down decision making where leaders make the practice change plans and then "sell" it to the clinicians bodes poorly for practice change success. Including representatives of key stakeholder groups in the decision and planning process will create ownership among those who will be most impacted by the practice change.
- **Incremental change:** In complex environments, like hospitals, change needs to be approached incrementally to avoid procrastination and unintended consequences. Small tests of change allow for rapid learning and adjustments over time to achieve longer term goals.
- **Measuring the process of change as well as the outcomes:** Practice changes often entail substantial changes in clinician behavior. To initiate and hardwire these changes, in addition to outcome measures (e.g., patient outcomes), clinician behavioral measures should be monitored (e.g., using new forms, taking new actions, etc.).

ENGAGING YOUR STAKEHOLDERS

Assembling your project team

The degree to which you can engage your key stakeholder groups determines the degree of your practice change success. The engagement starts with building your project team. Their role is to provide council, develop the proposed practice change strategy, exert influence at key moments and remove obstacles.

For your project to be effective, you need to select people with the needed skills, knowledge and influence.
Use the criteria below to select your project team members.

Project Team Member Characteristics

Characteristic	Description
Influence	• Has a formal leadership role • Is an informal leader • Has influence in unit cliques and affiliations
Specialized Knowledge	• Has direct experience with one or more aspects of the problem • Understands the context of the problem • Understands the consequences of failing to solve the problem
Collaboration Skills	• Treats others with respect • Is reliable • Is an effective communicator • Is flexibly minded and can consider alternative points of view
Problem Solving Skills	• Shows commitment to the problem to be solved • Arrives at the best solution by trusting the group process • Uses critical thinking, i.e., thinks about ways of thinking rather than perpetuating common perceptions

Use the **Project Team Member Worksheet** in the companion workbook.

Engaging and communicating with your key stakeholder groups

Although time consuming, communicating and engaging with your key stakeholder groups regularly is critical for your practice change to gain and sustain momentum. Developing **key messages** and **communication plans** will enable you to do this successfully.

Key Messages:	• Translate your practice change into terms that make sense to your stakeholder groups • Define the issue, outline the problem, explain the solution, describe the benefits and challenges and inspire collective action • Are most effective when they are developed by your project team members, used by all leaders and advocates and communicated consistently
Communication Plan:	Due to its importance, the plan for communicating and engaging your stakeholder groups should command the same amount of attention as your practice change strategy plan. It should include: • Your message • Modes of communication (e.g., face to face, emails, etc.) • Timelines (how, when and how often to engage) • Feedback loops (how will you know your engagement is successful?)

Use the **Communication Plan Worksheet** in the companion workbook.

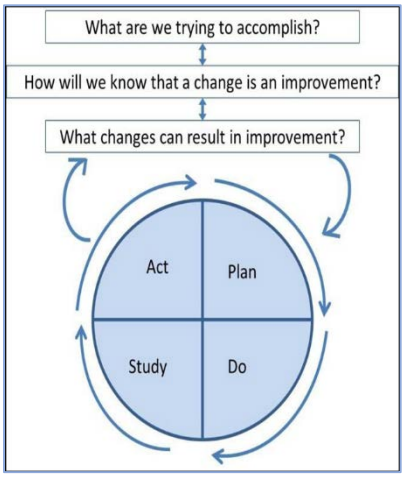
PLANNING FOR SUSTAINABILITY

Planning for sustainability at the start of a project is key to "sustain the gains" achieved. There are several good resources outlining how to plan for sustainability, including Institute for Healthcare Improvement's Sustainability and Spread How-to-Guide.[7]

Component	Examples
Supportive Management Structure	Leadership buy-in and support; accountability for improvement
Structures to "Foolproof" Change	Building structures that make it difficult to revert to previous habits; "hardwiring" processes and tools to support sustained implementation of the intervention.
Robust, Transparent Feedback Systems	Measurement systems, data reports and transparency across the organization.
Shared Sense of the Systems to be Improved	All stakeholders share an understanding of the program goals and structure, how they contribute and hold each other accountable.
Culture of Improvement and a Deeply Engaged Staff	Staff are broadly aware of the program and feel invested in program outcomes. See also "Creating Cultures of Change" section above.
Formal Capacity-Building Programs	Give staff the training and skills they need to be successful in achieving and sustaining program goals. Team Leaders consider the composition and skill base of their teams, working to enhance confidence and competency.

APPLYING THE PRACTICES

THE ACTION PLAN



It is important to use a proven model for change. The Plan, Do, Study, Act (PDSA) cycle is the most commonly used approach for rapid cycle improvement in health care. This method has four repeated steps; Plan, Do, Study, and Act. The PDSA steps support organizational learning through experimentation to make improvements. In this model, suggested solutions are tested on a small scale before changes are made to the whole system.

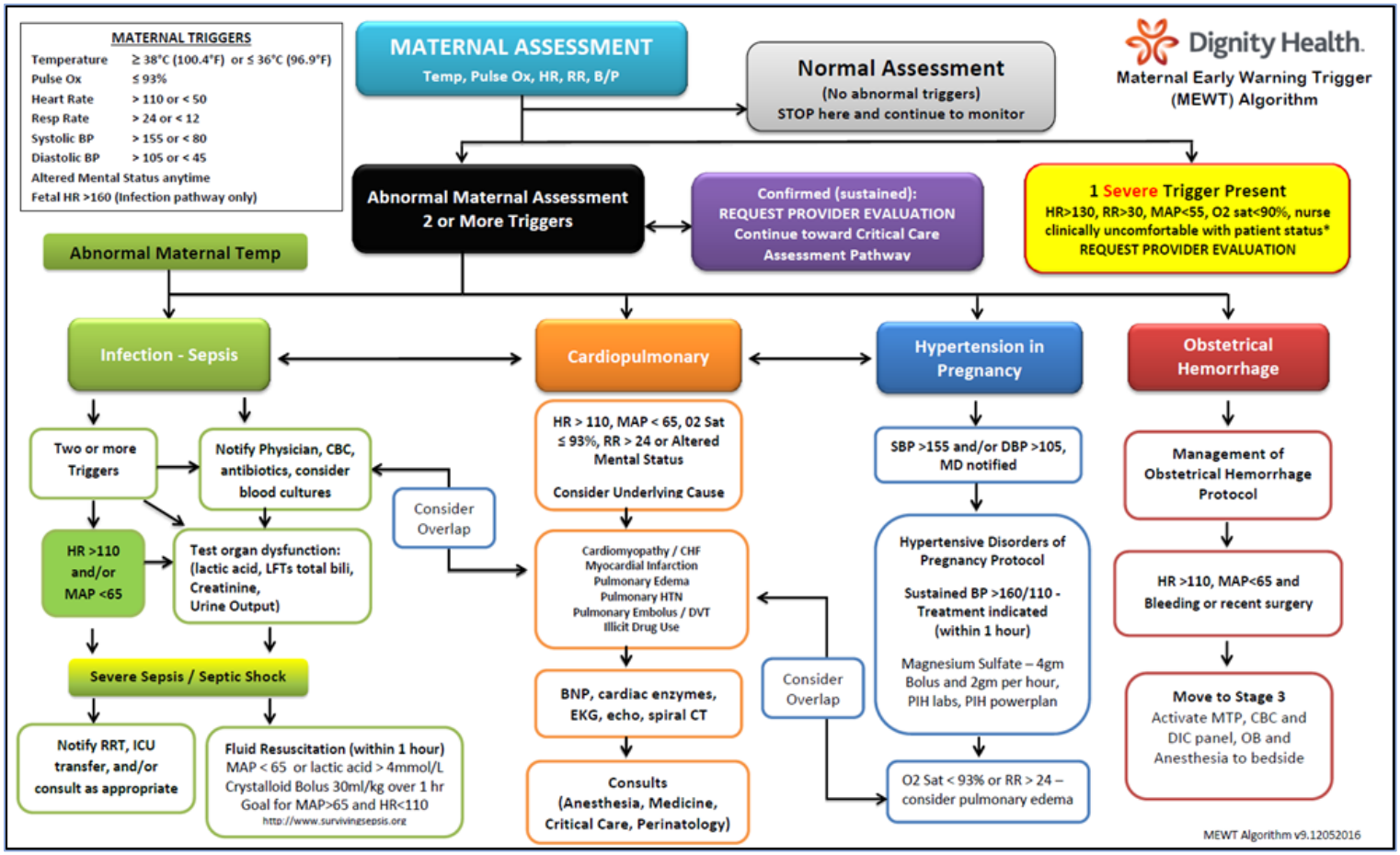
Using this model in applying the MEWT protocol, it is recommended the MEWT tools are used with a small group of clinicians first, allowing the maternity care team a chance to test the new process before using the tools more broadly.

Use the **Tests of Change Worksheet** in the companion workbook.

THE MATERNAL EARLY WARNING TRIGGER (MEWT) ALGORITHM AND TOOL

Larry Shields, MD, Medical Director, Perinatal Safety at Dignity Health developed and tested the MEWT algorithm and tool within the Dignity Health system in California. The results of his work have been published and demonstrate the success of the tool and algorithm in early identification of maternal warning signs and reduction of maternal morbidity (http://www.wsha.org/wp-content/uploads/Shields-article.pdf).

Use the algorithm below for early detection, response and interventions for the four most common maternal morbidities: sepsis, cardiopulmonary disorders, hypertension and hemorrhage (http://www.wsha.org/wp-content/uploads/Maternal-Triggers-Algorithm-Modified-DRAFT-v9.pdf)



The trigger screening tool may be found via this link: http://www.wsha.org/wp-content/uploads/Maternal-Triggers-Screening-Tool-v11-PILOT.pdf

THE MATERNAL EARLY WARNING TRIGGER PARAMETERS

Dr. Shields and his team developed the following protocol which outlines the early warning trigger parameters and associated pathways: http://www.wsha.org/wp-content/uploads/DignityHealth-MEWTS-White-Paper-FINAL-8.2017.pdf

Below are the maternal trigger parameters contained in Dr. Shields' protocol:

Recommendations

Early Identification

- Implementation of a standardized tool to identify maternal triggers
- Sucessful management requires correctly identifying patients who may have signs of clinical deterioration, providing standardized treatement in response to specified triggers for one of four common pathways: Infection/Sepsis, Cardiopulmonary Dysfunction, Hypertension in Pregnancy and Obstetrical Hemorrhage
- Abnormal vitals signs require **validation** and should be repeated within 15 minutes to confirm.
- Validated abnormal vitals signs are considered **sustained** when there are consecutive abnormal values at least 15 minutes apart. The presence of sustained triggers should be used in the Maternal Early Warning Trigger system guidelines.
- Provider notification with the identification of A) a single Severe Maternal Trigger or B) at least 2 ore more Maternal Triggers.
    - **Severe Maternal Triggers:**
        - Heart Rate > 130
        - Respiratory Rate > 30
        - Mean Arterial Pressure (MAP) < 55
        - pO2 Saturation < 90%
        - Systolic BP ≥ 160
        - Diastolic BP ≥ 110
        - Nurse clinically uncomfortable with patient status
    - **Maternal Triggers:**
        - Temperature ≥ 38°C (100.4°F) or ≤ 36°C (96.9°F)
        - pO2 Saturation ≤ 93%
        - Heart Rate > 110 or < 50
        - Respiratory Rate > 24 or < 12
        - Systolic BP > 155 or < 80
        - Diastolic BP > 105 or < 45
        - Altered Mental Status
        - Fetal HR > 160 (infection pathway only)

Dignity Health – Perinatal Safety – Standardized Practices: Maternal Early Warning Trigger (MEWT) System White Paper FINAL (8.2017)

Maternal triggers lead to four possible pathways, which specify additional evaluation and treatment guidelines:

Dignity Health

Four Pathways - Additional Evaluation and Treatment Guidelines

Infection / Sepsis

2 or more triggers including Abnormal Maternal Temperature

Refer to system Sepsis Identification and Management guidelines.
Notify provider and consider the following:

- Initial CBC and blood cultures.
- Consider antibiotics, if appropriate.
- If Maternal HR > 110 and/or MAP < 65:
    - Additional labwork to include lactic acid, liver function tests, total bili, creatinine
    - Measure urine output

  Consider Severe Sepsis / Septic Shock
    - If lactic acid > 4 mmol/L and/or MAP < 65
    - Notify Rapid Response
    - Consider transfer to ICU and/or consult
    - Fluid resuscitation (within 1 hour) with 30ml/kg crystalloid
    - Goal for MAP > 65 and HR < 100
- Consider overlap with Cardiopulmonary Dysfunction pathway

Cardiopulmonary Dysfuntion

HR > 110, MAP < 65, O2 Sat ≤ 93%, RR > 24 or alterned mental status

Notify provider and consider the following:

- Consider underlying causes:
    - Cardiomyopathy / CHF
    - Myocardial Infarction
    - Pulmonary Edema
    - Pulmonary Hypertension
    - Pulmonary Embolus / DVT
    - Ellicit Drug Use
- Consider additional consults:
    - Anesthesia
    - Medicine
    - Critical Care
    - Perinatology
- Consider overlap with Infection / Sepsis or Hypertension in Pregnancy pathways

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Hypertension in Pregnancy

SBP > 155 and/or DBP > 105 – notify provider SBP > 160 and/or DBP > 110 – treatment indicated

Refer to system "Hypertensive Disorders of Pregnancy" guidelines (2014).
Notify provider and consider the following:

- If SBP > 160 and/or DBP > 110 or severe features (headache, visual disturbances, epigastric pain, etc):
  - Administration of IV antihypertensives
  - Magnesium sulfate 4gm bolus and 2gm / hour
  - Labwork: CBC, liver function tests, creatinine
  - Measure urine output
- If O2 Sat , 93% or RR > 24, consider pulmonary edema
- Consider overlap with Cardiopulmonary Dysfunction pathway

Obstetrical Hemorrhage

HR > 110, MAP < 65 and Bleeding or Recent Surgery

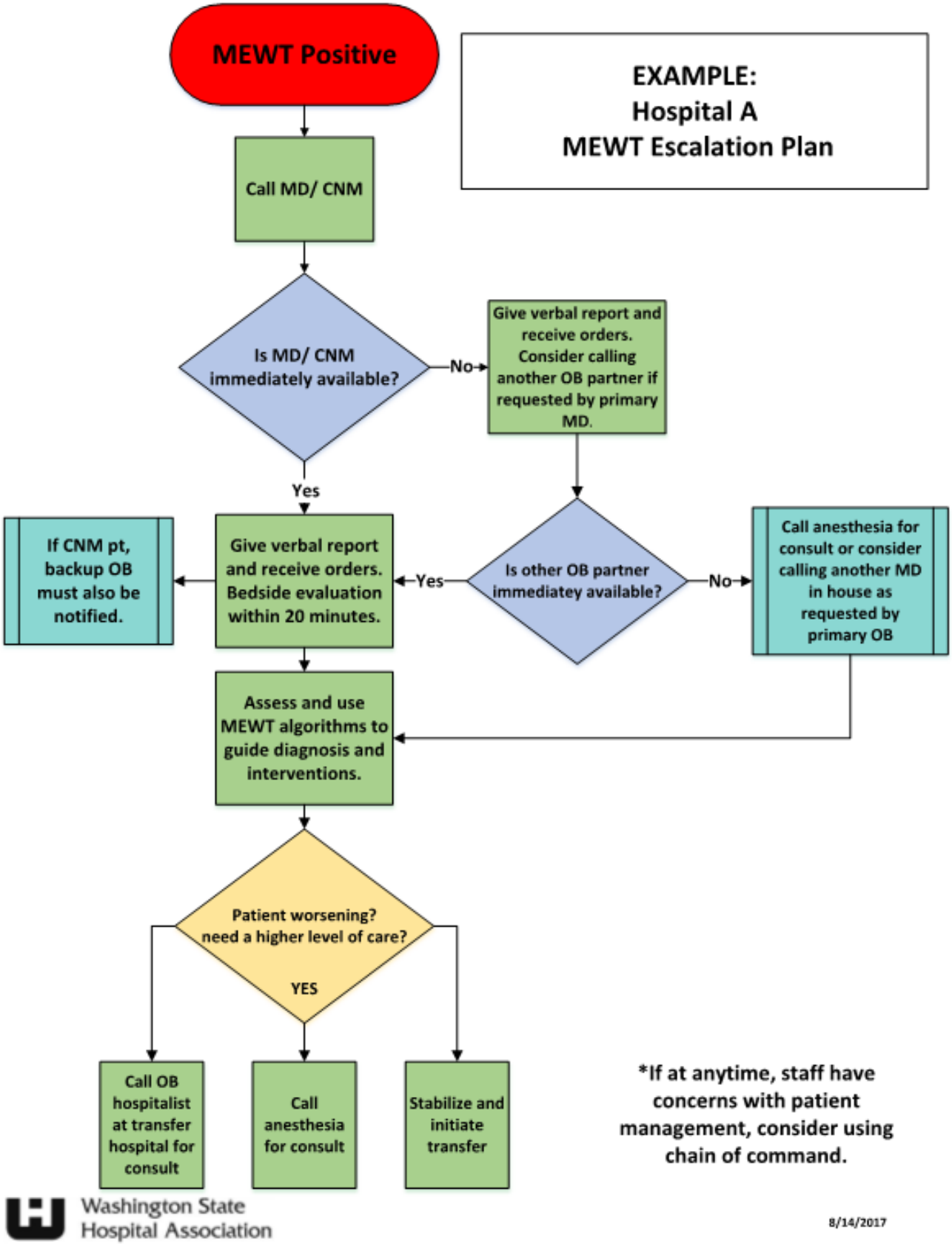
Refer to system "Management of Obstetrical Hemorrhage" guidelines (2012).
Notify provider and consider the following:

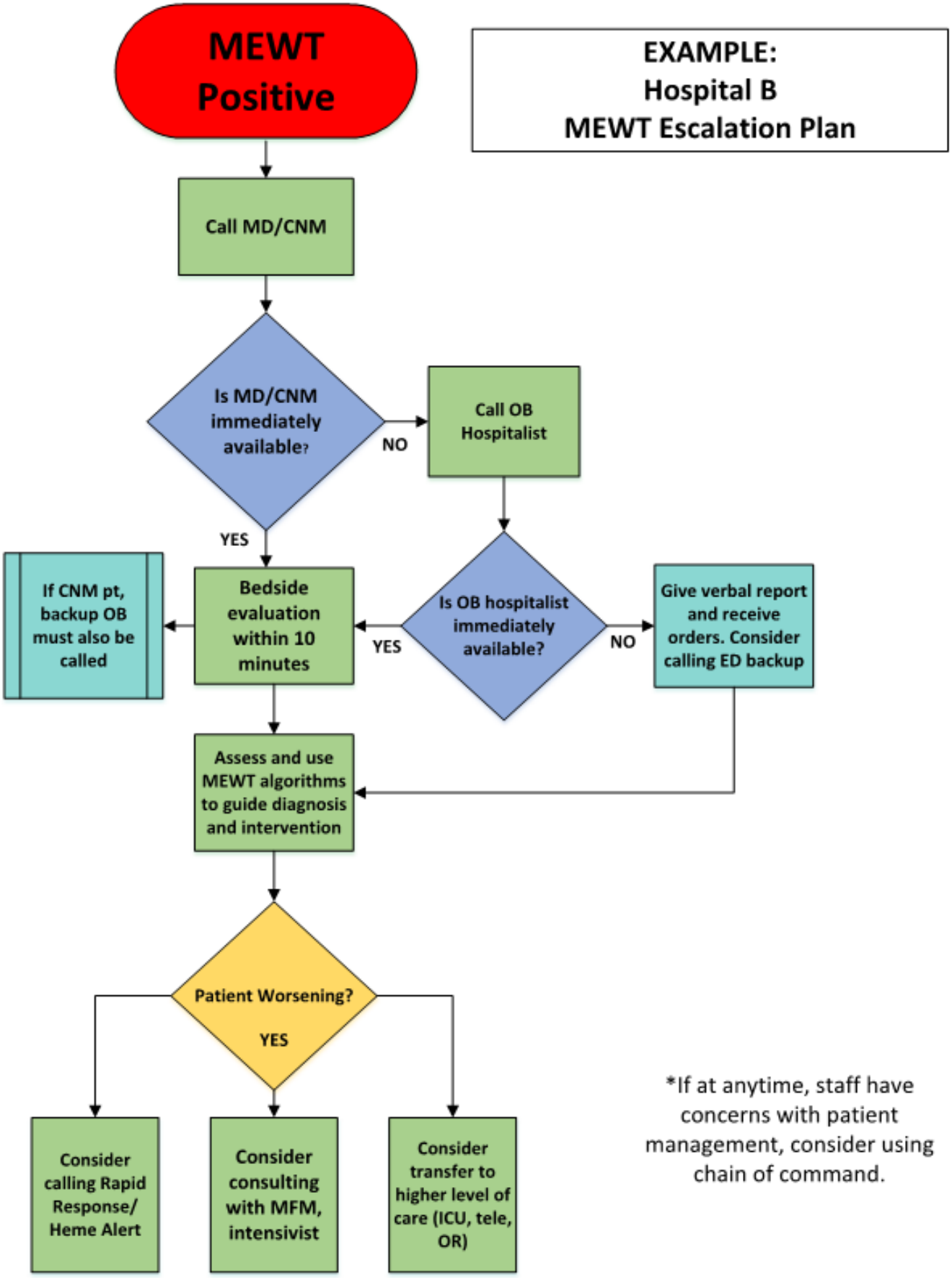
- Activate Massive Transfusion Protocol, as defined in Stage 3 hemorrhage guidelines:
  - Labwork: CBC, DIC panel
  - OB and Anesthesia providers to bedside

Dignity Health – Perinatal Safety – Standardized Practices: Maternal Early Warning Trigger (MEWT) System White Paper FINAL (8.2017)

ESCALATION ALGORITHMS:

It is important to standardize the pathway for medical evaluation and resource activation when a positive MEWT trigger is identified. Two examples are provided below:




MEWT Positive
EXAMPLE:
Hospital B
MEWT Escalation Plan
Call MD/CNM
Is MD/CNM immediately available?
NO
Call OB Hospitalist
YES
If CNM pt, backup OB must also be called
Bedside evaluation within 10 minutes
YES
Is OB hospitalist immediately available?
NO
Give verbal report and receive orders. Consider calling ED backup
Assess and use MEWT algorithms to guide diagnosis and intervention
Patient Worsening?
YES
Consider calling Rapid Response/ Heme Alert
Consider consulting with MFM, intensivist
Consider transfer to higher level of care (ICU, tele, OR)
*If at anytime, staff have concerns with patient management, consider using chain of command.
Washington State Hospital Association
8/14/2017

MEASUREMENTS AND DATA SUBMISSION

- **MEASURES DEFINTIONS**: Lists the project measure, numerator, and denominator definitions.
- **DATA COLLECTION**: Describes the project data collection requirements and system
- **REPORTS**: Explains the content, frequency, and audience of the benchmark reports

RESOURCES (located in the companion workbook)

The Maternal Early Warning Trigger Implementation Workbook includes:

- **Practice Change Success Assessment**: Assesses a maternity unit's strengths and opportunities as they relate to successful practice change.
- **Change Impact Assessment**: Assesses the impact of the planned practice change so obstacles can be addressed before you embark on your change initiative.
- **Anticipating and Addressing Challenges Worksheet**: Provides spaces to write down the challenges you anticipate from implementing the MEWT protocol and your plans for addressing them.
- **Project Team Member Worksheet**: Provides spaces to write down your selected project team members.
- **Communication Plan Worksheet**: Provides space to write down the your communication plan you will use to engage your stakeholders.
- **Planning for Sustainability Checklist**: Identifies components for sustainability that are in place and those that need to be developed.
- **Maternal Early Warning Trigger Tool Algorithm**: Outlines the work flow for activities necessary for early identification, response and intervention for sepsis, cardiopulmonary disorders, hypertension and hemorrhage.
- **Maternal Early Warning Trigger Tool Parameters**: Describes the parameters for early identification, response and intervention for sepsis, cardiopulmonary disorders, hypertension and hemorrhage.
- **Escalation Algorithms**: Sets out the organizational response required to address different levels of abnormal physiological measurements and observations.
- **Tests of Change Worksheet**: Provides spaces to write out plans for your small tests of change.

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