

OBSTETRICAL HARM CHANGE PACKAGE

Recognition and Prevention of Obstetrical Related Events and Harm

2014 UPDATE



American Hospital
Association



HRET
HEALTH RESEARCH &
EDUCATIONAL TRUST
In Partnership with AHA

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The AHA/HRET HEN would like to acknowledge our partner, Cynosure Health, for their work in developing the Obstetrical Harm Change Package.

OVERVIEW

Background

- The maternal mortality rate in the United States has DOUBLED in the last decade. Possible causes for this increase include Early Elective Deliveries, a higher incidence of C-sections, more cases of severe pre-eclampsia, and complications from other co-morbidities.
- Additionally, severe maternal morbidity is 50 times more common than mortality, and often goes unnoticed until it is too late to prevent outcomes that include lifelong disability.
- The biggest challenge for hospitals is to identify those patients at highest risk for maternal morbidity and imminent risk for harm, and to implement strategies in a timely manner to mitigate those risks

Recommended AIM:

- By December 31, 2014, all hospitals will observe a 40% decrease in the number of women requiring 4 or more transfusions of any blood product in the post-partum period.
- By December 31, 2014, all hospitals will show a 40% decrease in the number of days spent in the ICU by pregnant women with pre-eclampsia during their hospitalization.

Potential Measurement(s):

Outcome: The number of women who received 4 or more units of any blood product during the postpartum hospitalization (EOM 118).

Process: The number of women admitted to the Labor and Delivery unit whose risk of OB hemorrhage has been assessed and recorded in the medical record (EOM 116).

Process: Patients with elective vaginal deliveries or elective cesarean sections at ≥ 37 and < 39 weeks of gestation completed (EOM 40).

Outcome: All newborns who have birth trauma (EOM 48).

Outcome: Number of patients with a C-Section procedure (EOM 49).

Outcome: All vaginal delivery patients who have 3rd or 4th degree OB trauma with an instrument-assisted delivery (EOM 54).

Outcome: All vaginal delivery patients who have 3rd or 4th degree OB trauma (EOM 55).

Outcome: Total number of blood products used per 100 women giving birth (EOM 117).

Process: Has your hospital implemented protocol/checklists (including order sets) for treating severe hypertension and using magnesium sulfate in obstetrics? (EOM 119).

Outcome: Days since last event (Rural/CAH Data Collection Tool)

KEY ELEMENTS	IDEAS TO TEST
Standardize readiness for obstetric emergencies	<ul style="list-style-type: none"> • Have emergency supplies and medications readily available through the use of standardized hemorrhage and magnesium carts or kits. • Keep a hemorrhage kit in the medication delivery station. • With the assistance of physicians, nurses, and blood bank staff, develop a hospital protocol for the response to hemorrhage using an evidence-based example such as the Maternal Hemorrhage Toolkit found at www.CMQCC.org. • Use policies, protocol examples, practice bundles, educational materials and data collection tools that are already created and available publicly from organizations like CMQCC and IHI • Unless contraindicated, place sequential compression devices on all cesarean delivery patients.
Standardize recognition of obstetric emergencies	<ul style="list-style-type: none"> • Utilize equipment such as drapes with a calibrated collection system that can accurately measure blood loss in lieu of estimating blood loss. • Implement an evidence-based trigger tool for the diagnosis and treatment of hemorrhage and severe pre-eclampsia in obstetric patients • Evaluate every obstetric patient for risk of VTE using a standardized assessment tool. • Use standardized language to describe the amount of blood loss, the severity of pre-eclampsia, and fetal heart tracings for communications among the treatment team and with the blood bank.
Standardize responses to obstetric emergencies	<ul style="list-style-type: none"> • Place copies of the hospital's hemorrhage protocol in prominent places in each patient room. • Schedule and conduct regular simulation drills with physicians and nurses to practice the response to obstetric emergencies such as hemorrhage or shoulder dystocia. Use feedback from the post-event debriefing to revise and improve future responses. • Conduct a thorough debriefing after each actual and simulated emergency to identify areas needing improvement, and to obtain suggestions for future exercises. • Allow all team members the opportunity to speak and to offer suggestions at each debriefing.

Making Changes

- Research has demonstrated that the use of a proven improvement model is necessary to be able to achieve and sustain improvement. Examples of such models include The Model for Improvement, LEAN, and Six Sigma. Additional information about these models is available at: www.IHI.org.

Resources

- The California Maternal Quality Care Collaborative Maternal Hemorrhage Toolkit. Retrieved at: www.CMQCC.org
- The California Maternal Quality Care Collaborative Severe Pre-eclampsia Toolkit. Retrieved at: www.CMQCC.org
- Institute for Healthcare Improvement. Retrieved at: www.IHI.org
- The Society for Hospital Medicine Guide for Preventing Hospital Acquired VTE. Retrieved at: <http://www.hospitalmedicine.org/AM/Template.cfm?Section=Home&Template=/CM/ContentDisplay.cfm&ContentID=17773>

Background

The 20th century saw a dramatic decrease in pregnancy-related deaths, largely because of improvements in sterile techniques — reaching the lowest number in 1987 at 7.2 deaths per 100,000 live births. Unfortunately, the most recent figures available show the rate currently hovers around 15 deaths per 100,000 births — placing the U.S. near the bottom among developed nations in this regard. According to a 2012 federal study, the rate of severe complications during and after delivery has doubled in the last decade. Near-misses, where a woman nearly dies, increased by 27 percent.

As a result, each year in the U.S., about 700 women die of pregnancy-related complications, and 52,000 experience emergencies such as acute renal failure, shock, respiratory distress, aneurysms, and heart disease requiring surgery. An additional 34,000 women barely avoid death. (Lyndon A L. , 2010)

Additionally, severe maternal morbidity is 50 times more common than maternal death. In the National Hospital Discharge Survey from 1991-2003, it was estimated that the severe maternal morbidity rate in the U.S. was 5.1 per 1,000 deliveries. (Callaghan WM, 2008) There is also growing evidence that maternal morbidity may be increasing in the U.S.. Data from the 1998– 2005 Nationwide Inpatient Sample of the Healthcare Cost and Utilization Project show that the prevalence of delivery hospitalizations complicated by at least one severe obstetric complication increased from 6.4 per 1,000 deliveries (n = 48,645) in 1998– 1999, to 8.1 per 1,000 deliveries (n = 68,433) in 2004–2005. (Kuklina E, 2009) Rates of complications that increased significantly during the study period included renal failure (increased by 21%, from 0.23 to 0.28), pulmonary embolism (increased by 52%, from 0.12 to 0.18), adult respiratory distress syndrome (increased by 26%, from 0.36 to 0.45), shock (increased by 24%, from 0.15 to 0.19), blood transfusions (increased by 92%, from 2.38 to 4.58), and ventilation (increased by 21 %, from 0.47 to 0.57).

The top 3 causes of maternal morbidity and mortality are postpartum hemorrhage, severe pre-eclampsia and obstetric VTE. Recognition, response and readiness to treat these conditions are the keys to decreasing obstetric mortality and morbidity. (Main EK, 2011) In addition to the “Three R’s” (Readiness, Recognition and Response), hospitals that have implemented the following safety bundles and tools are better positioned to treat and prevent maternal morbidity:

- Postpartum Hemorrhage Safety Bundle
- VTE Prevention Safety Bundle
- Severe Pre-Eclampsia Safety Bundle
- Maternal Early Warning Criteria (trigger tool)

REDUCTION OF OBSTETRIC HARM DRIVER DIAGRAM - MATERNAL HEMORRHAGE

AIM: Reduce Obstetric Harm by 40% by December 8, 2014

PRIMARY DRIVERS	SECONDARY DRIVERS	CHANGE IDEAS
Standardize readiness for obstetric emergencies	<ul style="list-style-type: none"> Implement standardized care delivery systems 	<ul style="list-style-type: none"> Have emergency supplies and medications readily available through the use of standardized hemorrhage carts or kits. Keep a hemorrhage kit at the medication delivery station. With the assistance of physicians, nurses, and blood bank staff, develop a protocol for responses to hemorrhage using an evidence-based example, such as the Maternal Hemorrhage Toolkit found on www.CMQCC.org. Use policies, protocol examples, practice bundles, educational materials, and data collection tools that have already been created and are publicly available from organizations such as CMQCC and IHI.
Standardize recognition of obstetric emergencies	<ul style="list-style-type: none"> Implement standardized early warning systems to identify high-risk patients 	<ul style="list-style-type: none"> Instead of estimating blood loss, utilize equipment that can identify and quantify blood loss, such as drapes with a calibrated collection system. Implement a tool that uses evidence-based triggers for the diagnosis and treatment of hemorrhage in obstetric patients. Use standardized language to describe the amount of blood loss and fetal heart tracings in communications among the treatment team and with the blood bank.
Standardize responses to obstetric emergencies	<ul style="list-style-type: none"> Implement and test standardized protocols for obstetric emergencies 	<ul style="list-style-type: none"> Place copies of the hemorrhage protocol in prominent places in each patient room. Conduct drills regularly with physicians and nurses to simulate obstetric emergencies. Conduct a thorough debriefing after each actual and simulated emergency to identify areas needing improvement and obtain suggestions for improving future exercises. Allow all team members the opportunity to speak and offer suggestions at each debriefing.

REDUCTION OF OBSTETRIC HARM DRIVER DIAGRAM - SEVERE PRE-ECLAMPSIA

AIM: Reduce Obstetric Harm by 40% by December 8, 2014

PRIMARY DRIVERS	SECONDARY DRIVERS	CHANGE IDEAS
Standardize readiness for obstetric emergencies	<ul style="list-style-type: none"> Implement standardized care delivery systems 	<ul style="list-style-type: none"> Have emergency supplies and medications readily available through the use of standardized magnesium carts or kits. Keep a severe pre-eclampsia medication toolkit at the medication-delivery station. With the assistance of physicians and nurses, develop a protocol for the response to severe pre-eclampsia using an evidence-based example, such as the Severe Pre-eclampsia Toolkit found on www.CMQCC.org. Use policies, protocol examples, practice bundles, educational materials, and data collection tools that have already been created and are publicly available from organizations like CMQCC and other state and national agencies.
Standardize recognition of obstetric emergencies	<ul style="list-style-type: none"> Implement standardized early warning systems to identify high-risk patients 	<ul style="list-style-type: none"> Implement a tool with evidence-based triggers for the diagnosis and treatment of severe pre-eclampsia in obstetric patients. Use standardized language to describe the severity of pre-eclampsia and fetal heart tracings in communications among the treatment team.
Standardize responses to obstetric emergencies	<ul style="list-style-type: none"> Implement and test standardized protocols for obstetric emergencies 	<ul style="list-style-type: none"> Schedule simulation drills on a regular basis to practice the response to obstetric emergencies such as hemorrhage, and use the feedback from a debriefing after the event to improve future exercises. Conduct a thorough debriefing after each actual and simulated emergency to identify areas needing improvement and obtain suggestions for the future. Allow all team members the opportunity to speak and offer suggestions at each debriefing.

REDUCTION OF OBSTETRIC HARM DRIVER DIAGRAM - OB VENOUS THROMBOEMBOLISM (VTE) DRIVER DIAGRAM

AIM: Reduce Obstetric Harm by 40% by December 8, 2014

PRIMARY DRIVERS	SECONDARY DRIVERS	CHANGE IDEAS
Standardize readiness for obstetric emergencies	<ul style="list-style-type: none"> Implement standardized care delivery systems 	<ul style="list-style-type: none"> Have medications readily available through the use of standardized VTE prophylaxis kits. Keep a hemorrhage kit at the medication delivery station. With the assistance of physicians and nurses, develop a hospital protocol for the assessment and treatment of patients at risk for VTE. Use policies, protocol examples, practice bundles, educational materials, and data collection tools that have already been created by organizations such as IHI and are publicly available. Unless contraindicated, place sequential compression devices on the lower extremities of all cesarean delivery patients.
Standardize recognition of obstetric emergencies	<ul style="list-style-type: none"> Implement standardized early warning systems to identify high-risk patients 	<ul style="list-style-type: none"> Evaluate each obstetric patient for risk of VTE using a standardized assessment tool. Use standardized language to describe maternal condition and fetal heart tracings in communications among the treatment team.
Standardize responses to obstetric emergencies	<ul style="list-style-type: none"> Implement and test standardized protocols for obstetric emergencies 	<ul style="list-style-type: none"> Include the VTE prophylaxis protocol as part of the risk assessment and orders. Schedule simulation drills to practice responding to obstetric emergencies on a regular basis, and use feedback from debriefings after the events to improve future exercises. Conduct a thorough debriefing after each actual or simulated emergency to identify areas needing improvement and obtain suggestions for revisions. Allow all care team members the opportunity to speak and offer suggestions at each debriefing.

SUGGESTED AIM STATEMENT

By December 2014, hospitals in the AHA/HRET Hospital Engagement Network will reduce obstetric-related mortality and/or severe morbidity by 40%.

POST-PARTUM HEMORRHAGE (PPH)

Postpartum hemorrhage (PPH) affects 1-3% of pregnancies in the first 24 hours after birth and is a leading cause of pregnancy-related mortality in both developing and developed countries. Deaths due to PPH have declined in developed countries because hospitals have easier access to blood products, but PPH-related morbidities have remained constant, and include massive transfusions, secondary surgical procedures, ICU admissions and fertility loss. The risk of hemorrhage is always present at birth, but early

identification allows earlier intervention that may prevent major blood loss. Early intervention requires the following:

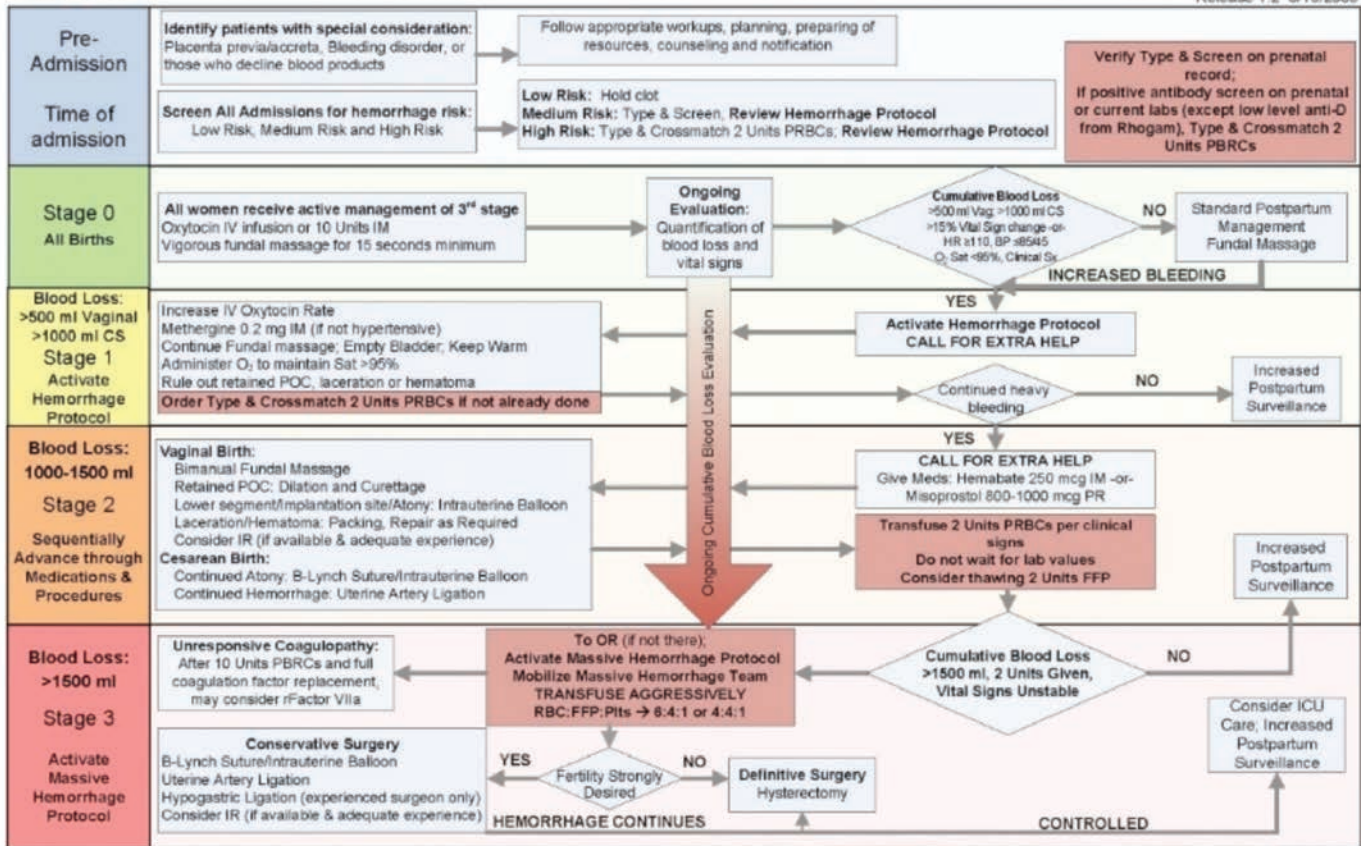
- 1) a recognition of risk factors that trigger heightened surveillance;
- 2) a standardized approach to estimating blood loss; and
- 3) the use of clinical evaluative thresholds – typically vital signs – as triggers or alerts.

Though efforts to standardize treatment abound, relatively few institutions have created a systematic PPH protocol for early recognition and rapid response. This deficit is due in part to the broad range of clinical risk factors involved in PPH, the lack of standardized methods for estimating blood loss, and the lack of a “gold standard” for defining PPH. (Lyndon A L., 2010)

CMOCC. Obstetric Hemorrhage Care Guidelines: Table Chart Format Revised 1.0 01/09

	Assessments	Meds/Procedures	Blood Bank
Stage 0	Every woman in labor/giving birth		
<i>Stage 0 focuses on risk assessment and active management of the third stage.</i>	<ul style="list-style-type: none"> Assess every woman for risk factors for hemorrhage Ongoing quantitative evaluation of blood loss on every birth 	Active Management 3rd Stage: <ul style="list-style-type: none"> Oxytocin IV infusion or 10u IM Fundal Massage- vigorous, <u>15 seconds min.</u> 	<ul style="list-style-type: none"> If Medium Risk: T&C Scr If High Risk: T&C 2 U If Positive Antibody Screen (prenatal or current, exclude low level anti-D from RhoGam): T&C 2 U
Stage 1	Blood loss: >500 ml vaginal or >1000 ml Cesarean, or VS changes (by >15% or HR ≥110, BP ≤85/45, O2 sat <95%)		
<i>Stage 1 is short: activate hemorrhage protocol, initiate preparations and give Methergine IM</i>	<ul style="list-style-type: none"> Activate OB Hemorrhage Protocol and Checklist Notify Charge nurse, Anesthesia Provider VS, O2 Sat q5' Calculate cumulative blood loss q5-15' Weigh bloody materials Careful inspection with good exposure of vaginal walls, cervix, uterine cavity, placenta 	<ul style="list-style-type: none"> IV Access: at least 18gauge Increase Oxytocin rate, and repeat fundal massage Methergine 0.2mg IM (if not hypertensive) May repeat if good response to first dose, BUT otherwise <u>move on</u> to 2nd level uterotonic drug (see below) Empty bladder: straight cath or place foley with urimeter 	<ul style="list-style-type: none"> T&C 2 Units PRBCs (if not already done)
Stage 2	Continued bleeding with total blood loss under 1500ml		
<i>Stage 2 is focused on sequentially advancing through medications and procedures, mobilizing help and Blood Bank support, and keeping ahead with volume and blood products.</i>	<ul style="list-style-type: none"> OB back to bedside (if not already there) Extra help: 2nd OB, Rapid Response Team (per hospital), assign roles VS & cumulative blood loss q 5-10 min Weigh bloody materials Complete evaluation of vaginal wall, cervix, placenta, uterine cavity Send additional labs, including DIC panel If in Postpartum: Move to L&D/OR Evaluate for special cases: <ul style="list-style-type: none"> -Uterine Inversion -Amn. Fluid Embolism 	<ul style="list-style-type: none"> 2nd Level Uterotonic Drugs: <ul style="list-style-type: none"> Hemabate 250 mcg IM <u>or</u> Misoprostol 800-100 mcg PR 2nd IV Access (at least 18gauge) Bimanual massage Vaginal Birth: (typical order) <ul style="list-style-type: none"> Move to OR Repair any tears D&C: no retained placenta Place intrauterine balloon Selective Embolization (Interventional Radiology) Cesarean Birth: (still intra-op) (typical order) <ul style="list-style-type: none"> Inspect broad lig, posterior uterus and retained placenta B-Lynch Suture Place intrauterine balloon 	<ul style="list-style-type: none"> Notify Blood Bank of OB Hemorrhage Bring 2 Units PRBCs to bedside, transfuse per clinical signs – do not wait for lab values Use blood warmer for transfusion Consider thawing 2 FFP (takes 35+min), use if transfusing >2u PRBCs Determine availability of additional RBCs and other Coag products
Stage 3	Total blood loss over 1500ml, or >2 units PRBCs given or VS unstable or suspicion of DIC		
<i>Stage 3 is focused on the Massive Transfusion protocol and invasive surgical approaches for control of bleeding.</i>	<ul style="list-style-type: none"> Mobilize team <ul style="list-style-type: none"> -Advanced GYN surgeon -2nd Anesthesia Provider -OR staff -Adult Intensivist Repeat labs including coags and ABG's Central line Social Worker/ family support 	<ul style="list-style-type: none"> Activate Massive Hemorrhage Protocol Laparotomy: <ul style="list-style-type: none"> -B-Lynch Suture -Uterine Artery Ligation Hysterectomy Patient support <ul style="list-style-type: none"> -Fluid warmer -Upper body warming device -Sequential compression stockings 	<ul style="list-style-type: none"> Transfuse Aggressively Massive Hemorrhage Pack <ul style="list-style-type: none"> Near 1:1 PRBC:FFP 1 PLT pheresis pack per 6units PRBCs Unresponsive Coagulopathy: <ul style="list-style-type: none"> After 10 units PRBCs and full coagulation factor replacement: may consider rFactor VIIa

California Western Quality Care Collaborative (CWQCC) Hemorrhage Initiative (2009) v1.0: www.cwqcc.org for details. Programs funded by grants from the California Department of Public Health, Center for Family Health, Maternal, Child and Adolescent Health. © 2009.



California Maternal Quality Care Collaborative (CMQCC), Hemorrhage Taskforce (2009) visit: www.CMQCC.org for details
Programs funded by grants from the California Department of Public Health, Center for Family Health, Maternal, Child and Adolescent Health Division

The 3 "R's" for addressing Post-Partum Hemorrhage include:

Readiness:

- Hemorrhage Cart / with procedural Instructions (balloons, sutures)
- Partnership with the Blood Bank
- Regular unit-based drills (with debriefings)
- Rapid availability of necessary medications
- Access to resources needed for special cases
- Unit/Staff education re protocols

Recognition:

- Assessment of hemorrhage risk on admission and late in labor
- Early Warning tool that identifies symptoms and vital signs as triggers
- Quantitative assessment of CUMULATIVE blood loss

Response:

- A standard OB Hemorrhage Protocol with checklists

Finally, a critical component:

Prevention / Learning:

- Universal use of 'Active Management' of the 3rd Stage of labor
- Establishment of a culture that embraces the post-event debriefing/huddle
- Reviews of all serious cases for systems issues (via the mini RCA format)

(Lyndon A L. D., July 2010)

Primary Driver

Standardize readiness for obstetric emergencies

Secondary Driver

Implement delivery systems for standardized care

Ideas to test:

- Have emergency supplies and medications readily available through the use of standardized hemorrhage carts or kits.
- Keep a hemorrhage kit at the medication delivery station.
- With the assistance of physicians, nurses, and blood bank staff, develop a hospital protocol for the response to hemorrhage using an evidence-based example such as the Maternal Hemorrhage Toolkit found on www.CMQCC.org.
- Use policies, protocol examples, practice bundles, educational materials, and data collection tools that have already been created and are publicly available from organizations like CMQCC and IHI.

Primary Driver

Standardize the recognition of obstetric emergencies

Secondary Driver

Implement standardized early warning systems to identify high risk patients

Ideas to test:

- Instead of estimating blood loss, utilize equipment that can identify and quantify blood loss, such as drapes with a calibrated collection system.
- Implement a tool that uses evidence-based triggers for the diagnosis and treatment of hemorrhage in obstetric patients.
- Use standardized language to describe the amount of blood loss and fetal heart tracings in communications among the treatment team and with the blood bank.

Primary Driver

Standardize responses to obstetric emergencies

Secondary Driver

Implement standardized protocols for obstetric emergencies

Ideas to test:

- Conduct drills regularly with physicians and nurses to simulate obstetric emergencies such as maternal hemorrhage
- Place copies of the hemorrhage protocol in prominent places in each patient room.
- Conduct drills regularly with physicians and nurses to simulate obstetric emergencies.

- Conduct a thorough debriefing after each actual and simulated emergency to identify areas needing improvement and obtain suggestions for improving future exercises.
- Allow all team members the opportunity to speak and offer suggestions at each debriefing.

SEVERE PRE-ECLAMPSIA

The biggest opportunity to prevent maternal deaths from pre-eclampsia is through the prevention of strokes. Unfortunately, there has been little progress in preventing maternal death in the United States from hemorrhagic cerebral vascular accidents. Controlling blood pressure is the best way to prevent deaths due to stroke in women with pre-eclampsia. In order to prevent stroke, it is imperative to recognize and appropriately treat systolic and diastolic hypertension in a timely manner.

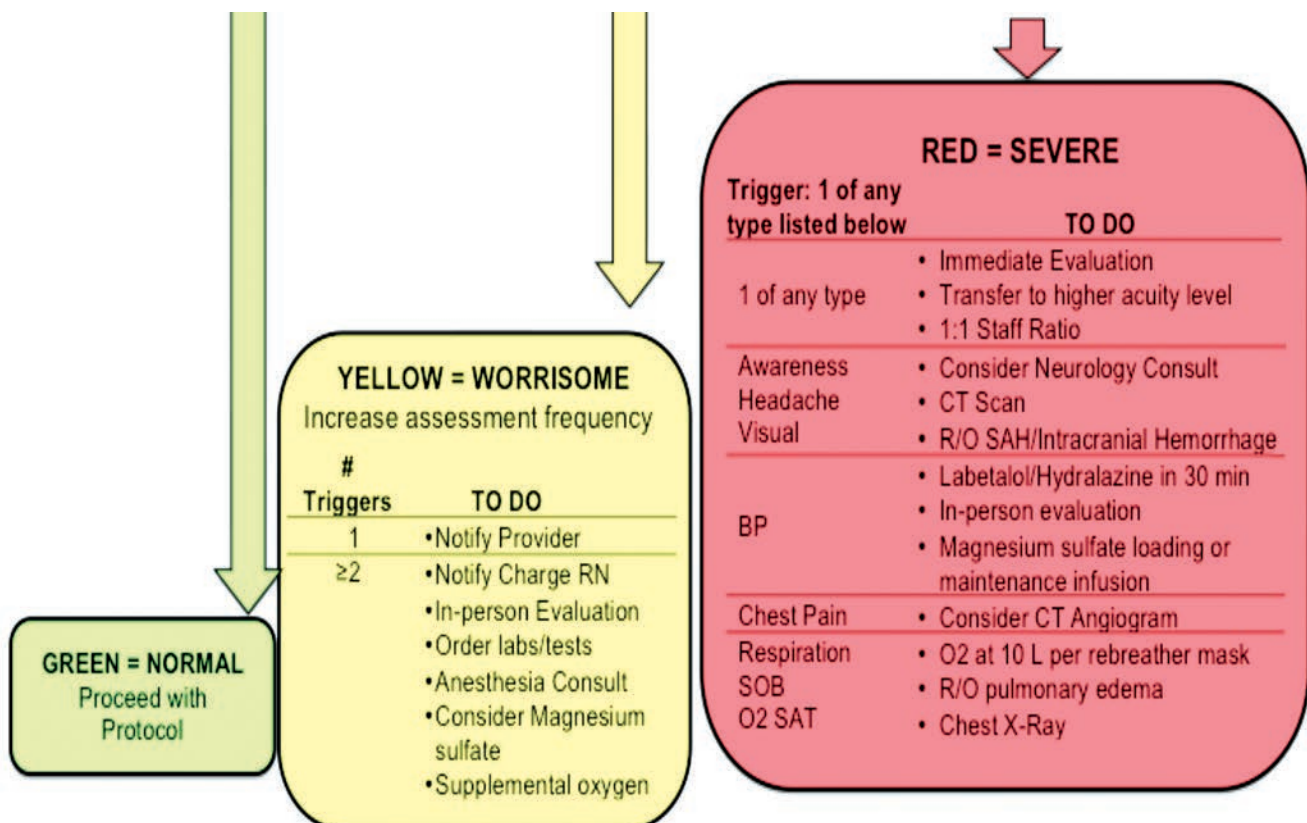
Early recognition and treatment of worsening signs and symptoms of pre-eclampsia are critical factors in reducing maternal morbidity and mortality, as demonstrated by the 2002-2004 data from the California Pregnancy-Associated Maternal Mortality Review. Missed triggers (i.e. abnormal vital signs) occurred in 60% of pre-eclampsia deaths.

The critical initial intervention to decrease maternal morbidity and mortality is to administer antihypertensive medications within 15-30 minutes of documentation of persistent BP ≥ 160 systolic, and/or >105 diastolic. (Blood pressure should be re-tested in 10-15 minutes.) In Martin et al., strokes occurred in 95.8% of women with systolic BP greater than or equal to 160 mm Hg, and in 12.5% of women with diastolic BP greater than 110 mm Hg. (Martin JN, 2005)

An organized tool to identify “clinical signs” or triggers of concern can help clinicians recognize and respond to emergencies in a timelier manner and avoid delays in diagnosis and treatment. The California Maternal Quality Care Collaborative has developed the Severe Pre-Eclampsia Toolkit that contains an Early Recognition Tool. (www.CMQCC.org)

The Early Recognition Tool can be incorporated into the maternal chart notes and can be used, beginning in the prenatal clinic and continuing until discharge, as a guide for vital sign monitoring and documentation. The tool will accompany the patient and provide clinicians with a visual display of vital sign trends, allowing earlier recognition of deviations from the mother’s “typical” physiology.

ASSESS	NORMAL (GREEN)	WORRISOME (YELLOW)	SEVERE (RED)
Awareness	Alert/Oriented	•Agitated/Confused •Drowsy •Difficulty speaking	•Unresponsive
Headache	None	•Mild headache •Nausea, Vomiting	•Unrelieved Headache
Vision	None	•Blurred or impaired	•Temporary blindness
Systolic BP (mmHG)	100-139	140-159	≥160
Diastolic BP (mmHG)	50-89	90-105	≥105
HR	61-110	111-129	≥130
Respiration	11-24	25-30	<10 or >30
SOB	Absent	Present	Present
O2 Sat (%)	≥95	91-94	≤90
Pain: Abdomen or Chest	None	•Nausea, Vomiting •Chest Pain •Abdominal Pain	•Nausea, Vomiting •Chest Pain •Abdominal Pain
Fetal Signs	•Category I •Reactive NST	•Category II •IUGR •Non-Reactive NST	•Category III
Urine Output (ml/hr)	≥50	30-49	≤30 (in 2 hrs)
Proteinuria	Trace	•++/++ •≥0.3 gr/24 hrs	•>+3 •≥5g/24hrs*
Platelets	>100	50-100	<50
AST/ALT	<70	>70	>70
Creatinine	<0.8	0.9-1.2	>1.2
Magnesium Sulfate Toxicity	•DTR +1 •Respiration 16-20	•Depression of patellar reflexes	•Respiration <12



The 3 “R’s” for Severe Pre-Eclampsia are:

Readiness:

- Have antihypertensive medications readily available to be administered within 15-30 minutes for a persistent blood pressure of greater than or equal to 160 systolic and/or greater than 105 diastolic. (Re-check the BP 15 minutes later – if it continues to be elevated, administer the antihypertensive medications as per physician orders.)
- Use an early warning-trigger tool to identify those patients at highest risk for morbidity related to severe hypertension.

Recognition:

- Patients presenting with symptoms of headache, abdominal pain, shortness of breath, generalized swelling, or complaints of “I just don’t feel right” should be evaluated for atypical presentations of pre-eclampsia or for “severe features”.
- Standardize the definition of severe pre-eclampsia.
- Use of education to increase patient awareness of signs and symptoms of pre-eclampsia and eclampsia.

Response:

- Algorithms for the acute treatment of severe hypertension and eclampsia should be developed and readily available.
- Early post-discharge follow-up is recommended for **all patients** diagnosed with pre-eclampsia/eclampsia. The Pre-eclampsia Toolkit recommends follow-up
 - within 3-7 days, if medication was used during labor and delivery OR postpartum
 - within 7-14 days, if no medication was used
- **Post-partum** patients presenting to the ED with hypertension, pre-eclampsia, or eclampsia should either be assessed by **or admitted to an obstetric service**
- Implementing pre-eclampsia-specific checklists, team training and communication strategies, and continuous process improvement strategies will likely reduce hypertensive-related morbidity.
- Use of patient education strategies, targeted to the educational level of the patients, is essential for increasing patient awareness of signs and symptoms of pre-eclampsia.

Primary Driver

Standardize readiness for obstetric emergencies

Secondary Driver

Implement standardized care delivery systems

Ideas to test:

- Have emergency supplies and medications readily available through the use of standardized carts or kits.
- Keep a severe hypertension or eclampsia kit at the medication delivery station.
- With the assistance of physicians, nurses, and blood bank staff, develop a protocol for the response to severe hypertension using an evidence-based example such as the Severe Pre-Eclampsia Toolkit from www.CMQCC.org.
- Use policies, protocol examples, practice bundles, educational materials, and data collection tools that have already been created and are publicly available from organizations such as CMQCC and IHI.

Primary Driver

Standardize Recognition of obstetric emergencies

Secondary Driver

Implement standardized early warning systems to identify high risk patients

Ideas to test:

- Implement a tool using evidence-based triggers for the diagnosis and treatment of hemorrhage and severe pre-eclampsia in obstetric patients.
- Using a standardized assessment tool, evaluate every obstetric patient for the risk of severe morbidity using a standardized assessment tool.
- Use standardized language to describe the amount of blood loss, the severity of pre-eclampsia, and fetal heart tracings in communications among the treatment team and with the blood bank.

Primary Driver

Standardize responses to obstetric emergencies

Secondary Driver

Implement standardized protocols for obstetric emergencies

Ideas to test:

- Place copies of the severe hypertension protocol in prominent places in each patient room.
- Schedule simulation drills regularly with physicians and nurses to practice the response to obstetric emergencies such as eclampsia, and use feedback from a debriefing after each exercise to improve future responses.

- Conduct a thorough debriefing after each actual and simulated emergency to identify areas needing improvement, and obtain suggestions for future exercises.
- Allow all team members the opportunity to speak and offer suggestions at each debriefing.

OBSTETRIC VTE

DVT is more common in the ante-partum period versus the postpartum period (74% vs. 26%, $P < .001$; mean gestational age at diagnosis of 16.8 ± 2.4 weeks). But, as the puerperal period is only 6 weeks, it is associated with the greatest “risk per time interval”. Among patients with ante-partum DVT, 50% are detected by 15 weeks gestation, 38% between 16 & 30 weeks, and only 17% after 30 weeks. In contrast, most pulmonary emboli are diagnosed in the post-partum period (60%), and are strongly associated with cesarean delivery [Relative Risk (RR) of 30, $p < 0.001$]. Thus, the risk of VTE is increased 6-fold during pregnancy, making it one of the top causes of obstetric harm. It has also been noted that pregnant women admitted to the hospital during the ante-partum period are at greatest risk for VTE. (Sultan AA, 2013)

The 3 “R’s” for Obstetric VTE are:

Readiness:

- Sequential Compression Devices (SCD) prior to delivery for all C-section deliveries
- Availability of prophylactic medication at the time of assessment

Recognition:

- Standardize assessments for all patients to determine risk for VTE

Response:

- Standard protocol for chemoprophylaxis.
 - Continue prophylaxis medications for all women who have been receiving it or have been on full anticoagulation during the ante-partum period.
 - Add chemoprophylaxis for patients with:
 - History of VTE not already on chemoprophylaxis
 - Family History of VTE plus any thrombophilia
 - Morbid obesity (BMI > 40)

Or

- With a score of 2 or more and with additional risks.

Primary Driver

Standardize readiness for obstetric emergencies

Secondary Driver

Implement standardized care delivery systems

Ideas to test:

- Develop and use policies, protocol examples, practice bundles, educational materials, and data collection tools that have already been created and are publicly available.
- Unless contraindicated, place sequential compression devices on all cesarean delivery patients.

Primary Driver

Standardize recognition of obstetric emergencies

Secondary Driver

Implement standardized early warning systems to identify high-risk patients

Ideas to test:

- Evaluate every obstetric patient for risk of VTE using a standardized assessment tool.
- Use standardized language to describe VTE risks when communicating among the treatment team and with the blood bank.

Primary Driver

Standardize responses to obstetric emergencies

Secondary Driver

Implement standardized protocols for obstetric emergencies

Ideas to test:

- Schedule regular simulation drills with physicians and nurses to practice the response to obstetric emergencies such as hemorrhage, and use the feedback from the debriefing after the event to improve future responses.
- Conduct a thorough debriefing after each actual and simulated emergency to identify areas needing improvement and to obtain suggestions for future exercises.
- Allow all team members the opportunity to speak and offer suggestions at teach debriefing

Appendix 1: OB Harm Top Ten Checklist

OB Harm Top Ten Checklist

TOP TEN, EVIDENCE BASED INTERVENTIONS				
PROCESS CHANGE	IN PLACE	NOT DONE	WILL ADOPT	NOTES (RESPONSIBLE AND BY WHEN?)
Put together a hemorrhage cart with sutures, balloons, medications and a copy of the hospital's hemorrhage protocol to be kept in a secure, easily accessible area for nursing staff.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Develop a hospital protocol for the response to hemorrhage using an evidence based example, such as the Maternal Hemorrhage Toolkit found on www.CMQCC.org with the involvement of blood bank, nursing and physicians.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Schedule simulation drills to practice the response to obstetrical emergencies such as hemorrhage on a regular basis, and use the feedback in the debrief after the event to improve future responses.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Place copies of the hospital's hemorrhage protocol in prominent places in each patient room.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Document cumulative blood loss during delivery instead of estimated blood loss by using graduated drapes, weighing sponges, or by visual count.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Use policies, protocol examples, educational materials and data collection tools that are already created and available publicly from CMQCC.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Evaluate every obstetrical patient for risk of VTE using a standardized assessment tool.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Unless contraindicated, place sequential compression devices on all cesarean delivery patients.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Use a standardized language to describe amount of blood loss, severity of pre-eclampsia, and fetal heart tracings in communication among the treatment team, including blood bank.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Review all obstetrical HTN cases with severe morbidity for systems issues in a root cause analysis (RCA) format.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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