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Recognition of and Response to Obstetric Emergencies: Developing A Virtual Competency-Based Orientation Program

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**Recognition of and Response to Obstetric Emergencies:
Developing A Virtual Competency-Based Orientation Program**

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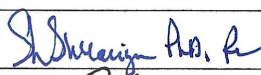
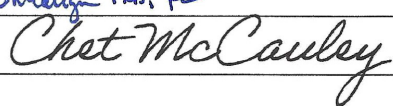
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Title of DNP Project: <h2 style="text-align: center;">Recognition of and Response to Ob</h2> <p style="text-align: center; font-size: small;"><i>My signature confirms I have reviewed and approved this final written DNP Scholarly Project. DocuSign electronic signature or wet signature required.</i></p>		
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DNP Project Primary Faculty: Sandra Swearingen, PhD, RN		8/04/2023 8/06/202
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ABSTRACT

In order to improve outcomes in the perinatal setting, the development of a Virtual Competency-Based Orientation Program (CBO) toolkit is vital. Two toolkits, namely the Alliance for Innovation on Maternal Health (AIM) and the California Maternal Quality Care Collaborative (CMQCC), have been identified as effective in enhancing perinatal outcomes. AIM is a national initiative focused on improving maternal health outcomes, promoting safer birth practices, and saving lives through the implementation of best practices. CMQCC is a multi-stakeholder organization in California committed to eliminating preventable morbidity, mortality, and racial disparities in maternity care. Both AIM and CMQCC CBO toolkits incorporate research, quality improvement strategies, bundled care approaches, and collaborative outreach. The utilization of a bundled set of care strategies has been associated with positive outcomes in the maternal newborn setting. These open resource toolkits are designed to facilitate change readiness by engaging stakeholders in understanding the reasons for the proposed changes, gaining leadership support, assembling interprofessional implementation teams, and providing evidence-based information that demonstrates the need for orientation programs while identifying the necessary resources. The CBO outlined in this project serves as a guide for organizations of various backgrounds to effectively prepare, implement, and utilize for the promotion of best practices. The project follows the framework provided by the Centers for Disease Control and Prevention (CDC). Key considerations, including staff training, workflow adjustments, and ongoing evaluation, are crucial to warrant successful implementation and sustainable improvements in practices especially involving maternal hemorrhage and sepsis. Among existing toolkits, the CMQCC and AIM safety bundles have been noted to be exemplary in improving outcomes in the perinatal setting.

Recognition of and Response to Obstetric Emergencies:

Developing A Virtual Competency-Based Orientation Program

Maternal mortality has been declining globally except in the United States (DeClercq & Zephyrin, 2020). Obstetrical emergencies can occur antenatally, intrapartum, or post-delivery. These emergencies can threaten the lives of either the mother or the baby, causing morbidity and mortality. Emergencies cannot always be predicted and can happen at any time. The need for swift and decisive action is necessary for good perinatal outcomes. The obstetric team must be ready to meet these crises with the skills and knowledge required to avert problems and mitigate harm, to combat the alarming trend in increased mortality statistics in the US.

A competency-based toolkit for obstetrical emergencies provides a structured framework or standardized approach to managing these crises and alleviating adverse outcomes. This evidence-based project aimed to compare a competency-based orientation protocol based on recommendations from AIM and CMQCC for obstetrical emergencies for hemorrhage and sepsis, which are critical to mother-baby safety. The Joint Commission (TJC) has set accreditation standards pertaining to maternal safety that can be met by a CBO toolkit to improve perinatal outcomes and meet current guidelines (The Joint Commission, 2019). This toolkit for competency-based orientation can be tailored to a facility's needs, and the resources available are comprehensive.

Significance of the Practice Problem

Crises are not planned events and can occur at any time. Maternal mortality and severe maternal morbidity, especially among women of color, have risen in the United States (Lu & Noursi, 2021). This rise has been associated with advanced maternal age, race, obesity, and chronic health conditions such as diabetes and hypertension during pregnancy, contributing to the higher maternal morbidity and mortality seen today (CDC, 2017; Chinn et al., 2020; Doheny, 2022; Lu &

Noursi, 2021). The U.S. maternal mortality rate was 24 deaths per 100,000 live births, three times the rate of other high-income countries (Hoyert, 2023). Obstetric emergencies can happen with differing levels of expertise and staffing available, resulting in intense pressure on the OB team to perform well because the safety of the maternal dyad is at risk, which can contribute to the high rate of maternal mortality and morbidity (Doheny, 2022; Fransen et al., 2017). Adverse outcomes can occur quickly if problems are not recognized immediately (ACOG 2017, ACOG 2023; AWHONN 2021). Maternal mortality has increased in the United States from 2019 to 2020, to 23.8 deaths per 100,000 live births from 20.1 in 2019 (Hoyert, 2023). The actual number rose from 754 women in 2019 to 861 women in 2020; the most significant rate increase was seen in non-Hispanic black women and women over 40 years old (Correa-de-Araujo & Yoon, 2021; Hoyert, 2023). The United States has a higher maternal mortality rate than other developed countries, especially in vulnerable populations (Correa-de-Araujo & Yoon, 2021; Doheny, 2022). According to the Centers for Disease Control and Prevention (CDC), maternal sepsis and hemorrhage are two top causes of preventable pregnancy-related deaths (CDC 2023).

The infrequent occurrence of OB emergencies often results in those not recognizing and responding to the demands of the situation (Fransen et al., 2017; Schornack et al., 2017). Teamwork is a vital part of caring for OB emergencies, with a large percentage of preventable errors related to team failures associated with risk assessment, poor communication, knowledge, or skills (Mercer, 2019; Schornack et al., 2017). ACOG and TJC, nationally recognized organizations, determined that ineffectual teamwork and communication contributed to the majority of adverse OB outcomes (ACOG 2014, TJC 2019). When an emergency occurs, the obstetric team needs to respond quickly with the knowledge, skills, and confidence to ensure a good outcome for mother and baby; being ready and prepared is essential (Ameh et al., 2019; Chinn et al., 2020).

There is a call from The Joint Commission (2020), to provide a structure for standardizing

maternity facilities' capabilities and personnel to address this problem. Due to concern over increased maternal deaths per 100,000 live births the Preventing Maternal Deaths Act of 2018 was passed to combat the alarming trend. Key processes have been identified that have reduced obstetric adverse events, including education and training, adherence to evidence-based guidelines, regular safety rounds, and briefings as best practices (Hüner et al., 2023; Kelly, 2015). In California, the maternal mortality ratio declined compared to the national mortality rate to a stunning 5.9% in 2016, according to the California Maternal Quality Care Collaborative, much lower than the national average (CMQCC, 2021). This success has been accomplished through the four pillars of education, current data usage, quality improvement projects, and partnerships with hospitals (CMQCC, 2021). In addition, Ameh et al. (2019), in a systematic review, concluded that improved clinical practice and neonatal outcomes were realized when training in competency-based orientation was utilized.

There is a need for standardized competency-based orientation in obstetrical emergencies to include a multi-factorial approach to prepare staff for crises on the unit, to meet federal guidelines. The Joint Commission developed a new standard in perinatal core measures to address severe obstetrical complications due to the current problems in maternal mortality and morbidity, which specify staff and provider education and drills (Beatson, 2022; TJC 2019). The Joint Commission, and American College of Obstetrics and Gynecology, and the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) have recommended multi-disciplinary team drills for over a decade (Tyer-Viola, 2017). CMQCC and AIM recommend simulation training to augment didactic teaching in OB emergencies and an extensive toolkit to support this end (Casper & Arafeh, 2015).

Purpose of the Program Review and Development Project

This CBO aimed to provide tools to implement a standardized toolkit for an inpatient

obstetric unit to orient nurses to obstetric emergencies and at yearly intervals. With many new nurses being trained every year, a CBO must be in place so that nurses have a structured orientation that will give them the skills, knowledge, and judgment to handle these infrequent but challenging high-acuity events. Ongoing competencies and skills are a requirement of TJC, at orientation and yearly. How they are implemented can have wide variations (Weiner, 2022). Therefore, there is a need for a program to be in place that is revised regularly by experts in the field based on best evidence and practice that prepares nurses for the rigors in this specialty area (Mercer, 2019). The objectives of this program were to 1) apply the ACOG and CMQCC framework to obstetric emergencies and 2) develop a toolkit to increase reactions to obstetric emergencies to be used in hospital settings which can be completed during the hospital orientation period of 4-12 weeks (ACOG, 2016, Beatson, 2022).

The objectives of this toolkit for OB emergencies are outlined using the SMART goal format (Specific, Measurable, Attainable, Relevant, and Timed). Specific: 1) Orient nurses to a tool kit to prepare them to perform in an obstetrical emergency. Provide an evidence-based guideline for replication for use at hospitals for OB emergencies. 2) Measurable: Implement measurable parameters in the toolkit to assess competency. Identify facilities and stakeholders that would benefit from a CBO. 3) Attainable: Use of AIM and CMQCC resources to drive the project. Implementation at the unit level for direct care application. 4) Relevant: Use of up-to-date EBP to maintain reliability and validity. Interventions can be tailored to a variety of hospital settings for immediate use. 5) Timed: Implementation should occur over 4–12-week weeks, depending on the facility and the nurse's prior experience. Long-term goals would be to measure nurses' ability to feel competent and confident in managing acute emergencies and functioning in a team environment. The global objective is to provide a CBO model for facilities to implement for OB emergencies.

Program Problem Statement

For registered nurses in an antepartum and labor and delivery unit (P), how does established competency-based orientation for nursing care for the parturient patient (I) compared to a virtual, on-demand competency-based orientation program for nursing care for the parturient patient (C) influence the efficacy of nurse recognition and response prioritization for obstetric emergencies (O) within 8 weeks?

A Competency-Based Orientation for Nursing Staff to manage obstetric emergencies was developed to enhance understanding of OB crises as these high acuity events put maternal and newborn lives at risk. Many hospitals need standardized EBP toolkits. ACOG and CMQCC have programs developed for managing obstetrical crises that meet TJC requirements for accreditation; both are accessible virtually for hospital use under open licenses. Since OB emergencies can occur at any time, units need to have all tools available for handling these problems using current evidenced based practice. Established programs may need to have all the requirements organized and set to go, compared to a virtual, on-demand, competency-based orientation program.

Adults have different learning styles, and this toolkit addresses the need to be able to access training at any time in a standardized manner (CMQCC, 2022; ACOG, 2022). The outcome measure is an improvement in the nurse's self-efficacy and recognition of obstetrical emergencies after implementation of the toolkit, compared to an established CBO (Kelly, 2015; Kidder & Chapel, 2018). If staff managing the event are unprepared, lack efficacy, or do not recognize emergencies, errors may occur due to a lack of training and teamwork. A frequently cited cause of medical errors during emergencies is related to unclear communication and poor preparation (Fitz et al., 2020; TJC, 2021). The outcome would be measured during a 4-12 week timeframe by identifying the number of nurses who have demonstrated competency by completing the training on OB hemorrhage and sepsis. Hospitals can use various *practices* in the toolkit to confer competencies, such as competency checklists, simulations, and readings. Competency-based programs have

proven highly effective in increasing competency and performance in the hospital setting (Ameh et al., 2019). The recognition and implementation of emergency measures significantly reduce the risk of maternal and newborn mortality and morbidity, improving outcomes (Atallah & Goffman, 2020). Therefore, a competency-based orientation program was necessary to optimize the prevention and management of emergencies to improve care with effective training programs (Weiner, 2022). This CBO allows hospitals to access, compare and utilize two different toolkits to standardize training and reactions to obstetrical emergencies using the best available practices. The objective of improving patient outcomes serves as the end goal.

Utility of Program Review

Emergency medical situations are precise that, an emergency. The OB team needs to anticipate and respond quickly and effectively to mitigate poor outcomes. A CBO toolkit is essential to lay the foundations so that when an urgent situation arises, the team can communicate and act strategically to facilitate positive outcomes. The combination of drills, emergency training, checklists, and protocols has been shown to increase the responsiveness of nurses and the OB team to recognize and effectively deal with these crises (Casper & Arafeh, 2015; CMQCC, 2022). Strategies that include prompt recognition and rapid intervention can prevent neonatal and maternal morbidity and mortality (Harvey, 2018; Lagrew et al., 2022). CMQCC (2022) and AIM (2022) utilize a standardized approach of readiness, recognition/prevention, response, reporting, and systems learning, constituting a framework for improving outcomes.

Integrating an effective CBO for OB emergencies decreases morbidity and mortality in many facilities (CMQCC, 2022). Evidence-based practice is needed to improve training and practice to produce better obstetric teams to handle these high-acuity events effectively. The Joint Commission and professional organizations mandate that hospitals have a plan in place, and a CBO would fill this need. Using a toolkit, the hospital can have a way to evaluate, assess and improve its

performance on an annual basis for OB staff. Preparations for OB emergencies should be similar, whatever the hospital setting, so all women are treated with up-to-date standards. Inadequate staff training and improper handling of OB emergencies in developed countries are associated with poor maternal/neonatal outcomes (Chinn et al., 2023, Fransen et al., 2015). In addition, stakeholders in the hospital will need to meet the revised TJC's Maternal Levels of Care Verification which requires "an assessment of an organization's resources, people and equipment" (Kilpatrick et al., 2019). All populations of delivering women would be able to benefit from a standardized method of care during an emergency event. California is a role model of learning through the use of collaborative toolkits using standardized dashboards for proving better outcomes (CMQCC,2022).

Analytical Framework

The Centers for Disease Control and Prevention (CDC) Program Performance and Evaluation Office (PPEO) has developed a helpful framework publicly available to guide the implementation of this project. The Centers for Disease Control's (CDC) program evaluation framework has an organized and structured system for ensuring that best practices are followed systematically. It is specially tailored to the engagement of stakeholders and program evaluation. The framework includes six key steps and four standards and has been utilized for over 20 years (Kidder & Chapel, 2018). The framework is shown as a circular wheel with the four standards in the center and the six pathways or steps surrounding these four standards. The steps to follow are to 1) engage stakeholders, 2) include a thorough description of the program, 3) focus on evaluation and design, 4) credible evidence gathering, 5) justification of conclusions that are reached, and 6) dissemination of findings or sharing of lessons (Kidder & Chapel, 2018). The four standards for effective evaluations involve utility to meet users' needs, that it is feasible, has propriety ethics or holds regard for the welfare of others, and is accurate in its information (CDC, 2017; Kidder & Chapel,

2018).

An additional framework that is synergistic with the CDC program evaluation framework (PPEO) is the Johns Hopkins Evidence-Based Practice (JHNEBP) framework. Both offer a model for healthcare professionals to follow to ensure a comprehensive program is in place. They both ensure that a good foundation is in place for program development, teamwork, and furtherance of nursing expertise to meet the populations in need. The JHNEBP has three steps: the question, the evidence used, and translation into practice (Dang et al., 2022). Both of these frameworks emphasize a systematic process where all stakeholders and team members are incorporated into the development of the project through recognition of the population studied, a planning phase with the description of the necessary intervention, including evaluation of the evidence used, and dissemination of findings (CDC, 2017; Dang et al. 2022). Both contribute to this project as multiple stakeholders are involved, which requires strong communication and apt dissemination to ensure that nurses receive the best EBP training in the hospital setting for good patient outcomes.

Evidence Search Strategy, Results, and Evaluation

There is a strong need to use EBP in the OB emergency setting, as lives are at stake. The guiding framework for this project will be the Program Performance and Evaluation Office (PPEO). This model, in the first two steps, calls for identifying stakeholders and describing the program. Support from stakeholders, such as administration, nurses, providers, information services, regulatory teams, and managers, is essential to understand the importance of a sound CBO training program for OB emergencies. The third step involves evaluating the program's design; hence, the CBO toolkit can be implemented to determine how the nurses gain competency in OB emergencies. This competency was evidence-based to facilitate the best practices known (CDC, 2017). Finally, the competencies were apprised to maintain buy-in and ensure the best design is

available. Lastly, the intervention was measured by how many hospitals or nurses utilize the CBO program. All this is predicated on a thorough literature search laying a solid foundation for practice. This led to the last two steps in the PPEO framework of translating evidence into practice and sharing the findings (CDC, 2017).

Search Strategy

A literature review was conducted using OVID, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and Joanna Briggs. The search was inclusive and included all articles. An initial search using the search terms Obstetric, emergencies, emergency, competency, simulation, sepsis, and training with over 350 articles was generated. Boolean search words were used to include not residents, not students. The resultant search yielded a total of 59 articles obtained from 2015-2022. The studies excluded were those relating to students and residents, those not OB emergency-related, or were not hospital-based, or that did not have a research component. The abstracts/titles were reviewed, duplicates removed, and abstracts screened for relevancy. A total of 12 articles were included in the final review that pertained to CBO, nurses, and training in Obstetric emergencies. The articles reviewed include simulation, didactics, and competency-based orientations. Study designs were also taken into account with an eye toward high-quality studies. The Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) Research Evidence Appraisal Tool and the JHNEBP Non-Research Evidence Appraisal Tool supplied the framework for the appraisal of the remaining 13 studies (Dang & Dearholt, 2018).

Results

The reviewed articles included seven systemic reviews, six original research articles, one non-research article, and a practice bulletin from a professional organization. The twelve studies reviewed were all quantitative. The research studies consist of three randomized studies, one retrospective, one quasi-experimental, and one nonrandomized study. The Articles that were not

kept involved emergencies related to office settings pertained to residents or students, were qualitative, were mixed methods, or were case studies. One of the primary reasons for excluding a study was that it did not relate to the research question for this project or did not have a statistical analysis component. The systemic review revealed a total of seven studies pertinent to this project. Four systemic reviews were authored in 2021, one in 2020, one in 2019, and one in 2016, allowing for the most current review of studies available at the time of the project.

The level of the evidence, based on the JHNEBP Evidence Appraisal Tools, consists of, Level I includes experimental studies-randomized control trials (RCT), explanatory mixed-methods studies that include only a level I quantitative study, and systematic reviews of RCT. Level II contains quasi-experimental studies, explanatory mixed-method studies with level II quantitative studies, and systematic reviews that involve quasi-experimental studies. Level III evidence covers non-experimental studies, systematic reviews of other Level III studies, exploratory, convergent, or multiphasic mixed-methods studies, explanatory mixed-methods studies with a Level III quantitative component, and qualitative studies. Level IV evidence comprises opinions and consensus statements from respected authorities and expert committees. Level V evidence is non-research evidence containing literature, integrative reviews, and quality improvement data. Using the JHNEBP tools, the quality of evidence was rated with “A” being high quality, “B,” good quality, and “C” low quality (Dang et al., 2022)

Evaluation

The literature review of evidence-based practices on the JHNEBP tools demonstrated four level 1 reviews or studies, five level-two studies, three level-two studies, one review, and two research articles. The evidence grading was also guided by the JHNEBP tools (Dang et al., 2022). A Prisma diagram is was created, see Figure one. The quality of articles chosen was primarily high grade with a total of 9 articles with high-grade quality or level ‘A,’ one with

medium grade quality grade 'B' evidence, and two with grade 'C.' Tables A and B reflect the literature reviews (Dang et al., 2022). Appendix A and B summarize the studies and articles for the project. Appendix B has the summaries of Systemic reviews. The article that is a level 4 will not be included in the synthesis of evidence as it is a clinical practice guideline though of high quality but is meant to serve as a guide for practice.

Table A

	Research Study	Review
Level 1	1	3
Level 2	3	2
Level 3	2	1

Table B

	Research Study	Review
Grade A	4	5
Grade B	0	1
Grade C	2	0

Critical Appraisal of the Evidence with Themes

The literature reviewed revealed four themes essential to handling OB emergencies: simulation training, management of OB emergencies, team training, and types of interventions employed. The use of a standardized toolkit with evaluation and metrics has been shown to facilitate best practices. Many of the articles reviewed were conducted in a tertiary care setting in the United States and globally; however, several were done in smaller settings and community

hospitals. Resource-poor papers were reviewed as well as those delivered in resource-rich areas. Handling OB emergencies takes a multifaceted approach, team training, ongoing education, and the necessary resources and protocols to ensure good communication and outcomes during a crisis (ACOG Committee Opinion #590,2014).

Management of OB emergencies

There is a call to reduce maternal and neonatal mortality nationally and globally (TJC, 2022; WHO, 2022). After review and synthesis of the literature, the overriding theme is the need to institute emergency OB training, especially in a team context, using a competency-based approach. OB emergencies occur in less than 2% of the cases but can result in a large percentage of patient morbidity and mortality due to mismanagement of these events (Ameh et al., 2019; Lutgendorf et al., 2017). TJC has two new standards that address areas that will reduce maternal complications. These address prevention and then timely intervention, recognition, and treatment of maternal hemorrhage and hypertensive disorders (The Joint Commission, 2019). OB emergencies include hemorrhage, sepsis, shoulder dystocia, thrombotic disease, amniotic fluid embolism and hypertensive disease, which can happen in any hospital setting (Beck et al., 2021). Professional organizations such as ACOG implement training to ensure the team is ready for this high acuity, low occurrence event that all need to be handled differently (ACOG, 2022). The scholarly articles reviewed that when the training occurred made a difference, length of time of the sessions, and periods between training all served to influence outcomes. Studies showed mixed results on efficacy due to the many variables involved (Brogaard et al., 2021; van de Ven et al., 2017; Weiner et al., 2016). The predominant idea identified is consistent, updated training with an EBP approach to aid early recognition and well-timed treatment for reducing maternal complications.

Simulation training

The literature agrees that simulation training is designed to model 'real patients' in a safe environment, where the team can practice and learn together. This is done to gain knowledge and increase team communication to minimize medical errors and improve patient experience (Afulani et al., 2019.; Fransen et al. 2017; Weiner et al. 2017). This will, in turn, should result in better patient outcomes (Fransen et al., 2020). Most of the studies reviewed focused on simulation compared to no training; random controlled trials were numerous but more challenging to obtain significant power due to the low occurrence of these events. The impact of OB simulation emergency training on improving patient safety compared to no training has been shown to be effective by decreasing the number of adverse events in meta-analysis and single studies (Otchi et al., 2021; Sheen et al., 2018), but simulation is not as effective as hoped when analyzing some outcomes (Fransen et al., 2020). Nevertheless, participants rated simulation well-liked and demonstrated increased self-efficacy after training (Lutgendorf 2017, Weiner et al., 2016). Still, methods to carry out the intervention or drills vary across hospitals. TEAM steps, EmOB in resource-poor institutions, PROMPT, and standardized scenarios were the prevalent delivery methods across the literature (Ameh et al., 2019; Weiner et al., 2016). All of the single studies showed a significant increase in knowledge pre and post-intervention, but with varying amounts of retention of information at three months (Ameh et al., 2019), six months (Merriel et al., 2016), and one year (Brogaard et al., 2021; van de Ven et al., 2017). The use of OB emergency toolkits in simulation and training has been shown to decrease morbidity and mortality in CA (CMQCC 2022, n.d.).

Virtual simulation (vsim) can be utilized to enhance learning and has been shown to be an effective tool in nursing education and could be used in the hospital setting (Foronda et al., 2020). Virtual training has the advantage of instant online access that immerses the nurse in realistic settings from a computer terminal. Several education publishers have readily available vsim

experiences that provide unfolding case studies to test the nurse's knowledge by imitating OB emergencies. The scenarios offer feedback as the learner works through the case and after with pretest and posttest designs to assess understanding (Cant et al., 2022). Virtual experiences require a financial outlay for the hospital for each learner and are predominately used in prelicensure and graduate programs of study. Padiha et al, 2020, elucidated that vsim is a promising strategy to boost clinical reasoning skills and enable lifelong learning in the hospital emergency setting.

Support for Teamwork Training

The need to utilize a multi-professional approach is well supported in the literature with statistically significant results found in single studies and confirmed by meta-analysis. Participants must work together so all team members know what to do in an emergency (Afluani et al., 2019; Ameh et al., 2019; Brogaard et al., 2021). Studies generally support the idea that when a team trains together, it builds communication and shared support with a mutual goal of improving response to an OB emergency by meta-analysis reviews (Ameh et al., 2021; Beck et al., 2021; Brogaard et al., 2021). However, studies note that getting the team to practice together can be difficult due to restraints in time, location, and leadership support (Fransen et al., 2017; Lutgendorf et al., 2017; Weiner et al., 2016). Identifying weaknesses in the hospital and the team's reactions to the scenarios with didactic background drives positive quality improvement (Aktas et al., 2021). Team training needs continued research to verify its efficacy in improving patient outcomes at a statistical level (Fransen et al., 2017). A consistent, standardized EBP protocol is strongly advocated across all articles to establish good communication, team building, and skills.

A theme throughout the review reported staff feedback as being very positive (Ameh et al., 2019; Aktas et al., 2021; Weiner et al., 2016); participants reported the period spent in the training sessions as a good use of time. It has also resulted in improved communication, such as planning

care for patients related to surgery, movement to a higher level of care, and better-coordinated responses to OB emergencies (Aktas et al., 2021; van de Ven et al., 2017). Improvements noted were in the incision to decision time, response to hemorrhage, and anticipation of emergency events (Lutgendorf et al. 2017; Otchi et al. 2021; Sheen et al., 2018)

Interventions Related to Outcomes

The need to reduce maternal mortality and morbidity has been gaining increased attention as these rates have climbed nationally (Declercq & Zephyrin, 2020). Many reasons are attributed to this increase, including more complex and high-risk patients to treat, lending further support for a CBO program (Brogaard et al., 2021; Sheen et al., 2018). Accrediting bodies have called for drills and practice to assess competency in emergency events to improve neonatal and maternal outcomes (ACOG, 2017, TJC, 2022). Outcomes can be defined on numerous levels. Several methods were found in the literature. One area was the performance of the OB team as viewed in execution, technical skills, and guideline adherence which showed improved outcomes (Otchi et al., 2021). Another salient area was review of maternal and perinatal outcomes and improvements, which shows mixed support across the literature (Beck et al., 2021; Merriel et al., 2016). Fransen 2020, noted that when looking at outcomes in OB emergencies, it is difficult to bring a smaller number down statistically than a large number. Maternal/neonatal outcomes have not been shown to be significantly reduced by simulation training alone, and the effect drops with the amount of time since the last training (Brogaard et al., 2021). Two meta-analyses supported the implementation of a CBO for standardization of practice (Francens et al., 2020; Brogaard et al., 2021). Ongoing training is needed to support staff, reinforce guidelines through standardized checklists, and facilitate a timely response and recognition to crisis situations along with debriefing. California's morbidity and mortality rates are inconsistent with the national pattern of increased poor outcomes. This may be related to a statewide initiative set up by the

CMQCC that tracks rates and emphasizes EBP among member hospitals, with access to toolkits as a public-private partnership (Main et al., 2018).

Evidence-Based Recommendation Statement

The literature review showed a considerable need for a CBO training program to prepare teams for responding to OB emergencies prompted by increased maternal and neonatal morbidity and mortality (Otchi et al., 2021). Obstetrical emergencies can test the skills and capability of the staff (Ameh et al., 2019; Fransen et al., 2020). Articles reviewed showed a need to increase knowledge, skills, and reactions to obstetrical crises to mitigate poor outcomes and ensure staff confidence in their ability to care for the maternal unit using bundles and toolkits (Lutgendorf et al., 2017; Sheen et al., 2018). Based on a thorough review of the evidence, there is a gap in the practice setting in delivering emergency treatment to women in OB emergencies this project is designed to offer toolkits that provide a multi-component competency-based program for OB emergency training. This project looked at two programs and utilized the CDC framework for Program Evaluation as a guideline for review (CDC 2017 n.d.).

Healthcare professionals have a responsibility to patients to deliver safe and competent care. Preventable mistakes have been cited throughout the literature as a modifiable component of avoiding harm, using a standardized competency-based emergency orientation program is a step toward preventing errors during real clinical crises. This can also be learned through drills and simulation as well (Brogaard et al., 2021). In addition, the actions of the OB team to decrease harm by managing OB emergencies will prevent adverse events, increase patient outcomes, and impact the team's competency (Beck et al., 2021, Weiner et al., 2016).

There is ample support in the literature for using an OB toolkit to allow staff to access it and manage obstetrical emergencies through an orientation program that incorporates all the needed components. The toolkit would include all the essentials to respond promptly and

efficiently by having up-to-date knowledge, supplies, and protocols, with standardized team communication strategies in a safe learning environment. Improving patient outcomes through properly managing OB emergencies is this toolkit's goal. In addition, toolkits can save the hospital money as well as lives (Digitail, 2023). The literature showed abundant support for this project in relation to the PICOT question.

Program Analysis and Evaluation Plan

The CDC framework guides this project as this theoretical framework provides an effective tool for change (CDC, 2023) The components are discussed individually.

Engage Stakeholders:

According to the CDC (2023), it is essential to involve the stakeholders impacted by the toolkit implementation through to the evaluation process. It is crucial to comprehend the specific or relevant units within the perinatal spectrum for each facility. The goal of this step is to develop a clear and shared understanding of the program among all stakeholders, which lays the foundation for the subsequent steps in the evaluation process. The use of a toolkit allows the facility champion to delineate the essential elements to stakeholders.

Describe the program

Using the CDC framework, it is necessary to promote analysis of the existing program and include planned steps for implementation (CDC, 2023). This step provides a detailed description of the program or intervention being evaluated. Components of this allow the designated champion to define and describe the mission, targets and objectives of the change and can depict what are the programs needs and use appropriate tools to outline the process. An example of this would be a logic model found in (Table 2).

Focus the Evaluation Design

The CDC framework emphasizes a systematic and multidimensional method. This framework lends itself to a holistic approach giving healthcare professionals essential insights into the effectiveness of interventions. It can help in identifying gaps in care and the unique needs of the organization to monitor and assess how EBP interventions reflect on patient outcomes. The importance of EBP cannot be underscored enough which includes disaggregated data. By adhering to EBP, the healthcare team can feel confident that the interventions have rigor and will support improved outcomes if followed correctly (CDC, 2023). This includes the utility of the program or who needs the information, and what stakeholders will find it relevant and actionable. In the CDC framework, it is important to consider the feasibility of the CBO, meaning addressing the resources needed, skills or expertise required and time needed for the CBO. Propriety or ethics is also a CDC standard and should reflect who the key stakeholders are to ensure the interventions are done transparently in an ethical manner to minimize bias. This also, safeguards that the results reflect relevant data. Accuracy of information collected will lead to rigor and good data interpretation to provide meaningful insights and credible findings (CDC, 2023).

Gather Credible Evidence

This step involves thoroughly collecting and evaluating relevant data to assess the program's effectiveness and outcomes. The data collected should be reliable, valid, and representative of the facility's QI initiatives and target population (CDC,2023). Toolkits from both AIM and CMQCC ensure that credible evidence is collected and analyzed through supplied metrics and flowsheets, and birth records to ensure that each facility can evaluate the effectiveness and impact of their use. This supports the overall goal of improving maternal health outcomes and promoting evidence-based care. Evidence gathering can include quality improvement initiatives, data registries, collaborative learning, and backed through research. This will be discussed in the next section.

Justify Conclusions

The fifth step covers synthesis and analysis of the gathered evidence to identify the impact or change resulting from the implementation. Unique patterns can emerge based on each facility to identify opportunities for improvement. Recommendations may include whether to continue, expand, reformat, or end the program, and are based on evidence and stakeholder needs, according to the CDC model (CDC, 2023). The toolkits are abundant in resources to this end, including health disparities, patient education, and respectful care.

Ensure Use and Lessons Learned

The sixth step in the CDC framework, is to learn from the data and apply it to the practice setting. Focuses on ensuring that the evaluation findings and lessons learned from the program are disseminated and utilized to make sound decisions for future improvements and decision-making. The CDC, (2023), stresses that the findings from each facility are valuable and can demonstrate an improved outcome or maintain a good practice record. This makes for continuous learning, sharing of best practices, and comparison of findings to promote safer practices for mother and baby. Use of one bundle and toolset may also serve as a springboard for incorporating other maternal toolkits for best practice as the facility becomes familiar with requirements.

Formative assessment can be attained through regular chart audits on staff performance and impact of CBO. This strategy will provide practice feedback, reinforcement of best practices, and corrective actions as needed. Summative assessment can be evaluated with an annual competency review of the nurse participation in simulation and education in-services provided.

Program Evaluation Discussion and Recommendations

Two essential tool kits were utilized for this CBO. One from the Alliance for Innovation on Maternal Health (AIM) and the second from California Maternal Quality Care Collaborative (CMQCC)

Table 3 and Table 4 provide an overview comparison. Both the AIM and CMQCC have multiple avenues for engaging stakeholders at all levels that meet TJC requirements. Both toolkits focus on multidisciplinary approaches and collaboration at numerous levels with consistent findings. The AIM site has many links to access resources as well as quick links to a host of specific resources.

Using the CDC framework, the CBO toolkit can be utilized for orientation of nurses and continuing competency for nurses in community to tertiary practice settings. A unit champion would be utilized to maintain and monitor for updates. A program facilitator or educator would be utilized to ensure that it is used to support existing staff and new hires. A review of the toolkit could be part of the orientation phase for onboarding nurses, and an annual review is recommended to assess competency. AIM specifically targets a broader range of stakeholders through a grant from Health Resource and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS). CMQCC also targets all stakeholders but actively provides metrics with comparisons for active hospitals in CA, WA and OR. Both have links to resources for stakeholders that provide individual access to desired sections of the toolkit. Both CBOs provide introductory videos to the program, how to enroll and success tips. Both CBOs have bundles set up for sepsis and hemorrhage for stakeholders that allow for adaptability along with presentations for buy-in (Table 4).

To discuss the second step in the CDC framework- program description. Both CBOs toolkits define their broad mission as well as the individual safety bundles for OB emergencies. The common objective was using standardized management for maternal sepsis and hemorrhage to reduce maternal morbidity and mortality through data-driven protocols and feedback. The CMQCC toolkits and coalition have been enrolling hospitals since 2006, now representing 90% of CA delivery volume. They use the broad pillars of education, continuous quality improvement, use of updated data and hospital partnerships. Statewide statistics have shown a decline in maternal mortality. The AIM maternal sepsis

toolkit targets the national level with AIM partners and collaboratives with ample resources describing the CBO using the systematic use of their 5R approach of readiness, recognition and prevention, response, reporting and system learning, and respectful equitable and supportive care. Both CBOs contain analysis of the individual toolkits in context with the bundle chosen for the problem.

The third step in the CDC framework is focused on evaluation, design, and based on practical procedures and their purpose. Both toolkits use structured frameworks and design to focus on outcomes in a systematic manner with the goal of evaluating impact of the CBO. Resources needed are clearly identified with use for high and low resource organizations. They emphasize the importance of data collection, analysis, and measurement for evaluation purposes and specific steps needed to gather the data. Both toolkits discuss how to use data already collected from birth records and ICD codes. They provide guidance on defining appropriate indicators, collection of relevant data, and analyzing the results to assess the impact of interventions. Quick links in AIM include links to implementations elements and resources, data collection plan, change package and an implementation webinar. Education content is also included for reference in both the AIM and CMQCC sites. CMQCC also has links for researchers and for sharing of lessons learned.

In the fourth step these bundles are updated regularly with input from hospitals on best practices and implementation. Designs include quality improvement data with emphasis on being proactive, prepared, and assessment strategies for each emergency with patient safety bundles. CMQCC has extensive input from hospitals throughout California, Washington, and Oregon. There are multiple links and guidelines that use maternal sepsis care bundles or hemorrhage care bundles to ensure standardized EBP care. The CMQCC toolkit has an emphasis on quantitative data with an easy onboarding policy to view metrics, while the AIM toolkit includes both quantitative and qualitative

components and extensive links and guides to ensure that evaluation, design and metrics are well planned.

The fifth step is to justify conclusions. Both toolkits justify their conclusions through a combination of evidence-based practices, stakeholder engagement, data analysis, and expert agreement. By integrating these parts, the toolkits ensure that their conclusions are supported by scientific evidence, confirmed and reviewed by data analysis, aligned with stakeholder perspectives, and validated by expert feedback. This is done by standardized algorithms and bundles to align with the healthcare environment.

The final and sixth step is to ensure that lessons learned are shared. CMQCC shares throughout the state of CA and seeks the active engagement of hospitals from tertiary to community hospitals keeping the CBO updated. AIM seeks to provide lessons learned on a national level and has active partnerships with hospitals including sharing of data with an active partnership. Both provide metrics for outcomes analysis and sharing results and best practices. CMQCC provides metrics for evaluation of the individual hospital compared to statewide statistics. Table 5 provides a summary of toolkits in a CDC standards crosswalk (Table 5).

As part of the CDC framework for program evaluation, descriptive statistics are typically used to describe or summarize the data. The most frequently observed category of Engage stakeholder was Exceeds (n = 2, 100.00%). In this category, the toolkit identifies stakeholders in each tool and its relevancy for the organization with a statement of the problem. Both provide formal agreement with conflict-of-interest disclosures and provide for metaevaluation of data and who collects with rationale. The most frequently observed category of Describe the Program was Exceeds (n = 2, 100.00%). AIM and CMQCC clearly describe purpose, goals and objectives with a dashboard for metrics provided. Simulation

programs are outlined from low to high resources settings. Context analysis is appropriate to meet unique facility needs.

The most frequently observed category of Focus Evaluation Design was Exceeds (n = 2, 100.00%). AIM and CMQCC define the purpose of the toolkit bundles, with outcome metrics, including coding staff and leadership in evaluation and design. There are algorithms and flowsheets built-in with described purposes and procedures for impact evaluation. The most frequently observed category of Gather Credible Evidence was Exceeds (n = 2, 100.00%). All sources of evidence are defined with links to resources as indicated. Includes information on scope and selection. Information is backed by credible research. Criteria for each indicator have a numerator and a denominator and purpose for metrics. The indicators chosen can be used to identify gaps. Includes use of disaggregated data for racial disparity. Information scope and selection are defined for validity and reliability in a systematic manner. Provides for micro and metaevaluation. The most frequently observed category of Justify Conclusions was Exceeds (n = 2, 100.00%). The indicators chosen demonstrated alignment with Federal and accreditation purposes. Metrics used can show adherence to best practices. Tools utilized can identify areas of need through data tracking and analysis of quantitative and qualitative information. Identifies opportunities for growth and unit development. Supports change in hospital culture and practices. Updated with lessons learned from organizations. There are system-based learning components with impartial reporting. The most frequently observed categories of Ensure Use and Lessons Learned were Exceeds and Meets, each with an observed frequency of 1 (50.00%). Identifies opportunities for growth and unit development. Both support change in hospital culture and practices and system-based learning components with impartial reporting. Updated with lessons learned from participating organizations and on the shared website in CMQCC, with large EBP data volume to back its interventions. AIM meets the criteria with partners in a collaborative-only setting. However, AIM does not represent a large percentage of hospital volume across the country, and to become part of the program members

hospitals need to form and organize a collaborative to gain access to information and current data.

Individual hospitals are not able to join at present. Frequencies and percentages are presented in Table 6.

Dissemination Plan

The dissemination plan for this CBO toolkit is available through the SOAR website at the University of St. Augustine for Health Sciences, an open-access repository for student capstone projects. In addition, it was presented during the exhibition of projects at the end of the program. The project was sent to community hospital labor and delivery directors in Southern California for review and possible implementation via email in the acute care setting. For interested hospitals, the plan is to present a demonstration using a PowerPoint presentation and virtual or in-person question-and-answer period. PowerPoint can embed videos and show graphics for enhanced understanding. Presentations that are colorful and directed to the audience are a powerful means to show the application of the toolkit to stakeholders (Melnik & Fineout-Overholt, 2019). Questions can be addressed throughout the presentation and at the end of the talk to provide additional information and clarity. Staff meetings and quality review meetings are potential opportunities to demonstrate the toolkit. A virtual poster presentation was submitted to also disseminate the project to students in the DNP program as well.

Dissemination was achieved by participating in calls for abstracts from professional journals and calls from professional conferences for speakers or presentations. In addition, poster presentation calls were utilized as an opportunity for the dissemination of the findings at professional conferences one such conference is through the West Coast symposium.

Conclusion

This evidence-based project developed a competency-based orientation protocol based on

requirements from accrediting bodies such as TJC and recommendations from professional organizations such as ACOG, AWHONN, and CMQCC for obstetrical emergencies. These emergencies include postpartum hemorrhage, sepsis, and hypertension, which is critical to mother-baby safety. This toolkit for competency-based orientation can be tailored to a facility's needs. The toolkit was designed to be used in a variety of settings to enable a CBO for OB units to utilize for OB emergencies.

Healthcare providers and the OB team need to work together synchronously to provide the best care. The key points ensured that the units would be ready at a moment's notice to act in concert to address crisis situations with the resources needed and good communication skills. A CBO toolkit helps to improve practice and the performance of the healthcare team. It ensures that they are communicating from the same resources, so that early and prompt intervention take place for the safety of the maternal dyad. Emergency training is a way to test, improve and maintain knowledge and skills related to obstetric emergencies. Competencies can also uncover areas in the unit needing quality improvement measures or protocol revisions. The toolkit contains competency checklists and didactic components with evaluation and simulation strategies in a high and low-tech setting. The toolkit is evidence-based through the CMQCC, which has been found to decrease maternal morbidity and mortality throughout California statistically

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Table 1

SWOT CBO orientation

	Strengths	Weaknesses
Internal	Accreditation Staff confidence Clear Outline Leadership support	Staff resistance Potential simulation costs Regular training needed Structure metrics needed
	Threats	Opportunities
External	Safety Required infrastructure Budget Buy-in	Establishment of CBO toolkit Increased staff awareness Team building Staff competency Evaluation potential Decreased Malpractice Better patient outcomes Respectful equitable care

Table 2
Logic Model

INPUTS

Table 3 Sepsis

Sepsis		Themes			
CDC Evaluation Framework:		Management of Emergencies	Simulation Training	Support for team training	Interventions related to outcomes
Engage Stakeholders Multiple levels of stakeholder engagement	CMQCC	Exceeds Criteria Obstetricians, rapid response teams, and intensive care units. introduces a two-step screening and confirmation process to more accurately diagnose and treat maternal sepsis.	Exceeds Criteria Example drills and debriefing forms. Toolkit has open access with multiple tools and checklists to ensure all stakeholders are involved.	Exceeds Criteria Supports team training with professional education slide set, and team reassessment communication tool. Provides open resource links for all levels of stakeholders.	Exceeds Criteria Provides tools and open resource training for high and low-fidelity training and education. Algorithm for maternal sepsis evaluation and order sets- includes communication emphasis. Can identify gaps in care from bedside to leadership.
	AIM	Exceeds Criteria Obstetricians, rapid response teams, and intensive care units. Uses CMQQ screening and confirmation process.	Exceeds Criteria Example drills and debriefing and departments needed for success. Provides a link to CMQCC. The Practicing for Patients: Obstetric In-Situ Drill Program Manual is provided for use in all units.	Exceeds Criteria AWHONN position statement link. Provides a safety bundle to provide respectful, equitable, and supportive care. Also, outlines briefing of leadership in all areas of care and drills.	Exceeds Criteria Includes sepsis in obstetric care change package booklet with links and EBP resources. Necessary stakeholders identified.
Describe the Program- Open resource	CMQCC	Exceeds Criteria The Improving Diagnosis and Treatment of Maternal Sepsis toolkit was	Exceeds Criteria Use of briefing, debriefing, communication techniques, closed-loop	Exceeds Criteria Identifying a readily available multidisciplinary	Exceeds Criteria Implementing rapid response protocol for the unstable patient.

		developed by the Maternal Sepsis Task Force as a resource for obstetricians, rapid response teams, and intensive care units who interact with women during pregnancy and in the postpartum period. The toolkit introduces a new pregnancy based two-step screening and confirmation process to more accurately diagnose and treat maternal sepsis.	communication, hand off scripts, time outs and SBAR. Open resource information and references. Example simulation scenarios to promote standardized learning to reinforce workflow and interventions. Focus on immediate actions at the bedside.	team to assist with the care of people experiencing obstetric sepsis or suspected sepsis. Multidisciplinary education on reduction of false positives obstetric sepsis to all clinicians and staff that provide care to pregnant and postpartum people. Standardized protocols.	Inter- and intradepartmental protocols and policies. Practical implementation aids for support bundles, antibiotic choices, and navigation through the Centers for Medicare and Medicaid Services (CMS) Sepsis-1 protocols. Maternal Sepsis Care Bundles with key principles.
	AIM	Exceeds Criteria Multiple platforms designed to lead in the development and implementation of patient safety bundles for the promotion of safe care for every U.S. birth. Elements of care are designed along central concepts of readiness, recognition, response, reporting, and respectful care. Introduction to Sepsis introduction video.	Exceeds Criteria Open resource simulation booklet that outlines objectives, patient safety bundles, institutional support, logistics, equipment options, team debriefing and review. Simulation scenarios and instructions.	Exceeds Criteria Links and resources with simulation manual with step-by-step instructions for all members of team. Standardized protocols.	Exceeds Criteria AIM develops and maintains available data resources, such as project measurement strategies for AIM Patient Safety Bundles and a Data Center for quality improvement data collection, visualization, and reporting freely. Provides data-driven rapid cycle metrics
	CMQCC	Exceeds Criteria	Exceeds Criteria	Exceeds Criteria	Exceeds Criteria

<p>Focus Evaluation and Design</p> <p>Structured frameworks</p>		<p>Standardized and practical scripts and criteria for EBP emergency evaluation of septic patient. Uses structured bundles for complete care – includes appendix for adjustments to CMS sepsis-1 criteria,</p>	<p>Multidisciplinary simulation of maternal sepsis to establish workflow and track interventions when sepsis screening criteria is met. Use of storyboards and actual patient scenarios to promote insight into areas of improvement.</p>	<p>Appendix with team reassessment communication and training.</p>	<p>Evaluation and design using maternal sepsis care bundles. Updates data and EBP on an ongoing basis.</p>
	<p>AIM</p>	<p>Exceeds Criteria</p> <p>Standardized criteria for EBP emergency evaluation of septic patient. Uses criteria for quality measures for tracking interventions against criteria. Has debriefing including patient and qualitative factors.</p>	<p>Exceeds Criteria</p> <p>In-Situ Drill program to train staff and refine protocols to ID and fix systems for optimal care.</p> <p>An educational slide set is provided as a resource.</p>	<p>Exceeds Criteria</p> <p>Includes link to Sepsis in Obstetrical Care Bundle Implementation webinar. Also, includes PDF's of change implementation with article links. The aim of the toolkit is to guide and support obstetrical care providers and their hospitals and organizations to implement methods for the timely recognition of sepsis in an organized, evidence-based response.</p>	<p>Exceeds Criteria</p> <p>Stand-alone tab for data collection. Measurement Statement: Quality improvement projects and associated measurement strategies for obstetric sepsis. Data collection plan with process, structure and outcome measures. Need for subaward agreement to be signed.</p>

Gather Credible Evidence EBP practice standards and tools	CMQCC	Exceeds Criteria Developed 2-step pregnancy-based assessment with an algorithm and flow chart for care of patients with sepsis.	Exceeds Criteria Multidisciplinary simulation of maternal sepsis allows all parties to confirm knowledge base and actions, Standardized approach with toolkit.	Exceeds Criteria Supports all members of the team with emphasis on correct gathering of data and communication strategies for all team members.	Exceeds Criteria Use of EBP criteria with dynamic toolkit with updated resources. Includes multiple appendixes for correct practice and checklists. Ongoing updates of EBP changes reflecting current data.
	AIM	Exceeds Criteria Evidence-based criteria for sepsis assessment, including obstetric-specific criteria with non-hierarchical communication. Includes patient as part of communication standard.	Exceeds Criteria A in-situ allows the practice of technical skills, teamwork, and communication in their actual care area. It also allows for the identification of potential facilities issues and barriers to care. Developed by international experts.	Exceeds Criteria Non-hierarchical communication; supports use of rapid response team for unstable patients. Evidence-based protocols for all hospital types	Exceeds Criteria Facility-wide standard protocols and policies and orders for assessment, treatment, and escalation of people with suspected or confirmed obstetric sepsis
Justify Conclusions Metric and protocol based for TJC and quality improvement	CMQCC	Exceeds Criteria Designed to quantify learning and educate OB team on sepsis management in pregnancy. Use of standardized EBP algorithms to decrease perinatal mortality. Ability to track through EHR with timelines. Has	Exceeds Criteria Debriefing and simulation with education strategies to decrease maternal and neonatal mortality. Tracking of changes in learning allows the team to	Exceeds Criteria Uses standardized diagnostics modified for pregnancy, Scripts provided for all team members to support timely recognition of sepsis in an organized, EBP	Exceeds Criteria Strict screening protocols. Uses high sensitivity of an obstetrically modified SIRS screen as a first step and then follows with the high specificity of an

		qualitative and quantitative emphasis on septic emergencies.	practice emergencies in a realistic situation to activate learning and perform interventions in safe setting and ID needs.	response for the critical pregnant patient.	evaluation for end organ injury using obstetrically modified laboratory ranges. Improves safety in all birth facilities.
	AIM	Exceeds Criteria Contains Core Data collection plans for quality improvement. Structured measures are used to assess if standardized EBP systems and materials are established to improve care. Stresses adoption and review of structures and teams in giving high quality care recorded in outcome measures.	Exceeds Criteria Impact on decreasing maternal and neonatal mortality and morbidity. Improves provider readiness, teamwork, communication, and system readiness. Has evaluation forms for learners and educators.	Exceeds Criteria Provide teams with the necessary steps for preparation to recognize, treat, and escalate care to improve outcomes through the implementation of the AIM Sepsis in Obstetric Care Patient Safety Bundle.	Exceeds Criteria Core Data Collection Plan: Quality assurance plan with measurement strategies. Adoption of EBP measures to track disaggregated data by race, ethnicity and social determinants of health. Can identify areas of improvement and intervention.
Ensure Use Lessons Learned Sustainable and Outcome based	CMQCC	Exceeds Criteria Booklet with well laid out screening and diagnostic criteria, assessment and treatment with antibiotics and source control. OB concerns in maternal sepsis and discharge education. Call to review outcomes with team.	Exceeds Criteria Use of case studies prior to simulation for engagement. Debriefing and communication are emphasized with scripts for ease of establishing inclusive communication. Sample debriefing forms.	Exceeds Criteria Screening for sepsis patient through postpartum period. Sample ways to ID in ER. Includes education on post-sepsis care for patients.	Exceeds Criteria Use of two step approach for sepsis diagnosis. Standardized protocols for easy incorporation into care. Danger signs for sepsis and infection for all discharged patients stressed.

	AIM	Exceeds Criteria A standardized approach in structured environment allows team to perfect skills and communication under the same program and increase communication and identify barriers in a step by step manual form which allows for consistent replication.	Exceeds Criteria Lessons learned from simulation provide the facility with insight and drive system changes for good patient outcomes. Provides outlines for preparation & scheduling.	Exceeds Criteria Emergency Department Screening for current or recent pregnancy. Multidisciplinary focus.	Exceeds Criteria Multidisciplinary case review. Patient education on urgent warning signs postpartum. Referral pathways and whether bias may have impacted care.

Table 4

CDC Evaluation Framework: Hemorrhage		Themes			
		Management of Emergencies	Simulation Training	Support for team training	Interventions related to outcomes
Engage Stakeholders Multiple levels of stakeholders with easy links to specific information	CMQCC	Exceeds criteria. EBP involves all levels of the hospital system that are participating in care. All information is downloadable in one source or as independent links.	Exceeds criteria. Example drills and debriefing forms with multiple tools for debriefing and materials needed. Samples for skills and communication for all clinicians.	Exceeds criteria. Multiple areas ID'ed for support from nurses, MD, administration, and push for champions. Has initial education introduction video outlining resources.	Exceeds criteria. Tools and open resources for leadership, clinicians, staff, and ancillary. Administrative support is viewed as essential.
	AIM	Exceeds criteria. EBP with multidisciplinary collaboration of all stakeholders, uses expert panels for best EBP to inform diverse range of stakeholder to provide complete, comprehensive management of OB hemorrhage.	Exceeds criteria. Conduct interprofessional interdepartmental team-based drills with timely debriefs that include the use of simulated patients from low to high fidelity.	Exceeds criteria. Collaborative approach using multidisciplinary planning from different disciplines. Includes patient and families as part of team for respectful and equitable care. Stakeholder inputs and feedback	Exceeds criteria. Multidisciplinary approach from multiple perspectives and expertise levels to deliver complete plans for managing OB hemorrhage. Fosters accountability across stakeholders.
Describe the Program- Open Access resources for data driven patient safety at State and National levels through Core safety Bundles	CMQCC	Exceeds criteria. Standardized approach, EBP safety bundle to meet facility needs, TJC's 7 elements of performance used. Care guidelines in various formats, equipment checklists, medications used in PPH, QBL worksheets and debrief forms. Delineated	Exceeds criteria. Designed to enhance readiness and competence by direct engagement with real tools and scenarios. Checklists for simulation equipment needed, case scenario examples provided, and Instructor guides with script	Exceeds criteria. In line with AIM the 4 R's template is used Readiness, recognition, response and reporting, and systems learning for improving response to OB hemorrhage and prevention in a respectful, equitable way. Risk screen table included to	Exceeds criteria. The focus is on timely recognition and response to hemorrhage. This is second update and is organized in terms of key principles, education tools, resources, background, inequities in quality of care and evidence-graded recommendations.

		through stages 0-3 with trigger alerts in poster and flow sheet format. Postpartum care included post event.	samples in easy access links.	recognize at risk patients.	Aligns with TJC's 2021 guidelines and includes prevention and sustainable quality metrics. Overview slide deck and individual sections are provided as links
	AIM	Exceeds criteria. Utilize a standardized, facility-wide, stage-based, obstetric hemorrhage emergency management plan, with checklists and escalation policies for stage-based management of patients with obstetric hemorrhage	Exceeds criteria. Includes link for practicing for patients: In-situ Drills manual In situ manual – 22 page document. Includes patient safety bundles, obtaining institutional support, logistics, equipment options, team review and debriefing and simulation scenarios.	Exceeds criteria. Reporting and learning with huddles and post-event debriefs after each emergency with multidisciplinary team. Addresses biases and implicit assumptions that may impact outcomes.	Exceeds criteria. Review best practices to foster culture of continuous improvement within the healthcare team, by systematically reviewing each OB hemorrhage event including the patient and family and discharge processes.
Focus Evaluation and Design Proactive focus and contains flowsheets, charts, graphs for hemorrhage events and follow-up with metrics for evaluation meeting TJC requirements.	CMQCC	Exceeds criteria. Care guidelines with evidence grading. Flowsheet for easy identification of hemorrhage and stage in color and reproducible. QBL worksheets. Specific team roles ID'ed for consistency and patient and family support. Includes protocol for declining blood products.	Exceeds criteria. Clear criteria for scenarios and debriefing. ID of team performance and scripts and identification of opportunities. Delineated to address all team members and communication between team with cognitive skills, technical skills, behavioral skills.	Exceeds criteria. Includes care guidelines, Hemorrhage ED visit, sample mass transfusion policy, patient and family support. Change package PDF with tools and links to IHI workbook.	Exceeds criteria. Guidelines of updated EBP with benchmarks. Standardized order sets and algorithms. Checklist for carts, trays and kits needed in hemorrhage
	AIM	Exceeds criteria. Readiness component standardized facility wide OB	Exceeds criteria. Design focuses on 5 Rs during simulation by design principles	Exceeds criteria. Design and evaluation processes for sharing data	Exceeds criteria. Designed to assess best practices, at organization and system level for

		hemorrhage emergency management plan with checklists and escalation policy, rapid response team, mass transfusion protocols. Hemorrhage cart	for scenarios that engage participants that reproduce obstetric hemorrhage situations and challenges. Design includes creating suitable settings, applying standardized patients or manikins, and incorporating relevant equipment and resources to transfer knowledge and skills.	with care teams and facility stakeholders in transparent manner to drive learning and improvement. Rapid response team with nursing, OB and anesthesia as suitable to the facilities level of care	factors that affect outcomes. Policies to ID and address root causes related to racial and ethnic disparities.
Gather Credible Evidence Open access resources from credible institutions and experts with evidence grading	CMQCC	Exceeds criteria. Up-to-date protocols and order sets with clear role ID's for clinicians. Use of EHR to track interventions via flowsheets with medications, blood products and interventions.	Exceeds criteria. Sample simulation report forms can be used and accessed in appendix links and toolkit. Examples in Sample order set staged, ample simulation scenarios and guidelines for development.	Exceeds criteria. Samples include easy links on the toolkit home page and in toolkit. Ex ED dept. guideline, working with coding staff pg 276, and blood bank. Review of policies to ID system	Exceeds criteria. Improving Health Care Response to Obstetric Hemorrhage, V3.0. includes. from Page 174 - 183 in toolkit book are key metrics for hemorrhage-related projects for identifying trends and flags for review, stresses coding, and ICD-10-PCS procedure codes.
	AIM	Exceeds criteria. Patient EBP safety bundle that is specific to improving care and outcomes for hemorrhage, uses 5R structure, with actionable measures useful in a range of facilities and resource levels.	Exceeds criteria. Evaluation of key performance indicators and obtaining feedback from participants. Intended goals of improving skills knowledge and teamwork.	Exceeds criteria. Robust data sharing evaluating the efficacy of interventions, monitoring progress towards goals, and implementing evidence-based practices.	Exceeds criteria. Measurable criteria to assess implementation and effectiveness of the bundles. Process metrics which outlines steps and actions in care to assess compliance with bundle guidelines. Includes change

					package, data collection package, data collection plan and implementation resources as links.
Justify Conclusions Metrics for use for QI and education	CMQCC	Exceeds criteria. Use of metrics to record and track emergency response. Debriefing forms standardized order sets.	Exceeds criteria. Debriefing sheets, education, scripts and evaluation samples included. Mock scenarios provided with case review guidelines. Learning objectives samples with metrics. Meets TJC specifications	Exceeds criteria. Work with all team members, including coding department, OB, Pharmacy, IT, reception, blood bank lab and staff. Standardized guidelines with metrics	Exceeds criteria. ID and monitor hemorrhage using ICD-10-PCS. Use of CDC's Severe Maternal Morbidity metric and transfusion metrics with clear numerators and denominators. Sample summary support form. Meets AHIMA coding policies. Metrics allow tracking of adherence to best practices and ID areas of improvement.
	AIM	Exceeds criteria. Clear flowsheets and EBP findings are delineated for clinicians and teams to follow using the 5Rs with rationales and Evidence based interventions used to mitigate impact of OB hemorrhage including respectful, equitable and supportive care.	Exceeds criteria. Provides patient stories for engagement, realistic situations, using team review sheets and debriefing. Allows for rigor in training programs for confirming that EBP is used to show transfer of knowledge for use with better patient outcomes.	Exceeds criteria. Processes for data reporting and sharing to update care decisions, and direct beneficial changes in care for facilities and systems disaggregated by race and ethnicity.	Exceeds criteria. Metrics to evaluate care given, quality improvement areas of focus for reducing adverse events and outcomes for unit and hospital wide measures.
Ensure Use Lessons Learned Follow-up	CMQCC	Exceeds criteria. Management Of hemorrhage from preadmission through admission and discharge.	Exceeds criteria. Debriefing sessions with metrics for cognitive, technical, and	Exceeds criteria. Equity included, with patient and family. QI codes and multiple checklists for	Exceeds criteria. Use of metric tools explained for hemorrhage for both learning and outcome

strategies and for hospital and units.		Incorporates case reviews.	behavioral skills. Evaluations, to support improvement in knowledge gap, system support, unit processes and education.	meeting emergency needs to advert poor outcomes.	measures. Talking points for post events and simulation.
	AIM	Exceeds criteria. Reporting and learning with huddles and post-event debriefs when hemorrhages occur to ID successes, opportunities and steps for future cases.	Exceeds criteria. Sharing data with the team and stakeholders from input and feedback from simulation can help drive QI initiatives and knowledge gaps on all units with providers, team members patients and families.	Exceeds criteria. Metrics provide sharing of data. Lessons learned from debriefs and direct feedback, Multidisciplinary reviews to recognize system problems.	Exceeds criteria. Outlines processes for data reporting and data sharing with the obstetric rapid response team, care providers, and facility stakeholders.

Table 5

CDC Evaluation Framework: Hemorrhage		Themes			
		Management of Emergencies	Simulation Training	Support for team training	Interventions related to outcomes
Engage Stakeholders Multiple levels of stakeholders with easy links to specific information	CMQCC	Exceeds criteria. EBP involves all levels of the hospital system that are participating in care. All information is downloadable in one source or as independent links.	Exceeds criteria. Example drills and debriefing forms with multiple tools for debriefing and materials needed. Samples for skills and communication for all clinicians.	Exceeds criteria. Multiple areas ID'ed for support from nurses, MD, administration, and push for champions. Has initial education introduction video outlining resources.	Exceeds criteria. Tools and open resources for leadership, clinicians, staff, and ancillary. Administrative support is viewed as essential.
	AIM	Exceeds criteria. EBP with multidisciplinary collaboration of all stakeholders, uses expert panels for best EBP to inform diverse range of stakeholder to provide complete, comprehensive management of OB hemorrhage.	Exceeds criteria. Conduct interprofessional interdepartmental team-based drills with timely debriefs that include the use of simulated patients from low to high fidelity.	Exceeds criteria. Collaborative approach using multidisciplinary planning from different disciplines. Includes patient and families as part of team for respectful and equitable care. Stakeholder inputs and feedback	Exceeds criteria. Multidisciplinary approach from multiple perspectives and expertise levels to deliver complete plans for managing OB hemorrhage. Fosters accountability across stakeholders.
Describe the Program- Open Access resources for data driven patient safety at State and National levels through Core safety Bundles	CMQCC	Exceeds criteria. Standardized approach, EBP safety bundle to meet facility needs, TJC's 7 elements of performance used. Care guidelines in various formats, equipment checklists, medications used in PPH, QBL worksheets and debrief forms. Delineated	Exceeds criteria. Designed to enhance readiness and competence by direct engagement with real tools and scenarios. Checklists for simulation equipment needed, case scenario examples provided, and Instructor guides with script	Exceeds criteria. In line with AIM the 4 R's template is used Readiness, recognition, response and reporting, and systems learning for improving response to OB hemorrhage and prevention in a respectful, equitable way. Risk screen table included to	Exceeds criteria. The focus is on timely recognition and response to hemorrhage. This is second update and is organized in terms of key principles, education tools, resources, background, inequities in quality of care and evidence-graded recommendations. Aligns with TJC's

		through stages 0-3 with trigger alerts in poster and flow sheet format. Postpartum care included post event.	samples in easy access links.	recognize at risk patients.	2021 guidelines and includes prevention and sustainable quality metrics. Overview slide deck and individual sections are provided as links
	AIM	Exceeds criteria. Utilize a standardized, facility-wide, stage-based, obstetric hemorrhage emergency management plan, with checklists and escalation policies for stage-based management of patients with obstetric hemorrhage	Exceeds criteria. Includes link for practicing for patients: In-situ Drills manual In situ manual – 22 page document. Includes patient safety bundles, obtaining institutional support, logistics, equipment options, team review and debriefing and simulation scenarios.	Exceeds criteria. Reporting and learning with huddles and post-event debriefs after each emergency with multidisciplinary team. Addresses biases and implicit assumptions that may impact outcomes.	Exceeds criteria. Review best practices to foster culture of continuous improvement within the healthcare team, by systematically reviewing each OB hemorrhage event including the patient and family and discharge processes.
Focus Evaluation and Design Proactive focus and contains flowsheets, charts, graphs for hemorrhage events and follow-up with metrics for evaluation meeting TJC requirements.	CMQCC	Exceeds criteria. Care guidelines with evidence grading. Flowsheet for easy identification of hemorrhage and stage in color and reproducible. QBL worksheets. Specific team roles ID'ed for consistency and patient and family support. Includes protocol for declining blood products.	Exceeds criteria. Clear criteria for scenarios and debriefing. ID of team performance and scripts and identification of opportunities. Delineated to address all team members and communication between team with cognitive skills, technical skills, behavioral skills.	Exceeds criteria. Includes care guidelines, Hemorrhage ED visit, sample mass transfusion policy, patient and family support. Change package PDF with tools and links to IHI workbook.	Exceeds criteria. Guidelines of updated EBP with benchmarks. Standardized order sets and algorithms. Checklist for carts, trays and kits needed in hemorrhage
	AIM	Exceeds criteria. Readiness component standardized facility wide OB hemorrhage	Exceeds criteria. Design focuses on 5 Rs during simulation by design principles for scenarios that	Exceeds criteria. Design and evaluation processes for sharing data with care teams	Exceeds criteria. Designed to assess best practices, at organization and system level for factors that affect

		emergency management plan with checklists and escalation policy, rapid response team, mass transfusion protocols. Hemorrhage cart	engage participants that reproduce obstetric hemorrhage situations and challenges. Design includes creating suitable settings, applying standardized patients or manikins, and incorporating relevant equipment and resources to transfer knowledge and skills.	and facility stakeholders in transparent manner to drive learning and improvement. Rapid response team with nursing, OB and anesthesia as suitable to the facilities level of care	outcomes. Policies to ID and address root causes related to racial and ethnic disparities.
Gather Credible Evidence Open access resources from credible institutions and experts with evidence grading	CMQCC	Exceeds criteria. Up-to-date protocols and order sets with clear role ID's for clinicians. Use of EHR to track interventions via flowsheets with medications, blood products and interventions.	Exceeds criteria. Sample simulation report forms can be used and accessed in appendix links and toolkit. Examples in Sample order set staged, ample simulation scenarios and guidelines for development.	Exceeds criteria. Samples include easy links on the toolkit home page and in toolkit. Ex ED dept. guideline, working with coding staff pg 276, and blood bank. Review of policies to ID system	Exceeds criteria. Improving Health Care Response to Obstetric Hemorrhage, V3.0. includes. from Page 174 -183 in toolkit book are key metrics for hemorrhage-related projects for identifying trends and flags for review, stresses coding, and ICD-10-PCS procedure codes.
	AIM	Exceeds criteria. Patient EBP safety bundle that is specific to improving care and outcomes for hemorrhage, uses 5R structure, with actionable measures useful in a range of facilities and resource levels.	Exceeds criteria. Evaluation of key performance indicators and obtaining feedback from participants. Intended goals of improving skills knowledge and teamwork.	Exceeds criteria. Robust data sharing evaluating the efficacy of interventions, monitoring progress towards goals, and implementing evidence-based practices.	Exceeds criteria. Measurable criteria to assess implementation and effectiveness of the bundles. Process metrics which outlines steps and actions in care to assess compliance with bundle guidelines. Includes change package, data

					collection package, data collection plan and implementation resources as links.
Justify Conclusions Metrics for use for QI and education	CMQCC	Exceeds criteria. Use of metrics to record and track emergency response. Debriefing forms standardized order sets, including racial disparities.	Exceeds criteria. Debriefing sheets, education, scripts and evaluation samples included. Mock scenarios provided with case review guidelines. Learning objectives samples with metrics. Meets TJC specifications	Exceeds criteria. Work with all team members, including coding department, OB, Pharmacy, IT, reception, blood bank lab and staff. Standardized guidelines with metrics	Exceeds criteria. ID and monitor hemorrhage using ICD-10-PCS. Use of CDC's Severe Maternal Morbidity metric and transfusion metrics with clear numerators and denominators. Sample summary support form. Meets AHIMA coding policies. Metrics allow tracking of adherence to best practices and ID areas of improvement.
	AIM	Exceeds criteria. Clear flowsheets and EBP findings are delineated for clinicians and teams to follow using the 5Rs with rationales and Evidence based interventions used to mitigate impact of OB hemorrhage including respectful, equitable and supportive care.	Exceeds criteria. Provides patient stories for engagement, realistic situations, using team review sheets and debriefing. Allows for rigor in training programs for confirming that EBP is used to show transfer of knowledge for use with better patient outcomes.	Exceeds criteria. Processes for data reporting and sharing to update care decisions, and direct beneficial changes in care for facilities and systems disaggregated by race and ethnicity.	Exceeds criteria. Metrics to evaluate care given, quality improvement areas of focus for reducing adverse events and outcomes for unit and hospital wide measures.
Ensure Use Lessons Learned Follow-up strategies and for hospital and	CMQCC	Exceeds criteria. Management Of hemorrhage from preadmission through admission and discharge. Incorporates case reviews.	Exceeds criteria. Debriefing sessions with metrics for cognitive, technical, and behavioral skills. Evaluations, to	Exceeds criteria. Equity included, with patient and family. QI codes and multiple checklists for meeting emergency	Exceeds criteria. Use of metric tools explained for hemorrhage for both learning and outcome measures. Talking points for post

units.			support improvement in knowledge gap, system support, unit processes and education.	needs to advert poor outcomes.	events and simulation.
	AIM	Exceeds criteria. Reporting and learning with huddles and post-event debriefs when hemorrhages occur to ID successes, opportunities and steps for future cases.	Exceeds criteria. Sharing data with the team and stakeholders from input and feedback from simulation can help drive QI initiatives and knowledge gaps on all units with providers, team members patients and families.	Exceeds criteria. Metrics provide sharing of data. Lessons learned from debriefs and direct feedback, Multidisciplinary reviews to recognize system problems.	Exceeds criteria. Outlines processes for data reporting and data sharing with the obstetric rapid response team, care providers, and facility stakeholders.

Table 5 CDC Framework with cross steps of relevant standards

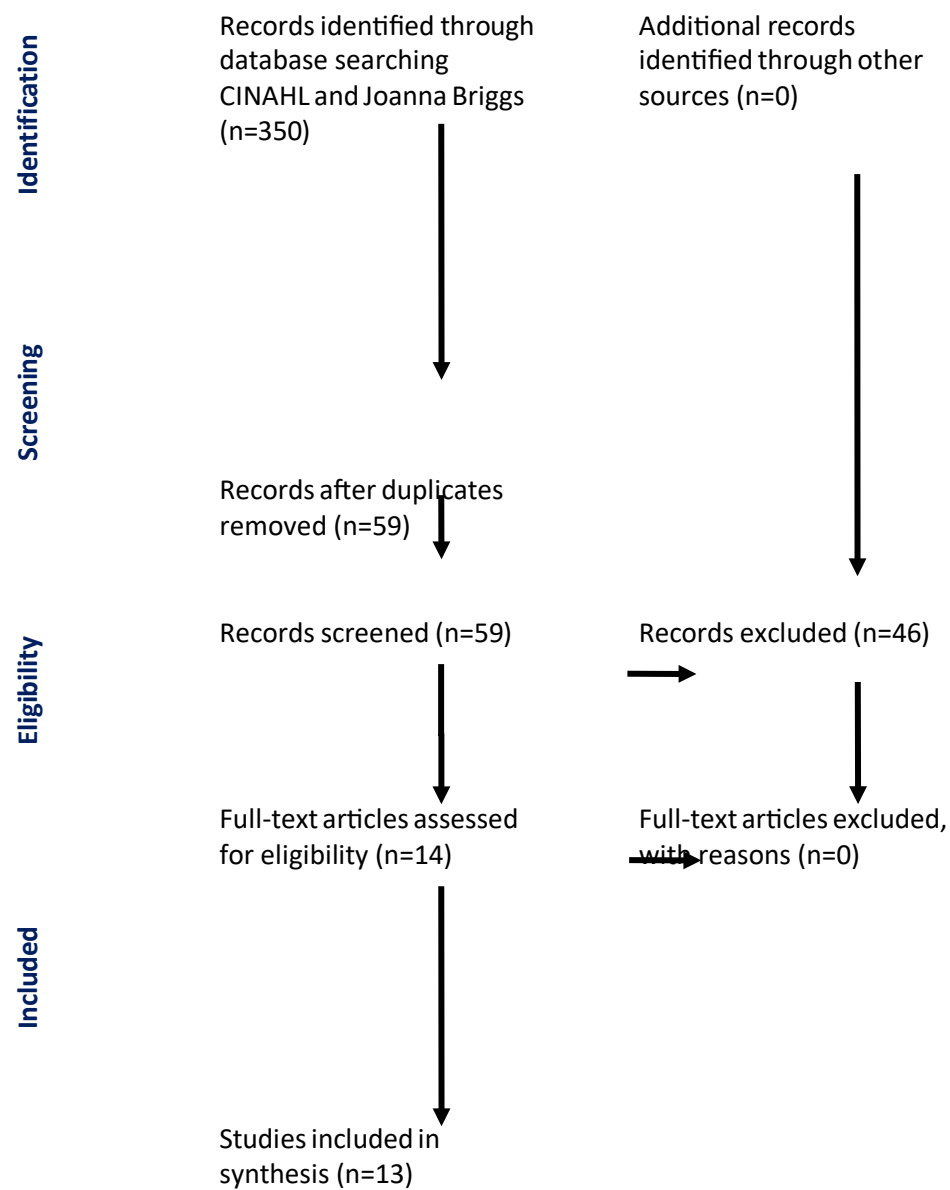
CDC Evaluation Program	AIM	Alignment with CDC program evaluation framework and standards	CMQCC
Engage stakeholder	2	Clearly identifies stakeholders in each tool and relevancy for the organization. Provides a statement of the problem. Provides formal agreements. Discloses conflict of interest. Provides for metaevaluation of data and who collects and rationale.	2
Describe the Program	2	Clearly describes purpose, goals and objectives. Dashboard for metrics provided. Simulation programs are outlined from low to high resources settings. Context analysis appropriate to meet unique facility needs.	2
Focus Evaluation Design	2	Defines the purpose of the toolkit bundles. Identifies outcomes to be measured with metrics. Includes coding staff and leadership in evaluation and design. Has algorithms and flowsheets built in with described purposes and procedures for impact evaluation.	2
Gather Credible Evidence	2	All sources of evidence are defined with links to resources as indicated. Includes information scope and selection. Information is backed by research. Criteria for each indicator have	2

		numerator and denominator, and purpose for metric. Indicators chosen can be used to identify gaps. Includes use of disaggregated data for racial disparity. Information scope and selection are defined for validity and reliability in a systematic manner. Provides for micro and metaevaluation.	
Justify Conclusions	2	Indicators chosen demonstrated alignment with Federal and accreditation purposes. Metrics used can show adherence to best practices. Tools utilized can identify areas of need through data tracking and analysis of quantitative and qualitative information.	2
Ensure Use and Lessons Learned.	1	Identifies opportunities for growth and unit development. Supports change in hospital culture and practices. Updated with lessons learned from organizations. System-based learning components with impartial reporting.	2

Table 6*Frequency Table -Cross-steps framework and standards*

Variable	<i>n</i>	%
Engage stakeholder		
Exceeds	2	100.00
Missing	0	0.00
Describe the Program		
Exceeds	2	100.00
Missing	0	0.00
Focus Evaluation Design		
Exceeds	2	100.00
Missing	0	0.00
Gather Credible Evidence		
Exceeds	2	100.00
Missing	0	0.00
Justify Conclusions		
Exceeds	2	100.00
Missing	0	0.00
Ensure Use and Lessons Learned		
Exceeds	1	50.00
Meets	1	50.00
Missing	0	0.00

Note. Due to rounding errors, percentages may not equal 100%.

Figure 1**PRISMA Flowchart Diagram**

Note. Prisma flow chart diagram from “Preferred Reporting Items for Systematic Reviews and Meta-analyses: The PRISMA Statement,” by D. Moher, A. Liberati, J. Tetzlaff, & D. G. Altman, 2009, *Annals of Internal Medicine*, 151(4), p. 267 (<http://dx.doi.org/10.7326/0003-4819-151-4-200908180-00135>).

Appendix A

Summary of Primary Research Evidence

Citation	Design Level Quality Grade	Sample Sample size	Intervention Comparison	Study type	Outcome Definition	Usefulness Results Key Findings
Afulani, P. A., Aborigo, R. A., Walker, D., Moyer, C. A., Cohen, S., & Williams, J. (2019). Can an integrated obstetric emergency simulation training improve respectful maternity care? results from a pilot study in Ghana. <i>Birth</i> , 46(3), 523–532. https://doi.org/10.1111/birt.12418	Level II A	High volume maternity setting, in resource-poor region, Ghana. Women pre intervention n=268 baseline Women post intervention n=318 endline	Simulation training in RMC was instituted, in 5 hospitals including 1 tertiary center. 25 providers Midwives n=22 Physicians n=2 Anesthetist n=1 Nurses n=18 Use of person-centered maternity care scale. Compared demographics and confounding variables for validity/reliability of women delivering pre-intervention and post intervention	Prospective interventional Study: a randomized pilot study of patient perception of satisfaction using before and after interviews with a validated questionnaire.	The outcome revealed RMC increase of 43%. Scores on the subscales also increased between baseline and endline: 15% increase for dignity and respect, 87% increase for communication and autonomy, and 55% increase for supportive care. These differences remained significant in multivariate analysis controlling for several potential	Interventions targeting RMC can improve women's childbirth experiences Low-tech high-fidelity simulations can increase patient satisfaction in emergency situations. Future research is needed evaluate the effect of the intervention on not just RMC, but also on other maternal and neonatal health outcomes such as health-

					confounders.	seeking behaviors, morbidity, and mortality
Fransen, A. F., van de Ven, J., Schuit, E., van Tetering, A. A. C., Mol, B. W., & Oei, S. G. (2017). Simulation-based team training for multiprofessional obstetric care teams to improve patient outcome: A multicenter, cluster randomized controlled trial. <i>Obstetric Anesthesia Digest</i> , 37(4), 199–200.	I C	24 OB units Netherlands n=28,657 randomized 1 year duration Measured obstetric complications, i.e., low Apgar score, severe postpartum hemorrhage, trauma due to shoulder dystocia, eclampsia, and hypoxic-ischemic encephalopathy	471 medical professionals received 1-day multiprofessional, simulation-based team training- compared to no 1-day training- using patient actors All obstetric units were allowed to continue local individual skills training programs during the study	Clustered RCT	Outcome of obstetric complications did not differ between study groups - -Team training reduced trauma due to shoulder dystocia (OR 0.50, 95% CI 0.25–0.99) and increased invasive treatment for severe postpartum hemorrhage (OR 2.2, 95% CI 1.2–3.9) compared with no intervention. Other outcomes did not differ between study groups.	Training in simulation center, limited to 1 day. Results might show training facilitates teamwork and communication Out of hospital midwives not part of training- where transfer of care occurs for complications. Robust study using simulation training 1 day duration
Otchi, E. H., Esena, R. K., Srofenyoh, E., Ameh, E. O., Asah-Opoku, K., Beyuo, T., Ken-Amoah, S., Oduro, F., Agbeno, E. K., & Marfo, K. (2021). Health systems factors associated with adverse events among hospitalized obstetric clients in a tertiary health care facility in Ghana. <i>Journal of</i>	II A	650 obstetric clients in tertiary hospital setting Ghana randomized into two arms	A 62-item questionnaire to identify various causes of AEs was developed, framed by Global	Retrospective controlled study of medical records assessing risk	Leadership and governance (inadequate use of protocol and adherence) accounted for	- Inadequate use of protocol and adherence is a major cause of preventable AEs identified in

<p><i>Patient Safety</i>, 17(8). https://doi.org/10.1097/pts.0000000000000904</p>			<p>Trigger Tool, with inter rater reliability. Goodness-of-fit measures used. The reliability and validity of the scale tested using Cronbach α coefficient.</p>	<p>factors for AEs in hospitalized Ob patients</p>	<p>the most causes of AEs among obstetric clients</p>	<p>this study -Identifying the causative factors Of AEs is an important first step toward prevention</p>
<p>Sheen, J.-J., Lee, C., & Goffman, D. (2018). The utility of bedside simulation for training in <i>Critical Care Obstetrics</i>. <i>Seminars in Perinatology</i>, 42(1), 59–63. https://doi.org/10.1053/j.semperi.2017.11.010</p>	III C	<p>Obstetric setting in tertiary hospital Arizona</p>	<p>Review of effects of simulation training in hospital setting</p>	<p>Single study hospital, non-randomized improvement in high-risk pregnancies in US hospital</p>	<p>1) To enhance education and training in maternal care, (2) To improve the medical management of pregnant women around the country (3) To address critical research gaps in maternal medicine</p>	<p>Contributes to knowledge base of benefits of training and simulation in OB critical care setting as specified by TJC and ACOG</p> <p>Contributes to information on high-risk patient statistics</p>
<p>American College of Obstetricians and Gynecologists (ACOG). (2017). Postpartum hemorrhage. <i>ACOG Practice Bulletin</i>, 130(4).</p>	IV A	<p>Accredited hospitals US</p>	<p>Clinical management for pp hemorrhage</p>	<p>Protocol for recognizing hemorrhage</p>	<p>Clinical practice guidelines</p>	<p>Hemorrhage drills identify management Pitfalls in emergency settings. Drills and simulation improve competence and knowledge.</p> <p>Has modifiable checklists, to</p>

						identify and correct systems issues, and make certain good management of hemorrhage.
<p>Lutgendorf, M.A., Spalding, C., Drake, E., Spence, D., Heaton, J.O., and Morocco, K.V. (2017). Multi-disciplinary in situ simulation-based training as a postpartum hemorrhage quality improvement project. <i>Military Science</i>, 182(3-4), doi.org/10.7205/MILMED-D-16-00030. Retrieved from https://academic.oup.c</p>	Level II-A	n=113 Multi-disciplinary participants from OB, Anesthesia, Nursing, Peds, and phlebotomy/blood bank	Intervention:16 scenarios held over two-day period using high fidelity, multi-disciplinary in situ simulation training to evaluate hospital protocols, team performance, operational readiness, and system improvements. On HTN, shoulder dystocia, PPH	Quantitative, Quasi-Experimental, Time Series Study Design	<p>Outcomes evaluate a multi-disciplinary team's comfort with managing PPH, Shoulder dystocia, HTN emergencies multi-disciplinary team's setting using self-reported questionnaires.</p> <p>Measured time to prepare blood products.</p> <p>Statistical difference in pre-post confidence levels and time management with improved outcomes.</p>	<p>Contributes to support for teamwork for handling OB emergencies</p> <p>Support for skills maintenance, in a safe setting and OB emergencies drills for staff efficacy</p> <p>Identification of gaps for process improvement can be discovered</p>
Weiner, C. P., Collins, L., Bentley, S., Dong, Y., & Satterwhite, C. L. (2016). Multi-	III A	N=14309 deliveries from 1/2006-	Intervention: use of PROMPT	Observational study over 7	Measured outcomes over	- Annual training reduced

professional training for obstetric emergencies in a US hospital over a 7-year interval: An observational study. <i>Journal of Perinatology</i> , 36 (1), 19–24. https://doi.org/10.1038/jp.2015.136		12/2014 In US hospital	course for annual training (Practical Obstetric Multi-Professional Training)	year period, also included data 2 years prior to project start. Use of statistical analysis to generate outcomes.	expanded time with large number of patients, study showed a progressive decrease in rates of brachial plexus injury. and umbilical artery pH < 7.00 Reduced rates (P < 0.05) of cesarean section, episiotomy and higher perception of nurse/ physician communication were documented. Hypoxic ischemic encephalopathy (HIE) rates declined progressively by > 50%.	adverse outcomes Teambuilding was seen as Training can be beneficial even with younger staff and higher acuity of patients. Training is cost-effective when viewed in the context of good health outcomes and birth injury lawsuits.
Aktas, S., Aydin, R., Osmanagaoglu, M. A., Burma, E., Biryasil, B., Ece, Ö., Aran, T., & Gunduz, A. (2021). The effect of simulation-based vaginal birth and obstetrical emergency training for emergency health professionals: A quasi experimental study. <i>Journal of Basic and Clinical Health Sciences</i> , 5(3), 137–144. https://doi.org/10.30621/jbachs.949842	II B	N=34 23 MD 11RN Recruitment Volunteers University teaching hospital	Pretest post-test design Intervention of 8 hours of simulation and trainings with high fidelity simulations,	Quasi-experimental	Following simulations participants filled out pre and post tests Significant results for increased	Small sample size Supports active learning, team collaboration and learner satisfaction

			prebrief/ debrief recorded with Vaginal birth, SD, PPH, cord prolapse		knowledge base about vaginal birth and OB emergencies. Clinician rated highly	Used high fidelity simulation
van de Ven, J., Fransen, A. F., Schuit, E., van Rinnard Heimel, P. J., Mol, B. W., & Oei, S. G. (2017). Does the effect of one-day simulation team training in obstetric emergencies decline within one year? A post-hoc analysis of a multicentre cluster randomised controlled trial. <i>European journal of obstetrics, gynecology, and reproductive biology</i> , 216, 79–84. https://doi.org/10.1016/j.ejogrb.2017.07.020	1 A	N= 24 OB units- with 29,063 patients Randomized 13,975 intervention 15,088 in the control Team training vs no team training Holland Participants N- 74 MD's, 36 residents, 79 CNM, 282 RN's	Team training vs no team training in OB emergency	RCT	Multicenter, cluster randomized controlled trial revealed that a one-day, multi-professional, simulation-based obstetric team training in a simulation center, focusing on teamwork skills, did not reduce a composite of obstetric complications. Shows need for repetitive practice every 3 months	Shows need for repetitive practice every 3 months Outcomes measured- low APGAR score<7 at 5 min, PPH needing 4 U PRBC's showed positive results High participation rates of OB units with good team mixture Results high in first quarter with team training – no difference in outcomes next 3 quarters.

Appendix B

Summary of Systemic Reviews

Citation	Quality Grade	Question	Search Strategy	Inclusion/Exclusion Criteria	Data Extraction and Analysis	Key Findings	Usefulness/ Recommendation/ Implications
Ameh, C. A., Mdegela, M., White, S., & Van den Broek, N. (2019). The effectiveness of training in emergency obstetric care: A systematic literature review. <i>Health Policy and Planning</i> , 34(4), 257–270. https://doi.org/10.1093/heapol/czz028	I A	Conducted a systematic review of studies that have evaluated the effectiveness of training in EmOC or components of EmOC.	-Systematic reviews and reporting based on Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA). PUBMED, EMBASE, COCHRANE library, SCOPUS, IMEMR (Eastern Mediterranean Index Medicus), ERIC, CINHALL (EBSCO). websites of key international organizations known to be involved with EmOC training (World Health Organization-WHO, United Nations Population Fund for Population Activities-UNFPA, United Nations Children Fund-UNICEF, John	-Reports which described the evaluation of in-service EmOC training programs or courses and/or including any of the components of EmOC such as neonatal resuscitation were included. -Publications were excluded if they were conference abstracts, study protocols, literature reviews of training methodology and equipment, or related to training for traditional birth attendants.	Author results: 1)Evaluation of (n=26) Participant's reaction to training=positive participant response, for usefulness, acceptability and increased quality care 2) Evaluation of (n=42) change in knowledge and skills= Improved knowledge and skills pre and post except those already experts. Long-term noted knowledge and skill reduction after 3 -16 months post training 3) Eval Change in clinical practice (n=51)= knowledge and skills showed improvement by pre-posttest,	-Short competency-based training in emergency obstetric care results in significant improvements in healthcare provider competence and change in clinical practice. -Short competency-based training results in improved health outcomes.	Evaluated globally studies on 4 parameters of emergency OB care Supports competency based training of emergency care as useful and effective. Support for need to have update/practice on quarterly basis to maintain skills. Barriers to care identified were staff attrition and need for supplies. Training is well received by participants. Multi-disciplinary training is effective in improving healthcare provider knowledge, skills, communication and team working.

Citation	Quality Grade	Question	Search Strategy	Inclusion/Exclusion Criteria	Data Extraction and Analysis	Key Findings	Usefulness/ Recommendation/ Implications
			Hopkins Program for International Education in Gynecology and Obstetrics- JPHIEGO, Pathfinder, Population Council, Advanced Life Support Group, Child health Advocacy International, International Confederation of Midwives-ICM, International Federation of Obstetrics and Gynecology-FIGO, Royal College of Obstetrics and Gynecology		competency pre-post, documentation, and protocol adherence (n=11) Improved communication in RCT (n=3) 4) Eval Availability and quality of EmOC and health outcomes. (n=21) Positive change for request for support, increase client satisfaction scores by improved patients interactions.		Knowledge and skills can be retained by up to 12 months especially with 'booster' training. Need for functional health system including adequate resources, organization and financing
Merriel, A., van der Nelson, H. A., Lenguerrand, E., Chung, Y., Soar, J., Ficquet, J., Grey, S., Winter, C., Draycott, T., & Siassakos, D. (2016). Emergency training for in-hospital-	II A	-Examines the effect of Emergency training for in-hospital-based healthcare providers: effects on clinical practice and patient outcomes	Broad scope review- sensitive search strategy with Cochrane library, MEDLINE, EMBASE, CINAHL, ERIC, Trial registries, WHO, ClinicalTrial.gov NIH	- RCTs including cluster and step-wedge randomization for cluster trials• Non-randomized controlled trials, e.g. intervention allocation by geographical location- Observational studies including Controlled before-after studies with a minimum of	Fixed-effect meta-analysis with Mantel-Haenszel model. Review Manager supplemented by Stata Statistical Software	= Assess all specialties for interactive educational interventions to improve hospital-based healthcare staff reactions in emergencies to improve outcomes.	- development of training interventions to address the clinical and human factors in the emergency response Offers comparison of training modalities across specialties

Citation	Quality Grade	Question	Search Strategy	Inclusion/Exclusion Criteria	Data Extraction and Analysis	Key Findings	Usefulness/ Recommendation/ Implications
based healthcare providers: Effects on clinical practice and patient outcomes. <i>Cochrane Database of Systematic Reviews, (5)</i> . https://doi.org/10.1002/14651858.cd012177				two interventions on and two control groups interrupted time series, including repeated-measure studies		Studies behavioral change, practice and outcomes acquisition of knowledge and skills. interactive training interventions, both medical and surgical, to identify essential components for effective training common to all situations. It will focus on patient and organizational outcomes, rather than on acquisition of knowledge or user rating of training.	
Brogaard, L., Glerup Lauridsen, K., Løfgren, B., Krogh, K., Paltved, C., Boie, S., & Hvidman, L. (2021). The effects of obstetric emergency team training on patient outcome: A	B	- Aimed to review how simulation-based team training affects patient outcomes in obstetric emergencies.	- MEDLINE, Embase, Cochrane Library, and Cochrane Central Register of Controlled Trials were searched up to and including 15 May, 2021.	Selection criteria: randomized controlled trials (RCTs) and cohort studies on obstetric teams in high- resource settings comparing the effect of simulation- based obstetric emergency team training with no training on the risk of Apgar scores less than 7	Data collection and analysis: The included studies were assessed using PRISMA, EPCO, and GRADE. 21 studies, four RCTs and 17 cohort studies, evaluating	- Emerging evidence suggests an effect of obstetric team training on obstetric outcomes - reduced brachial plexus injury- 6 studies -positive effect on	-Staff liked simulation training feeling confident and prepared -Training can be costly but cost-effective - Showed gap in how

Citation	Quality Grade	Question	Search Strategy	Inclusion/Exclusion Criteria	Data Extraction and Analysis	Key Findings	Usefulness/ Recommendation/ Implications
systematic review and meta-analysis. <i>Acta Obstetrica Et Gynecologica Scandinavica</i> , 101(1), 25–36. https://doi.org/10.1111/aogs.14263			Authors the protocol for system-atic reviews by using the assessment tools PRISMA, EPCO, and GRADE	at 5 min, neonatal hypoxic ischemic encephalopathy, severe postpartum hemorrhage, blood transfusion of four or more units, and delay of emergency cesarean section by more than 30 min.	patient outcomes after obstetric team training compared with no training. Patient outcomes were measured to evaluate the effect of simulation-based training and they are internationally defined and reported.	Apgar below 7 at 5 min -unclear results on umbilical cord prolapse, c-section decision to incision And severe PPH In situ-IPE simulation demonstrated best effect	often training should take place
Beck, C., Gallagher, K., Taylor, L. A., Goldstein, J. A., Mithal, L. B., & Gernand, A. D. (2021). Chorioamnionitis and risk for maternal and neonatal sepsis. <i>Obstetrics & Gynecology</i> , 137(6), 1007–1022. https://doi.org/10.1	II A	To estimate the risk of maternal and neonatal sepsis associated with chorioamnionitis.	PubMed, BIOSIS, and ClinicalTrials.gov databases were systematically searched for full-text articles in English from inception until 11 May 2020.	103 studies were included, and 55 met criteria for meta-analysis (39 studies of preterm neonates, 10 studies of general populations of preterm and term neonates, and six studies of late preterm and term neonates)	Authors screened 1,251 studies. Randomized controlled trials, case-control, or cohort studies quantifying a relationship between chorioamnionitis and sepsis in mothers (postpartum) or neonates born at	Key findings support current guidelines for preventative neonatal care Both histologic and clinical chorioamnionitis were associated with early- and late-onset sepsis in neonates	Correlation between chorio and maternal sepsis with insufficient evidence,

Citation	Quality Grade	Question	Search Strategy	Inclusion/Exclusion Criteria	Data Extraction and Analysis	Key Findings	Usefulness/ Recommendation/ Implications
097/aog.0000000000004377					greater than 22 weeks of gestation were eligible. Studies were grouped for meta-analyses according to exposures of histologic or clinical chorioamnionitis and outcomes of maternal or neonatal sepsis.		
Fransen, A. F., van de Ven, J., Banga, F. R., Mol, B. W., & Oei, S. G. (2020). Multi-professional simulation-based team training in obstetric emergencies for improving patient outcomes and trainees' performance. <i>Cochrane Database of Systematic Reviews</i> . https://doi.org/10.1002/14651858.cd011545.pub2	I A	To determine the effect of simulation-based obstetric team training on patient outcomes, performance of the obstetric care team in practice and educational settings, and trainees' experience, when compared to no training or another type of training.	The Cochrane Pregnancy and Childbirth Group's Trials Register, ClinicalTrials.gov and the WHO International Clinical Trials Registry Platform (ICTRP) were searched (14 April 2020), together with references checking and hand searching the available proceedings of 2 international conferences.	The authors included randomized controlled trials (RCTs) (including cluster-randomized trials) comparing simulation-based obstetric team training with no, or other types of training. Authors included eight RCTs, six of which were cluster-randomized trials, involving more than 1000 training participants and more than 200,000 pregnancies/births. Four studies reported on outcome measures on Kirkpatrick level 4 (patient outcome), three studies on Kirkpatrick level 3	Data from three cluster-randomized trials could be used to perform generic inverse variance meta-analyses. The meta-analyses were based on risk ratios (RRs) and mean differences (MDs) with 95% confidence intervals (CIs). We used the GRADE approach to rate the certainty of the evidence. We used Kirkpatrick's model of training evaluation to categorize the outcomes of interest; we chose	Simulation-based obstetric team training might be helpful for the improvement of team performance and specific maternal and perinatal outcomes. Improved outcomes such as shoulder dystocia, a slight decrease in c-section rate and newborn mortality were noted. High-certainty evidence is lacking due to serious risk of	Showed limited effect on outcomes related to maternal or perinatal adverse events, low Apgar score, or maternal mortality. Simulation-based obstetric team training may help to improve team performance of obstetric teams, and it might contribute to improvement of specific maternal and perinatal outcomes, compared with no training.

Citation	Quality Grade	Question	Search Strategy	Inclusion/Exclusion Criteria	Data Extraction and Analysis	Key Findings	Usefulness/ Recommendation/ Implications
				(performance in practice), two studies on Kitpatrick level 2 (performance in educational settings),	Level 3 (behavioral change) and Level 4 (patient outcome) to categorize the primary outcomes.	bias and imprecision, and the effect cannot be generalized for all outcomes.	
Walter, J. K., & Terry, L. M. (2021). Factors influencing nurses' engagement with CPD activities: A systematic review. <i>British Journal of Nursing</i> , 30(1), 60–68. https://doi.org/10.12968/bjon.2021.30.1.60	III A	What factors influence hospital-based nurses' engagement with CPD activities in the UK?	Database searches for published and grey literature from January 1995 to November 2018 were conducted via EBSCO Discovery Service, the British Nursing Index and the British Library.	An approved systematic review protocol was followed with studies then assessed against strict inclusion and exclusion criteria. Studies were excluded if the profession or workplace was unclear, nurses were not the respondents, or data were inseparable from non-nurses or non-hospital-based nurses in the study	Database searches for published and grey literature from January 1995 to November 2018 were conducted via EBSCO Discovery Service, the British Nursing Index, and the British Library. The Cochrane and Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines informed processes CPD education enables nurses to question care, provide quality care and develop extended skills. Factors need to be considered for cost-	Forty-two findings were aggregated into 35 categories then synthesized into four over-arching themes: individual resources, nurses' professional motivation, organizational commitment to learning and development and managerial support Factors influencing nurses' engagement with activities are multifaceted and inter-woven. A question-based checklist to facilitate discussions between nurses	Factors influencing CPD engagement as nurses' individual resources, professional motivation, organizational commitment to learning and development, and managerial support. Educators can facilitate CPD for individuals and organizations, thereby safeguarding care standards Checklist developed to standardize CPD

Citation	Quality Grade	Question	Search Strategy	Inclusion/Exclusion Criteria	Data Extraction and Analysis	Key Findings	Usefulness/ Recommendation/ Implications
					effectiveness and nurse retention.	and educators, managers or appraisers is presented.	

Legend - Key:

EmOC - Emergency Medical care Obstetric patient

RMC - Respectful maternity care

AE - adverse event

OB - Obstetrics

HTN - hypertension

SD - Shoulder dystocia

PPH - Postpartum Hemorrhage

US - United States

Chorio - chorioamnionitis

CPD - Continuing professional development

DNP-	NUR7801 I																NUR7802 II							
Activity	Wk. 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12	Wk 13	Wk 14	Wk 15		Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8
Meet with faculty weekly -	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x
Mentor conference biweekly	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x
Prepare project proposal				x	x	x	x	x	x	x	x	x	x	x			x	x	x	x	x	x	x	x
Alt Project-Problem statement		x	x	x																				
Intro -Problem statement					x																			
Purpose of program review and project development					x	x																		
Framework, EB search & results							x																	
Search strategy, evidence tables								x																
Program analysis and evaluation plan										x														
Dissemination plan											x													
Proposal revisions												x	x	x										
Review of proposal																	x				x	x	x	
Peer Review-proposal																		x						
Faculty review-proposal																			x	x	x			
Peer collaboration-Project management																					x	x	x	x

Appendix C

Project Schedule

[illegible]

Appendix D

File Formatting Templates ACOG/AIM

WHAT IS AIM?

The Alliance for Innovation on Maternal Health (AIM) is a national data-driven maternal safety and quality improvement initiative. The Aim Center has a default file formatting templates available for use <https://www.acog.org/practice-management/patient-safety-and-quality/partnerships/alliance-for-innovation-on-maternal-health-aim> }.

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AIM is funded through a cooperative agreement between the American College of Obstetricians and Gynecologists (ACOG) and the Maternal and Child Health Bureau (MCHB)-Health Resource Services Administration through August 2023.

Appendix E

Competency-Based Orientation Toolkit

Purpose statement

The purpose of this CBO is to orient nurses in an inpatient obstetric unit to obstetric emergencies. This toolkit is designed to give nurses a structured, evidenced-based orientation in a safe environment allowing the skills, knowledge, and judgment to handle these infrequent but challenging high acuity events.

Audience

The toolkit is for use in the hospital in the acute obstetric setting. This CBO is intended for nurses and staff in both tertiary and community settings.

Definitions/Glossary

Maternal Sepsis – life-threatening organ dysfunction caused by a dysregulated host response to infection

ACOG – American College of Obstetricians and Gynecologists

AWHONN – Association of Women’s Health, Obstetric and Neonatal Nurses

CBO – Competency-Based Orientation

CDC – Centers for Disease Control and Prevention

CMQCC – California Maternal Quality Care Collaborative

C-section – cesarean section is surgical delivery by incision into the uterus.

EBP – evidence-based practice

EHR – electronic health record

JHNEBP – John’s Hopkins Evidence-Based Practice

OB – Obstetrics

PPH – Postpartum hemorrhage

RN – registered nurse

TJC – The Joint Commission on Accreditation of Hospitals
Virtual Simulation- vsim

Implementation Strategy

The CBO toolkit is a multifaceted toolkit that contains didactic, simulation, and competency checkoffs. This toolkit is designed to allow the implementation of EBP for orientation of nurses using the ACOG and CMQCC resources. TJC supports the use of training in OB emergencies as part of the accreditation process.

Evaluation Strategy and Tools

Alliance for Innovation on Maternal Health (AIM)-ACOG - A quality improvement initiative to support best practices that make birth safer, improve maternal health outcomes and save lives. Utilizes government grant money for the production of materials related to OB safety.

Resource	Description	Where to Find {Web Address}	Permission to Use
Obstetric In-Situ Drill Program Manual	Drill program developed to help the health care team be ready to handle and communicate effectively in OB emergencies with on-site simulation and team practice in low to high resource settings; to promote standardized responses which will improve the quality and safety of the care for patients. Provides links to safety bundles.	Practicing for Patients: In-situ Drills Manual	Yes Permission is hereby granted for duplication and distribution of this document, in its entirety and without modification, for solely non-commercial activities that are for educational, quality improvement, and patient safety purposes.
Obstetric Hemorrhage Patient Safety Bundle	A standardized, facility-wide, stage-based obstetric hemorrhage emergency management plan with checklists and escalation policy. Includes use of OB rapid response team. Preparations for at risk patients, EBP medication administration and nonpharmacological interventions. Shows respectful,	https://saferbirth.org/psbs/obstetric-hemorrhage/	Yes Obstetricians and Gynecologists. Permission is hereby granted for duplication and distribution of this document, in its entirety and without modification, for solely non-commercial activities that are for educational, quality improvement, and patient safety purposes. All other uses require written permission from ACOG.

	equitable and supportive care, includes bloodless medicine.		
Team Review and Debriefing Form: Postpartum Hemorrhage	A standardized form developed for debriefing after PPH simulation event	https://saferbirth.org/psbs/obstetric-hemorrhage/	Yes 2021 American College of Obstetricians and Gynecologists. Permission is hereby granted for duplication and distribution of this document, in its entirety and without modification, for solely non-commercial activities that are for educational, quality improvement, and patient safety purposes. All other uses require written permission from ACOG.
AIM Revised Obstetric Hemorrhage Implementation Webinar - April 2022	An educational webinar designed to improve understanding of the complexities and opportunities in the treatment of obstetric hemorrhage. Shows key themes of pph safety bundle • Review AIM program measurement strategy for HEM PSB and measurement rationale-revised	https://vimeo.com/711718789?login=true	Yes Open source webinar available on vimeo. Updated 2022.
Obstetric Hemorrhage Core Data Collection Plan Version 1.0 June 2022	Tool for monitoring outcomes and process measures related to obstetric hemorrhage outcomes, data reporting and reviews	https://saferbirth.org/psbs/obstetric-hemorrhage/	Yes Permission is hereby granted for duplication and distribution of this document, in its entirety and without modification, for solely non-commercial activities that are for educational, quality improvement, and patient safety purposes. All other uses require written permission from ACOG.
Voices of Impact: Jamie's Obstetric Hemorrhage Experience	Video of the patient experience. Designed to show impact on patient and underline need for patient safety.	https://m.facebook.com/ptsafetycouncil/videos/voices-of-impact-jamies-obstetric-hemorrhage-experience/199581070673409/	Yes Open-source video of patient experience, sponsored by AIM

Obstetric Hemorrhage Bundle Implementation Resources	Contains links to EBP materials relating to readiness, recognizing, responding, reporting, and learning with respect for patients in an equitable and supportive manner.	https://saferbirth.org/psbs/obstetric-hemorrhage/	Yes Permission is hereby granted for duplication and distribution of this document, in its entirety and without modification, for solely non-commercial activities that are for educational, quality improvement, and patient safety purposes. All other uses require written permission from ACOG.
Practicing for Patients in situ	The website has 3 usable PPH scenarios, related to uterine atony and use of a balloon tamponade, and retained products, with links to additional resources. It gives guidance for how to prepare and run drills, checklists, and debriefing questions. It also includes simulation options available with pros and cons for each type of simulator. All are contained in the drill manual guide.	https://saferbirth.org/wp-content/uploads/Hemorrhage-Case-2.pdf	Yes Permission is hereby granted for duplication and distribution of this document, in its entirety and without modification, for solely non-commercial activities that are for educational, quality improvement, and patient safety purposes. All other uses require written permission from ACOG.

Stakeholder Engagement and Communication Tools:

ACOG/AIM Resources and CMQCC Tools for Stakeholder Engagement:

Re source	Description	Where to Find {Web Address}	Permission to Use
Practicing for patients-AIM/ACOG	Two separate slide sets to engage leadership concerns and OB units concerns. Helps to obtain organizational support for PPH safety bundles	https://saferbirth.org/psbs/obstetric-hemorrhage/	Yes The toolkit is available to download after logging into CMQCC's website. If you do not already have a CMQCC Account, you will need to complete a brief survey to initialize an account.
CMQCC webinar with a slide set	Educational slide set for leadership and staff buy-in for PPH package and webinar with updated PPH toolkit data.	https://www.youtube.com/watch?v=kYhFSidLIO4	Yes The toolkit is available to download after logging into CMQCC's website. If you do not already have a CMQCC Account, you will need to complete a brief

for PPH			survey to initialize an account.
CMQCC Obstetric care guidelines for OB hemorrhage.	Contains numerous charts and checklists for PPH along with recognition cues.	https://www.cmqcc.org/resources-toolkits/toolkits/ob-hemorrhage-toolkit	Yes The toolkit is available to download after logging into CMQCC's website. If you do not already have a CMQCC Account, you will need to complete a brief survey to initialize an account.

Check Off Sheets/Competencies

Resources from CMQCC Hemorrhage toolkit	<p>Sample check-off lists and competencies</p> <p>Appendix M: Sample QBL Worksheet</p> <p>Appendix N: Techniques for Quantitative Assessment of Blood Loss (QBL)</p> <p>Appendix O: Terms and Techniques for Describing Blood Loss</p> <p>Appendix P: Sample Paper Calculators for Quantifying Blood Loss</p> <p>Appendix Q: Sample Schematic: Preadmission Planning for Women Undergoing Scheduled Cesarean Section</p> <p>Appendix R: Medications for Postpartum Hemorrhage</p> <p>Appendix S: Sample Massive Transfusion Policy – Torrance</p>	https://www.cmqcc.org/resources-toolkits/toolkits/ob-hemorrhage-toolkit	Yes The toolkit is available to download after logging into CMQCC's website. If you do not already have a CMQCC Account, you will need to complete a brief survey to initialize an account.
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Developed Simulations - Hemorrhage

CMQCC – sample useable simulations and drill for PPH	Simulations and drills sample scenarios of PPH patients with manikin and in situ scenes. Well developed with stop and start times built into the scene.	Appendix G:	Yes The toolkit is available to download after logging into CMQCC's website. If you do not already have a CMQCC Account, you will need to complete a brief survey to initialize an account. The material in this toolkit may be freely reproduced and
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			disseminated for informational, educational and non-commercial purposes only
ACOG/AIM Obstetric In-situ Drill scenarios hemorrhage	Contains additional scenarios for use on the unit. Well developed with start and stop times based on the team's response to the scenario.	https://saferbirth.org/wp-content/uploads/Hemorrhage-Case-2.pdf	Yes Permission is hereby granted for duplication and distribution of this document, in its entirety and without modification, for solely non-commercial activities that are for educational, quality improvement, and patient safety purposes. All other uses require written permission from ACOG.

Sepsis

CMQCC- Slide set for professional education	EBP slide set for professional education purposes. Last updated 2019- helps understand the Two-step method for screening sepsis, differences in VS and lab values, and treatment recommendations with a case study presentation.	https://www.cmqcc.org/resources-toolkits/toolkits/improving-diagnosis-and-treatment-maternal-sepsis-errata-712022	Yes The material in this toolkit may be freely reproduced and disseminated for informational, educational and non-commercial purposes only. The toolkit is available to download after logging into CMQCC's website
CMQCC- check off lists and competencies for sepsis	Sample checkoff lists and competencies Appendix D: Maternal Sepsis Evaluation Flow Chart Appendix E: Collecting a Urine Specimen from a Foley Catheter Appendix F: The Importance of Taking a Respiratory Rate Appendix G: How to Take an Oral Temperature Measurement Appendix H: Team Reassessment Communication	https://www.cmqcc.org/resources-toolkits/toolkits/improving-diagnosis-and-treatment-maternal-sepsis-errata-712022	Yes The material in this toolkit may be freely reproduced and disseminated for informational, educational and non-commercial purposes only. The toolkit is available to download after logging into CMQCC's website

CMQCC- Team reassessment communication tool.	Team reassessment communication tool- focuses on the communication of sepsis if criteria is met. Illustrates closed loop communication.	Appendix H: Team Reassessment Communication	Yes The material in this toolkit may be freely reproduced and disseminated for informational, educational and non-commercial purposes only. The toolkit is available to download after logging into CMQCC's website
CMQCC- Maternal sepsis drill scenario	2 scenarios with start and stop times and unfolding scenarios for sepsis patient including debriefing questions.	https://www.cmqcc.org/content/appendix-j-uc-davis-health-maternal-sepsis-drill-scenario	Yes The material in this toolkit may be freely reproduced and disseminated for informational, educational and non-commercial purposes only. The toolkit is available to download after logging into CMQCC's website
CMQCC- Sample order set	Order set from magnet facility hospital that illustrated built in order sets for use	https://www.cmqcc.org/content/appendix-m-sample-sutter-health-sepsis-order-set	Yes The material in this toolkit may be freely reproduced and disseminated for informational, educational and non-commercial purposes only. The toolkit is available to download after logging into CMQCC's website
ACOG/AIM MEWS alert system	Early warning system updated 2020- Set of specific vital sign and physical exam findings that prompt a bedside evaluation and/or work-up for patients in danger of a serious outcome	https://saferbirth.org/patient-safety-bundles/#core-aim-psbs	Yes Permission is hereby granted for duplication and distribution of this document, in its entirety and without modification, for solely non-commercial activities that are for educational, quality

			improvement, and patient safety purposes. All other uses require written permission from ACOG.
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Appendix F
Scenario Package AIM/ACOG
[Website](#)

Sample OB hemorrhage scenarios and debriefing forms were developed by ACOG, with support from HRSA, and HHS, utilizing grant money. All scenarios are available for use in their entirety without modification for educational, quality improvement, and patient safety purposes. The actual permission is found on the website and throughout the training materials. These resources can be found in the OB in-situ training manual with hyperlinks.

Example PPH Scenario



Case 1: Postpartum Hemorrhage Secondary to Uterine Atony

Learning Objectives:

By the end of this scenario, each care team member should be able to successfully do the following:

- Recognize risk factors for postpartum hemorrhage.
- Identify postpartum hemorrhage due to uterine atony and be able to treat with appropriate medical management.
- Demonstrate teamwork and communication skills during a simulated postpartum hemorrhage.

Planned Completion Points:

To successfully complete this scenario, the care team should successfully do the following:

- Recognize uterine atony as the etiology for postpartum hemorrhage.
- Perform uterine massage.
- Administer two different uterotonic medications.
- Call for blood (e.g., 2 units of PRBCs).

OR

- If 10 minutes has elapsed after recognition of hemorrhage and the team has not corrected the hemorrhage or called for blood.

Expected Duration

Approximately 60 minutes (30 minutes for simulation / 30 minutes for debriefing).

Case Scenario

► **Patient: Marla Smith**

Mrs. Marla Smith is a 38-year-old G3P2012 who was admitted in active labor at 39+3 weeks and had a spontaneous vaginal delivery 30 minutes ago. Her delivery was uncomplicated. She had a first-degree laceration that did not require repair. She is approximately 30 minutes postpartum and has just called out because she feels dizzy and has more bleeding.

► **Patient Information:**

- She has no significant past medical history.
- She has no known drug allergies.
- Her pregnancy was uncomplicated except for an elevated 1-hour glucose screen with a normal 3- hour glucose tolerance test.

► **Laboratory Data (On Admission):**

- Hemoglobin: 12.2
- Hematocrit: 36.6
- WBC: 12,000
- Platelets: 218,000

► **Delivery Information:**

- **Measurement of cumulative blood loss (as quantitative as possible)** from the delivery was 300cc.
- The placenta was inspected at the time of delivery and appeared to be intact per the delivery note.
- There was only a first-degree laceration that did not require repair.
- The infant weighed 4120 grams.
- The patient has an IV line in place with oxytocin running.

► **Family Member/Patient Instructions:**

- **Standardized Patient:** If a person is playing the role of the patient during the scenario, she should emphasize that this is much more bleeding than the last delivery. As the bleeding continues the patient can also state that she is feeling faint and dizzy.
- **Family Member/Friend:** If someone plays the role of the patient's family member or friend, he or she may be the patient's partner, mom, other relative, or friend. This person should continue to ask questions during the scenario including things like, "Why is she bleeding so much?" or "She looks like she is kind of pale."

As the patient's vital signs continue to decline, this person should occasionally ask, "Is she going to die?" This person should be anxious with any mention of going to the OR and asks for clarification as to why that is necessary. This person should continue to voice that the patient wants to have more children and should initially refuse to, but reluctantly, leave the patient's bedside when/if asked to.

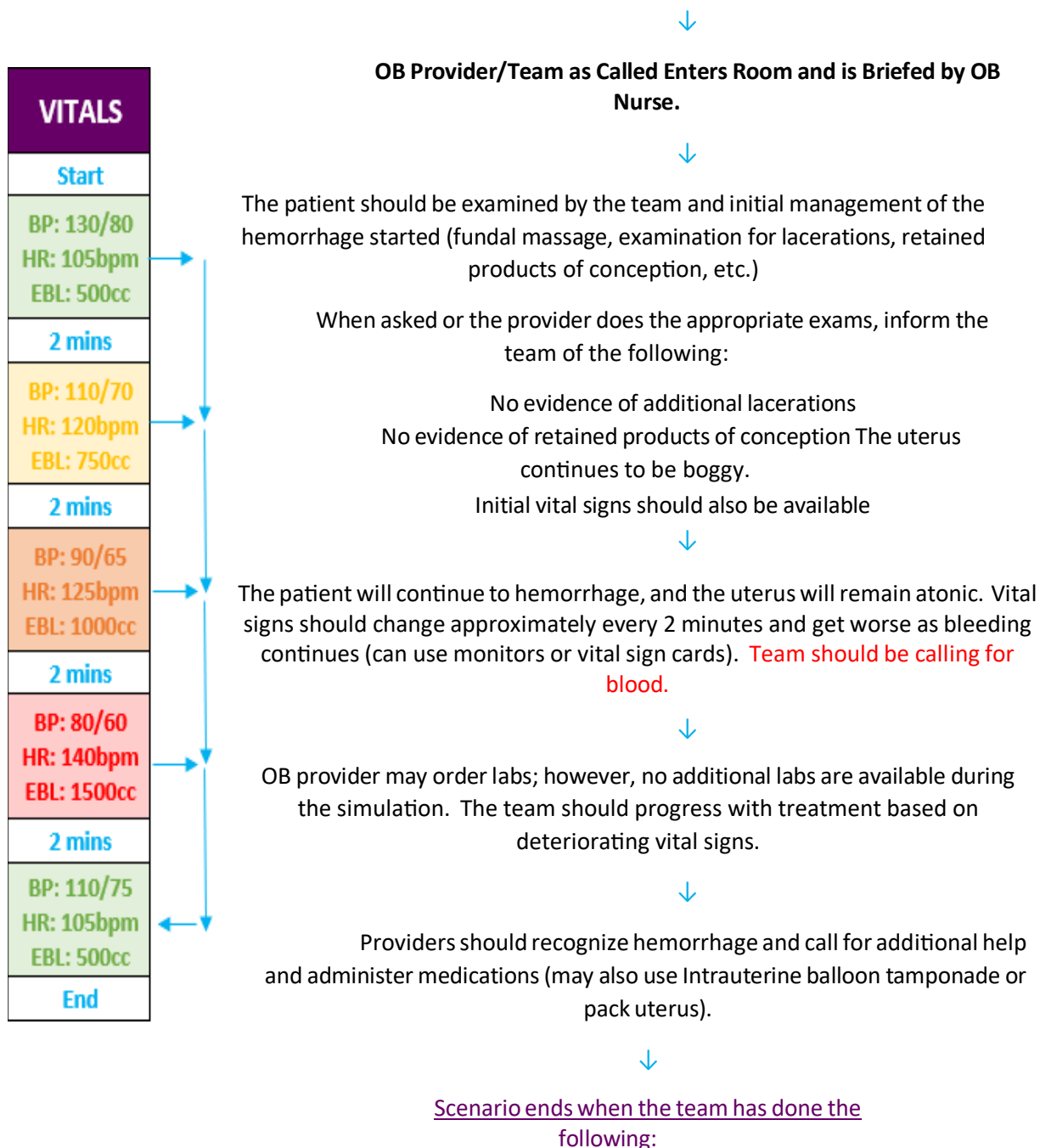
Answers to Common Questions for this Scenario:

- The patient does not have a history of asthma or hypertension in this case.

- The patient does not have any known allergies to medications.
- If asked additional questions, try to redirect and not answer specifics so as not to introduce things that might complicate the scenario (i.e. don't say that she has a relative with an unknown bleeding disorder).

Case 1: Case Flow/Algorithm with Branch Point and Completion Criteria

Simulation facilitator will introduce the scenario to the team outside the room and then bring OB Nurse to the patient's room to review the patient scenario. The OB Nurse should then enter the room, assess the patient, and then call for assistance.



Performed Uterine massage

Examined for lacerations

Evaluated for retained products of conception

Administered two medications to correct uterine atony (correct dose and route) Called for blood

OR

The team fails to correct the hemorrhage within 10 minutes or fails to call for blood.

Sample Debriefing form:

Team Review and Debriefing Form: Postpartum Hemorrhage

READINESS

	Yes/No	Opportunity for Improvement
Hemorrhage cart stocked with all needed supplies		
Hemorrhage medications immediately available		
Emergency response team established		
Massive transfusion protocol available		
Emergency blood release protocol available		

RECOGNITION & PREVENTION

Review risk factors for hemorrhage in this patient: (list factors)

RESPONSE

ASSESSMENT/ACTION	EVALUATION				
	Done	Not Done	Improvement Opportunity	N/A for Scenario	Notes
Provider/Team recognizes PPH in timely manner					
Team calls for hemorrhage cart					
Provider/Team calls for additional assistance					
Team inspects for lacerations					
Provider checks for retained products of conception					
Team diagnoses etiology of hemorrhage accurately					
Team administers uterotonics					
Team communicates about ongoing blood loss					
Team places second IV					
Team orders labs (CBC/PR/PTT)					
Team considers placements of Foley catheter to monitor urine output					
Team considers administering TXA					
Team places uterine balloon or uterine packing					
Team recognizes need for operative management of PPH in timely manner					
Team counsels the patient/family on the need					

for operative management, including potential need for hysterectomy					
Team considers transfer to other facility					

Additional notes/summarize and review any lessons learned:

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

TEAM REVIEW AND DEBRIEFING NOTES

Common medications for postpartum hemorrhage (including contraindications)

MEDICATION	DOSE	CONTRAINDICATIONS
Oxytocin	10-40 units per 500-1000mL as continuous infusion or 1M 10 units	Hypersensitivity to oxytocin (rare)
Methylergonovine (Methergine)	0.2mg 1M OR into myometrium Q2-4 hours	Hypertension, preeclampsia, asthma, Raynaud's syndrome
Prostaglandin F-2 alpha (Hemabate)	250 mcg 1M OR into myometrium Q 15 minutes (up to 8 doses)	Asthma, renal disorders, pulmonary hypertension
Misoprostol (Cytotec, PGE-1)	600 mcg – 1,000 mcg oral, per rectum -or- sublingual x 1 dose	Known hypersensitivity to NSAIDs, active GI bleeding
Tranexamic acid (TXA)	1 gram IV over 10 minutes, 2nd dose can be given if continued bleeding w/in 24hrs	Subarachnoid hemorrhage, acute intravascular clotting, hypersensitivity to TXA

- Emphasize that treatment of the patient is directed by symptoms and vital signs and should not be delayed while waiting for laboratory values.
- Additional treatment options: i.e., intrauterine balloon tamponade/ uterine packing should be pursued if initial interventions failed.
- Review transfusion management and local massive transfusion protocols.
- If medical management is not successful, then operative management should be pursued.
- It is important to counsel and keep the patient and family informed during the hemorrhage.

© 2021 American College of Obstetricians and Gynecologists. Permission is hereby granted for duplication and distribution of this document, in its entirety and without modification, for solely non-commercial activities that are for educational, quality improvement, and patient safety purposes. All other uses require written permission from ACOG. Standardization of health care processes and reduced variation has been shown to improve outcomes and quality of care. The Council on Patient Safety in Women's Health Care disseminates patient safety tools to help facilitate the standardization process. This tool reflects emerging clinical, scientific, and patient safety advances as of the date issued and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed. Although the components of a particular tool may be adapted to local resources, standardization within an institution is strongly encouraged.

The Council on Patient Safety in Women's Health Care is a broad consortium of organizations across the spectrum of women's health for the promotion of safe health care for every woman. March 2021

For more information visit the Council's website at
www.safehealthcareforeverywoman.org

Appendix G
Talking Points ACOG/AIM
LEADERSHIP

In-Situ Simulation Program for Obstetric Emergencies



Slide 1

Overview

- Obstetric emergencies require a multidisciplinary team approach for optimal outcomes
- In-Situ simulation can improve teamwork and performance and identify facilities/system issues before patients are negatively affected
- The Council on Patient Safety in Women's Health Care has created a national multidisciplinary program to help hospitals run in-situ simulations for common obstetric emergencies



Slide 2

Outline

- Why is in-situ simulation needed in Obstetrics?
- The Practicing for Patients program
- What is needed to implement the program?

Slide 3



Why do In-Situ Simulation?

- Maternal morbidity and mortality in the United States continue to increase
- Teamwork and communication errors are common reasons for poor outcomes and not taught well by lectures
- Simulations on the delivery unit can identify facilities and systems issues before they cause problems in real life

If Americans Love Moms,
Why Do We Let Them Die?



"An American woman is about five times as likely to die in pregnancy or childbirth as a British woman"

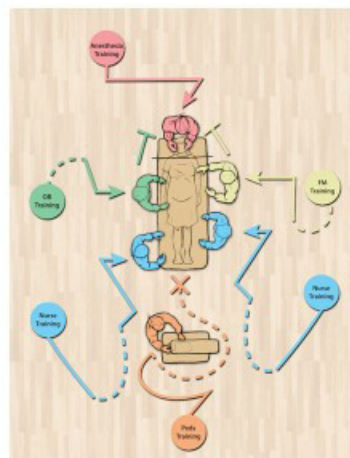
- NY Times, July 29, 2017

Slide 4



Current Status

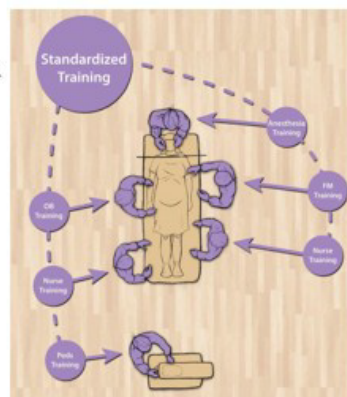
- It takes a team to care for patients on labor and delivery
- Members of the team are trained differently
- The basic concepts of care are the same, but the approaches are often different
- The team is expected to come together and perform well even if they have not had time to “practice” together



Slide 5

In-Situ Obstetric Simulation Training

- Allows actual teams to train together and practice clinical skills as well as communication and teamwork
- Permits hospitals to practice and refine their protocols
- Identifies systems/facilities issues
- Tests new wards / protocols



Slide 6

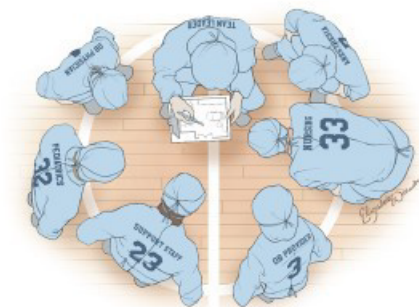
Current Challenges with In-Situ Programs

- There may not be expertise at the local level to create the simulations
- Concerns about cost of simulators and equipment
- Potential for interruption of patient care or reluctance of providers to participate
- Challenge to keep simulations and recommendations current with changing clinical practice standards

Slide 7



Practicing for Patients



The Council on Patient Safety in Women's Health Care has created the Practicing for Patients program in order to provide every hospital the tools they need to implement In-Situ simulation training for obstetric emergencies



Slide 8

Program Components

1. Comprehensive Instruction Manual
 - Preparation and scheduling
 - Simulator options
 - Team debriefing and review forms
 - Video examples of simulations/ debriefing
2. Simulation Scenarios and Resources
 - Postpartum Hemorrhage
 - Severe Hypertension



Slide 9

Leadership Support Needed to Implement Practicing for Patients

- Visible leadership support
- Funding for simulation equipment
- Designated point of contact on the labor and delivery unit
- Buy-in from the labor and delivery care team

Slide 10



Summary

- Practicing as a team for obstetric emergencies is critical to ensure optimal outcomes
- The Practicing for Patients program will allow our institution to be ready and keep our patients safe
- We appreciate your consideration and ask for your support to implement this program



Slide 11



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