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Interdisciplinary Collaboration to Maintain a Culture of Safety in a Labor and Delivery Setting

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ABSTRACT

A culture of safety is a growing movement in obstetrical healthcare quality and management. Patient-centered and safe care is a primary priority for all healthcare workers, with communication and teamwork central to achieving optimal maternal health outcomes. A mandatory educational program was developed and implemented by physicians and nurses to sustain awareness and compliance to current protocols within a large university-based hospital. A didactic portion reviewing shoulder dystocia, operative vaginal delivery, obstetric hemorrhage, and fetal monitoring escalation was combined with a simulation session. The simulation was a fetal bradycardia activating the decision to perform an operative vaginal delivery complicated by a shoulder dystocia. More than 370 members of the healthcare team participated including obstetricians, midwives, the anesthesia team, and nurses. Success of the program was measured by an evaluation tool and comparing results from a prior safety questionnaire. Ninety-seven percent rated the program as excellent, and the response to a question on perception of overall grade on patient safety measured by the Agency for Healthcare Research and Quality safety survey demonstrated a significant improvement in the score ($P = .003$) following the program.

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Patient safety is a critical component of healthcare quality. As healthcare organizations continually strive to improve, there is a growing recognition of the importance of establishing a culture of safety. Achieving a culture of safety requires an understanding of the values, beliefs, and norms about what is important in an organization and what attitudes and behaviors related to patient safety are expected and appropriate. The Agency for Healthcare Research and Quality describes a safety culture as the product of individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization's health and safety management.[1] Perinatal professional societies, in a joint call to action statement, agreed that patient-centered and safe care of the mother and the infant enhances quality and is a primary priority.[2] In this joint statement, effective communication and teamwork are cited as components necessary to achieve optimal maternal health outcomes.[2]

REVIEW OF THE LITERATURE

Obstetric emergencies are unpredictable and sudden and can present in otherwise healthy, low-risk women at term.[3,4] Clinical teams must respond to such emergencies in a confident, competent, and efficient manner. A rapid coordinated response, clear communication, and teamwork are vital for these ad hoc teams assembled during crucial situations.[4] Communication failures and lack of teamwork are major contributors to maternal and perinatal morbidity and associated with as many as one-third of closed obstetric malpractice

cases.[5,6] While not all obstetric adverse events are preventable, the majority do seem to have a preventable cause, with poor teamwork and poor communication often central to the event.[7]

Strategies to promoting safer and high-quality care for women and infants include administrative support, effective clinical leadership, and varied approaches.[8] One approach to advance a safety culture is through implementation of protocols for current issues in perinatal patient safety such as titration of oxytocin for induction, operative vaginal delivery (OVD), electronic fetal monitoring, obstetric hemorrhage, and shoulder dystocia.[8] Protocol development is a clinical strategy that assists in improving communication and guiding practice based on available evidence, whereas standardization of processes can result in improved quality.[9] Another approach to improving teamwork and communication is proficiency-based training and simulation that result in durable skills.[10–13] Multidisciplinary simulation exercises provide an opportunity for practicing effective collaboration and can lead to a safe and healthy work environment.[8,14] Simulation-based training allows the multidisciplinary team to respond to a contrived patient situation embedded with realistic cues. It is used in many industries to improve communication and other teamwork behaviors.[15] Regardless of the use of a low-fidelity (not very realistic) or training on a high-fidelity (realistic) mannequin, simulation training has been associated with an improvement in posttraining versus pretraining evaluation (94.7% vs 81.4%, $P = .002$), including communication with the patient (83.3% vs 42.9%, $P < .001$), in a shoulder dystocia exercise.[16] While it is not known the frequency to which teams should assemble to maintain competency and provide high-quality care, perinatal team training is well received and provides the milieu for effective communication, mutual performance, and support, scrutinize organizational culture, and provide a safe atmosphere to discuss and clarify deviance from protocols. Simulation is an effective means to maintain infrequently used clinical skills, expose opportunities for protocol clarification, and address hidden threats within the labor and delivery unit.[3]

Following any protocol introduction, continued challenges emerge include sustaining what is learned and implementing simulation-based courses for new team members to prevent dilution of the pool of trained personnel. *Skill decay* refers to the diminution of skills or knowledge after periods of nonuse influenced by the factors of retention, task characteristics (eg, physical vs cognitive tasks), methods of original learning, and individual differences.[17] The authors of a meta-analysis of these factors estimated that after more than 1 year without practicing, the average participants would perform at less than 92% of their performance level before the interval began.[17] One systematic review of team performance concluded that the ability to retrieve and use knowledge and skills is impaired during acute care events.[18] While the frequency of titration of oxytocin, blood loss estimation, and communication of fetal heart rate interpretation is a daily occurrence for most labor and delivery practitioners, feedback on the actual task is not; therefore, skill decay might occur. The frequency of a shoulder dystocia, postpartum hemorrhage, and OVD occurrence is less often and the team assembled during these events is varied. Skill decay in individual versus team tasks is an issue worthy of future research.[17]

PURPOSE

Process standardization through protocol development and team training is integral to the achievement of a safe work environment, improving communication and protecting the patient from hazards and harm. A program was developed, titled "Maintaining the Culture of Safety," that implied that numerous protocols had been implemented and that this was a sustainability endeavor due to potential decay of awareness over time. The program was developed to align the multidisciplinary team to perform in an expert manner while understanding that the team itself is comprised of personnel with varied levels of expertise. Therefore, understanding expectations, outlined by written protocols supported by available evidence, improves the outcome for the woman and her fetus regardless of the ad hoc team assembled for any particular emergency. Continued attention to protocol compliance by quality indicator monitoring is central to a continuation and maintenance of a safety culture.

BACKGROUND

Many obstetric protocols were developed and implemented over a 5-year period at this university-based medical center with more than 12 000 annual births. Although all providers and nurses are oriented to each protocol upon implementation and/or during orientation, it cannot be assumed that all share a common perception of protocol components. Thus, the possibility of inconsistency of protocol compliance and revertible practice patterns may exist. Intended behavioral deviance and rejection of established protocols may allow for variant practice to persist. Unfortunately, employees often fail to "speak up" when they observe risky, noncompliant behaviors even when they know they should. The Safety Culture Survey administered to hundreds of organizations by Safety Performance Solutions Inc indicates that 90% of respondents believe that

employees should caution others when they are operating at-risk.[1] However, only 60% say they actually do provide this critical feedback.[1]

Given the importance for stakeholders to have a shared mental model of protocols and guidelines, an organizational leadership decision promoted development of a program with goals to improve collaboration, review key protocols, clarify misconceptions, and provide a framework for dissemination of outcomes. Shoulder dystocia, obstetric hemorrhage, fetal monitoring, and OVD were selected as the key protocols that required multidisciplinary communication and teamwork review because of the high-risk implications they present.

Engaging stakeholders in development

Prior to content development, obstetricians, midwives, and nurses were queried to identify barriers and concerns with the current protocols so that program content would be meaningful and pertinent to current practice. Both nurses and providers overwhelmingly voiced agreement that a refresher course would be of value as seen in Figure 1. The needs of the participants must be recognized so that content specific to areas of greatest demand are developed and gaps identified between written protocols and current performance. In addition, data obtained from quality measures assisted in defining performance opportunities within the current evidence-based protocols.

The obstetric department chair requested both faculty and private practice physicians to join nursing leaders and participate in a facilitation team charged with the responsibility to develop and present the educational sessions to all members of the labor and delivery department. Integral to the context was the multidisciplinary presentation format depicting the essence of teamwork and communication. Representatives from all disciplines who respond clinically to obstetric emergencies worked together to develop the educational format and simulation plan. Although this process was time-consuming, it promoted collegiality, increased buy-in from the specialties, identified potential problems, and created a unified bond within the facilitation team.

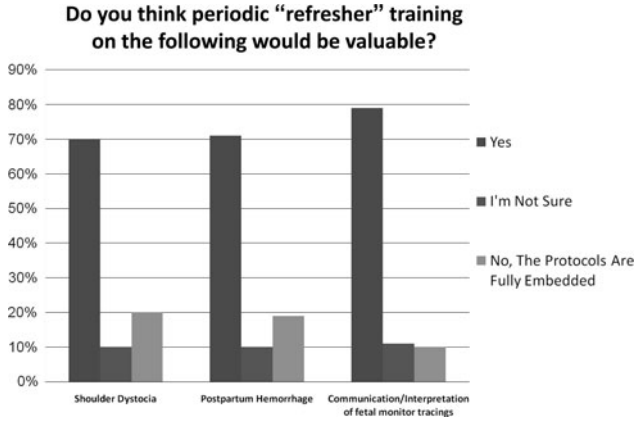


Figure 1. Needs assessment of participants.

Train the trainer

The program was designed to flow from a didactic presentation encouraging discussion to a simulation session. The didactic presentation reviewed each protocol and identified opportunities for improvement and current outcomes since implementation. Each protocol was reviewed initially with the facilitation team for consistency in understanding. The intent was to minimize the didactic component and focus on discussion and simulation. Training sessions for the facilitation team were held to establish consistency in content presentation. Time for discussion and clarification of fundamental elements in each protocol was key so that all presenters had a clear understanding of the script and scenario for simulation.

Organized approach to didactic and simulation session

It is crucial for program development and implementation to use an organized approach, with clear expectations communicated to all participants. Multidisciplinary sessions occurred during a 3-month time period and involved 372 people (110 physicians, 48 residents, 22 midwives, 178 nurses, and 14 attending anesthesiologists). All individuals were mandated to participate in the 2-hour session. Five sessions were held each week over 10 weeks, for a total of 50 sessions. Each session was cofacilitated by a nurse and a physician from the facilitation team, and session attendees consisted of a blend of obstetric providers and nurses with a minimum of 5 participants to a maximum of 10 participants. All participants were given ample time to register for the session.

Nurses were paid for their 2-hour attendance requirement, leading to an approximate cost of $6300. This was an extra requirement for nurses and one where they could not stay beyond their 12-hour shift, nor accrue overtime as not to contribute to worker fatigue. Ten obstetricians were members of the facilitation team and were paid for presenting the program (50 sessions, each 2 hours, for a total of 100 hours) approximately $12 000. Physicians and midwives attending the program were not paid for their participation. It can be difficult to calculate the cost of programs such as this and the return on this investment by the hospital. However, tracking metrics of improved patient outcome due

to protocol compliance has great value. To be successful in improving outcomes and sustaining a culture of safety, multiple strategies must be used to support best practice.[8]

All sessions were held in one of the patient rooms in the labor and delivery department. One part of the room was set aside for the didactic/discussion portion so that participants could be seated, easily view the slide presentation, and participate in the discussion. A "parking lot" for unresolved issues was initiated during the sessions, with a promise to respond to concerns that could not be answered during the current session. The "parking lot" was very helpful in demonstrating that all participants' needs and concerns were heard and recorded without taking valuable time away from the simulation component.

Once the didactic portion was completed, chairs were moved aside and the room was returned into a birthing suite. While the room transformation was occurring; each participant estimated blood volume on 5 common obstetrical products containing varied amounts of simulated blood. Upon completion of the blood volume exercise, participants returned to the labor bed where a low-fidelity pelvic simulation model, *The MODEL-med Sophie and her Mum Full Birth Obstetric Trainer*, had been placed. The simulation model was used for a scenario of a previously recorded fetal bradycardia resulting in a decision to perform an OVD that was then complicated by a shoulder dystocia. The simulation was designed to have face validity across the range of professionals participating and designed with complexity and appropriate difficulty for each role. Using real-life clinical events to develop simulation scenarios facilitates the application of directly relevant clinical skills.[13] During the session, physicians used either forceps or vacuum depending on their preference. If the provider was a certified nurse midwife, the OVD section was omitted. Participants rotated in the role as a designated recorder to document, through the use of a checklist, whether all components of the protocols were seen or verbalized.

Immediately following each simulation, a debriefing session occurred. Debriefing is an essential part of simulation training to review key concepts, identify barriers to protocol utilization, discuss team performance, and verbalize thoughts and opinions.[7,19] Time dedicated to this conversation about the simulated event allowed the participants to analyze and synthesize actions and thought processes and any emotional response or experiences from past events. Each debriefing session was grounded with openness, honesty, respect, and confidentiality. Facilitators were directed to create a caring, learning environment that was supportive and not critical of a performance. The added investment of videotaping has been noted as a powerful tool that adds value to learning.[19] This program was not videotaped because of the added expense; however, each session used a designated recorder from the multidisciplinary group charged with noting teamwork skills and communication barriers. The debriefing session usually lasted much longer than the actual simulation. Following the session, each participant completed an evaluation form to solicit feedback on the entire program.

PROTOCOLS REVIEWED DURING THE SESSIONS

Protocol 1: Shoulder dystocia

Shoulder dystocia is an unpredictable unexpected obstetric emergency, associated with maternal and fetal adverse outcomes, where the shoulders are impacted behind the pubic bone during a cephalic vaginal delivery.[20] The low prevalence and varied team members are factors that complicate team performance.[21] The shoulder dystocia protocol noted in Figure 2 was the first multidisciplinary protocol developed as a quality improvement initiative designed to enhance teamwork, communication, and documentation. Prior to protocol implementation, complete and consistent documentation was present in approximately 10% of reviewed records. The protocol is initiated when the delivery provider clearly announces "I have a shoulder dystocia," which triggers an nurse response to call for emergency assistance by pressing one button alerting the unit attending obstetrician, an anesthesia provider, a third nurse, the obstetric resident, and the neonatal team. A step stool is positioned in anticipation of suprapubic pressure, and the time since delivery of the head is called out in 30-second intervals. With every delivery, the event marker is pressed on the fetal monitor as the head is delivered. This uniform practice was implemented because the event of a shoulder dystocia is unpredictable, and consequently, the head-to-body interval is available with every birth. The nurse replaces the family member in supporting the mother's leg in anticipation of McRobert's maneuver, whereas a second nurse is positioned for the possibility of suprapubic pressure. All maneuvers are performed at the request of the delivery provider. Following the delivery, a safety huddle convenes to discuss the emergency and review elements recorded on the shoulder dystocia worksheet. This worksheet is used as a reference tool for documentation in the electronic medical record. The provider documents duration, maneuvers, and position of the fetal head at restitution, and the nurse documents members of the responding team. Together, these

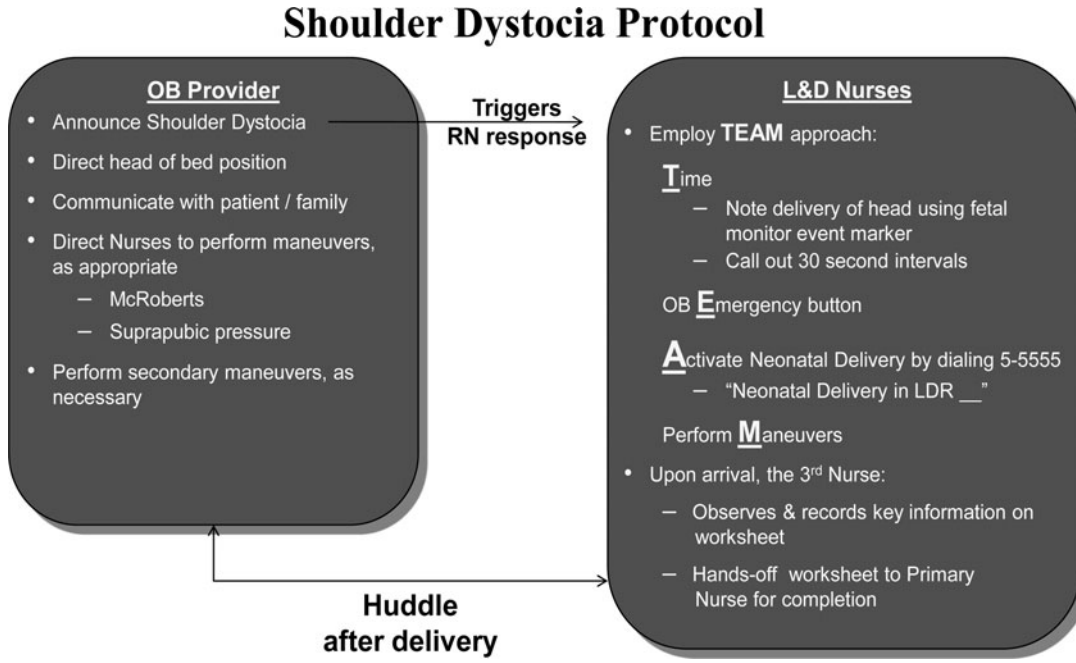


Figure 2. Shoulder dystocia protocol. OB indicates obstetrics; L&D, labor and delivery; LDR, L&D, labor and delivery room.

entries provide a complete and accurate recording of the event.

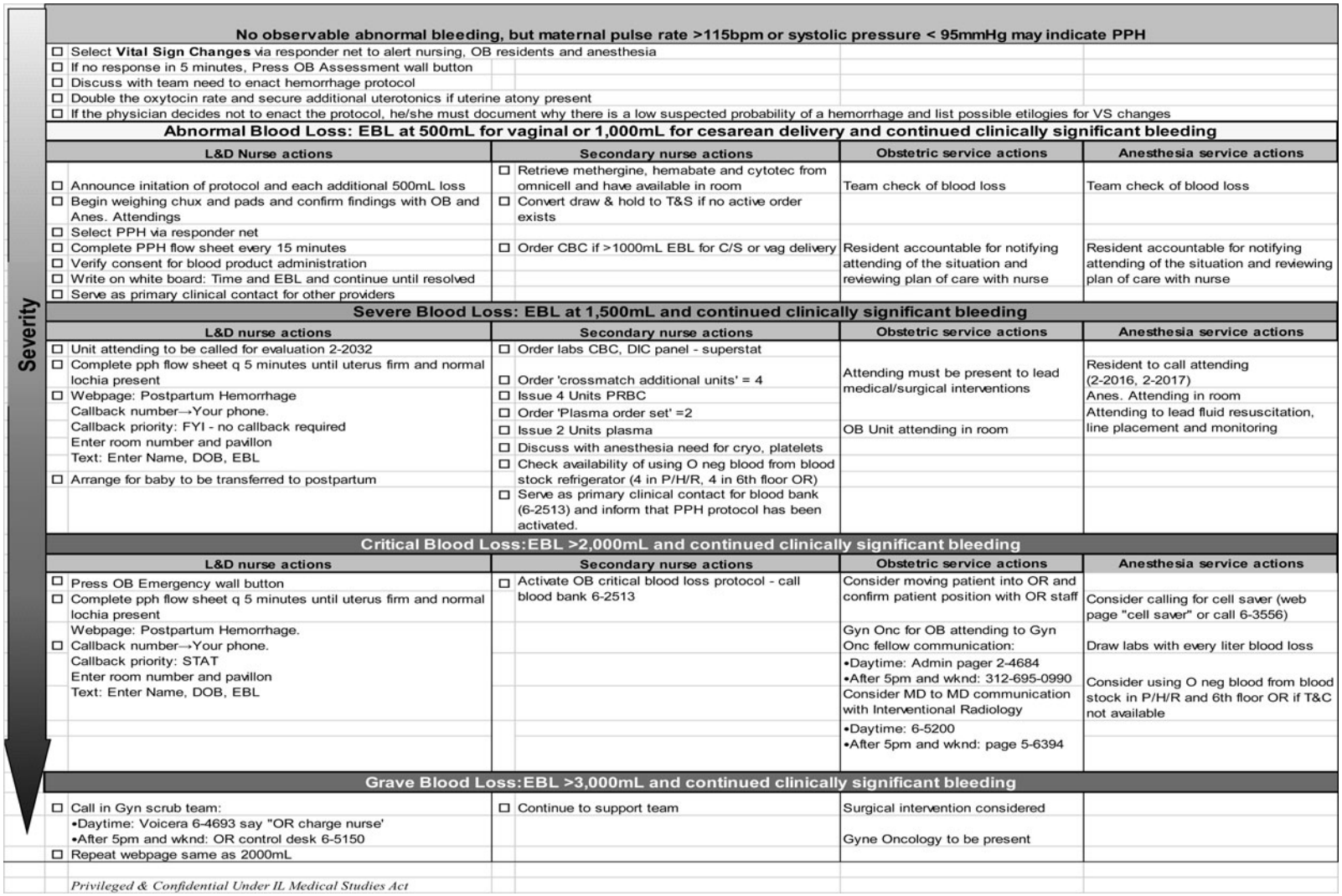
Outcomes since implementation of the shoulder dystocia response protocol have included complete and consistent documentation sustained at nearly 100%, up from a baseline of 10% and a continued reduction of more than 60% of brachial plexus injury over the past 5 years. This improved outcome is consistent with other reported outcomes.[16,21–23]

During the "Culture of Safety" program, all elements of the protocol were reviewed, the purpose of the worksheet was reiterated, and each participant had the opportunity to perform and debrief a shoulder dystocia drill.

Protocol 2: Obstetric hemorrhage

Obstetric hemorrhage is a leading cause of maternal morbidity and mortality.[24] Illinois expanded from the lead of other states in developing a collaborative educational program with the primary aim to improve early identification, response, and management of obstetric hemorrhage in an effort to reduce maternal morbidity and mortality. The Obstetric Hemorrhage Education Project was mandated in 2009 to all birthing hospitals in Illinois and emphasized a multidisciplinary approach to education and simulation drills.[25] The initial roll-out of the program required a mandatory 4-hour educational program developed by the Illinois Department of Public Health Obstetric Hemorrhage task force. The program included 4 components: (1) a didactic lecture; (2) blood volume estimation exercise; (3) pre-/posttest; and (4) multidisciplinary simulation exercise. Blood volume is typically underestimated when there is a large amount of blood lost and overestimated when there is a small amount of blood lost.[26–28] Weighing the underpads, pads, towels, etc, may give an estimate of the amount of blood volume lost. Measuring the amount in the suction canister and estimating volume on the bed or operating table linens and drapes and blood on the floor also assist in quantifying total blood loss.

A protocol for obstetric hemorrhage was developed prior to the start of the state's initiative. The obstetric hemorrhage protocol shown in Figure 3 is a guide for the multidisciplinary team to provide a trigger for additional notifications and orders. Compliance to the protocol is monitored via medical record review, and outcomes are assessed by the blood transfusion rate. Activation of the obstetric hemorrhage protocol may be initiated by any member of the team and does not require a physician order to begin. The protocol is initiated when vital sign changes become apparent and/or there is a perceived loss of more than 500 mL of blood with a vaginal delivery or more than 1000 mL of blood with a cesarean birth. Adjunctive to the obstetric hemorrhage protocol, a risk-based protocol was implemented to assist in anticipatory preparation of women for delivery, with a particularly high risk of hemorrhage (eg, those with suspected abnormal placentation).



No observable abnormal bleeding, but maternal pulse rate >115bpm or systolic pressure < 95mmHg may indicate PPH

- ☐ Select **Vital Sign Changes** via responder net to alert nursing, OB residents and anesthesia
- ☐ If no response in 5 minutes, Press OB Assessment wall button
- ☐ Discuss with team need to enact hemorrhage protocol
- ☐ Double the oxytocin rate and secure additional uterotonics if uterine atony present
- ☐ If the physician decides not to enact the protocol, he/she must document why there is a low suspected probability of a hemorrhage and list possible etiologies for VS changes

Abnormal Blood Loss: EBL at 500mL for vaginal or 1,000mL for cesarean delivery and continued clinically significant bleeding

L&D Nurse actions	Secondary nurse actions	Obstetric service actions	Anesthesia service actions
☐ Announce initation of protocol and each additional 500mL loss	☐ Retrieve methergine, hemabate and cytotec from omnicell and have available in room	Team check of blood loss	Team check of blood loss
☐ Begin weighing chux and pads and confirm findings with OB and Anes. Attendings	☐ Convert draw & hold to T&S if no active order exists		
☐ Select PPH via responder net			
☐ Complete PPH flow sheet every 15 minutes	☐ Order CBC if >1000mL EBL for C/S or vag delivery	Resident accountable for notifying attending of the situation and reviewing plan of care with nurse	Resident accountable for notifying attending of the situation and reviewing plan of care with nurse
☐ Verify consent for blood product administration			
☐ Write on white board: Time and EBL and continue until resolved			
☐ Serve as primary clinical contact for other providers			

Severe Blood Loss: EBL at 1,500mL and continued clinically significant bleeding

L&D nurse actions	Secondary nurse actions	Obstetric service actions	Anesthesia service actions
☐ Unit attending to be called for evaluation 2-2032	☐ Order labs CBC, DIC panel - superstat	Attending must be present to lead medical/surgical interventions	Resident to call attending (2-2016, 2-2017)
☐ Complete pph flow sheet q 5 minutes until uterus firm and normal lochia present	☐ Order 'crossmatch additional units' = 4		Anes. Attending in room
☐ Webpage: Postpartum Hemorrhage	☐ Issue 4 Units PRBC		Attending to lead fluid resuscitation, line placement and monitoring
Callback number→Your phone.	☐ Order 'Plasma order set' =2		
Callback priority: FYI - no callback required	☐ Issue 2 Units plasma	OB Unit attending in room	
Enter room number and pavillon	☐ Discuss with anesthesia need for cryo, platelets		
Text: Enter Name, DOB, EBL	☐ Check availability of using O neg blood from blood stock refrigerator (4 in P/H/R, 4 in 6th floor OR)		
☐ Arrange for baby to be transferred to postpartum	☐ Serve as primary clinical contact for blood bank (6-2513) and inform that PPH protocol has been activated.		

Critical Blood Loss:EBL >2,000mL and continued clinically significant bleeding

L&D nurse actions	Secondary nurse actions	Obstetric service actions	Anesthesia service actions
☐ Press OB Emergency wall button	☐ Activate OB critical blood loss protocol - call blood bank 6-2513	Consider moving patient into OR and confirm patient position with OR staff	
☐ Complete pph flow sheet q 5 minutes until uterus firm and normal lochia present			Consider calling for cell saver (web page "cell saver" or call 6-3556)
Webpage: Postpartum Hemorrhage.		Gyn Onc for OB attending to Gyn Onc fellow communication:	
☐ Callback number→Your phone.			Draw labs with every liter blood loss
Callback priority: STAT		•Daytime: Admin pager 2-4684	
Enter room number and pavillon		•After 5pm and wknd: 312-695-0990	Consider using O neg blood from blood stock in P/H/R and 6th floor OR if T&C not available
Text: Enter Name, DOB, EBL		Consider MD to MD communication with Interventional Radiology	
		•Daytime: 6-5200	
		•After 5pm and wknd: page 5-6394	

Grave Blood Loss:EBL >3,000mL and continued clinically significant bleeding

☐ Call in Gyn scrub team:	☐ Continue to support team	Surgical intervention considered	
•Daytime: Voicera 6-4693 say "OR charge nurse"			
•After 5pm and wknd: OR control desk 6-5150		Gyne Oncology to be present	
☐ Repeat webpage same as 2000mL			

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Figure 3. Obstetric postpartum hemorrhage protocol. PPH indicates postpartum hemorrhage; P/H/R, prep/hold/recovery; T&S, type and screen; C/S, cesarean section; OB, obstetrics; EBL, estimated blood loss.

In preparation for the Culture of Safety program, the facilitation team determined that a blood-volume estimation exercise would be helpful. Five common objects, underbuttock drape (1000 mL), 5 tail sponges (100 mL total), lap sponge (100 mL), underpad (250 mL), and peripad (250 mL), were displayed with varying amounts of synthetic blood, as noted in parenthesis, poured onto them. As expected, the majority of participants in the sessions underestimated the amount in the underbuttock drape. Second, the underpad and peripad, which together made up 500 mL—an amount considered to be hemorrhage in a vaginal delivery, was also underestimated. Greatest accuracy of estimation was with the lap sponges. The "Culture of Safety" program provided the opportunity to review the obstetric hemorrhage protocol with all participants. Discussion revealed the need to clarify various elements, including triggers for interventional radiology notification and blood bank procedure with massive blood replacement needs. Two changes to the protocol were made after the program as a direct result from multidisciplinary discussion. These changes were for cryoprecipitate added at the discretion of the anesthesia provider and automatic provision of a second nurse to support the primary nurse during protocol initiation.

Protocol 3: Fetal monitoring escalation

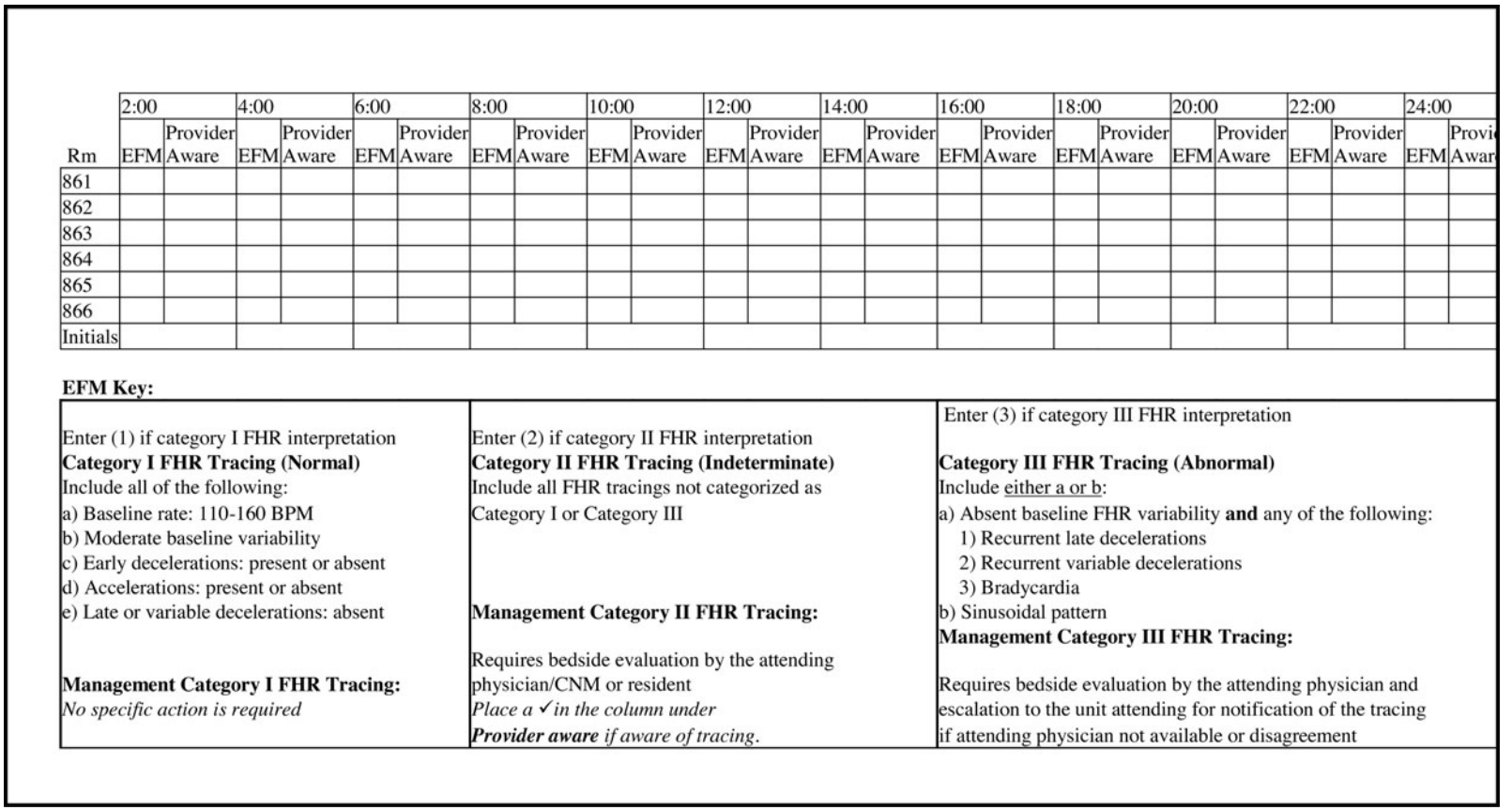
Fetal monitoring remains a cultural phenomenon and a virtual "standard" of intrapartum care for American women.[29] An update to fetal monitoring terminology was published in 2008, introducing categorization of tracing interpretation.[30,31] In response to that publication, the obstetric department held joint physician/nursing education forums where nomenclature was reviewed and selected fetal monitoring strips were interpreted first individually and then by group consensus. Following that education session, a multidisciplinary team developed a protocol for provider notification by the nurse in the presence of a category 2 and 3 tracing. From a patient safety perspective, an interprofessional training program helps standardize and increase knowledge, skills, and attitudes for interpretation and management of electronic fetal heart rate monitoring patterns.[32] Interpretation of uterine activity, baseline, variability, and decelerations are required components of routine communication, whereas the categories are used as a trigger for notification and escalation. A quality surveillance tool shown in Figure 4 is completed every 2 hours by a labor and delivery senior nurse who assigns the category 1, 2, or 3 upon strip review. This is in addition to the regular routine evaluation performed by the bedside nurse. This additional supervision triggers a validation question to the bedside nurse for verification of provider notification and assurance of a management plan based on the interpretation. Efficient, accurate, and precise communication without fear of reprisal is a goal of the fetal monitoring review format. Effective communication between physicians and nurses is vital to patient safety.[32,33] Team members (providers and nurses) should ensure that the information sent was received and an opportunity for plan of care clarification exists.[34] The Culture of Safety program reiterated the fetal monitoring categories, accountability for team response, and communication of the plan of care.

Protocol 4: Operative vaginal delivery

This section of the program was always presented by a physician because of content authority. *Operative vaginal delivery* refers to a forceps or vacuum-assisted delivery. Whether or not OVD is appropriate for the woman is a complex decision, considering both maternal and fetal well-being.[35] The OVD requires a careful assessment of the clinical situation, clear communication, and readiness of the delivery team. Indications, contraindications, considerations of OVD prior to application, application techniques, safety concerns, and a time-out requirement were reiterated as part of the protocol during the session. The time-out includes a verbal announcement of 5 key assessment parameters prior to the application of forceps or the vacuum. The acronym SPACE was created to recall all components: **S**tation, **P**osition, **A**nesthesia adequacy and personnel availability, **C**linical indication, and **E**stimated fetal weight. This acronym is detailed in Figure 5. This assessment is rapid and recorded in the electronic medical record by the nurse prior to the delivery, using information voiced by the physician. Following the delivery, the physician enters details to complete the medical record including instrument used; if forceps used, any rotation required and the number of pulls; or if vacuum used, the number of pop-offs, if any. Perineal trauma, lacerations, and any apparent neonatal effect are also noted. Utilization of the OVD time-out procedure was formalized and introduced to the healthcare team just prior to the initiation of this culture of safety session. Compliance to the OVD time-out has been monitored by the quality and safety committee, and the results are communicated during the session.

EVALUATION

At the conclusion of each session, participants were asked to evaluate the session. Both providers and nurses found the session extremely valuable, especially learning together in their own environment. All attending obstetrician physicians, nurse midwives, residents,



Rm	2:00 EFM	2:00 Provider Aware	4:00 EFM	4:00 Provider Aware	6:00 EFM	6:00 Provider Aware	8:00 EFM	8:00 Provider Aware	10:00 EFM	10:00 Provider Aware	12:00 EFM	12:00 Provider Aware	14:00 EFM	14:00 Provider Aware	16:00 EFM	16:00 Provider Aware	18:00 EFM	18:00 Provider Aware	20:00 EFM	20:00 Provider Aware	22:00 EFM	22:00 Provider Aware	24:00 EFM	24:00 Provi
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EFM Key:

Enter (1) if category I FHR interpretation **Category I FHR Tracing (Normal)** Include all of the following: a) Baseline rate: 110-160 BPM b) Moderate baseline variability c) Early decelerations: present or absent d) Accelerations: present or absent e) Late or variable decelerations: absent **Management Category I FHR Tracing:** *No specific action is required*	Enter (2) if category II FHR interpretation **Category II FHR Tracing (Indeterminate)** Include all FHR tracings not categorized as Category I or Category III **Management Category II FHR Tracing:** Requires bedside evaluation by the attending physician/CNM or resident *Place a ✓in the column under* ***Provider aware*** *if aware of tracing.*	Enter (3) if category III FHR interpretation **Category III FHR Tracing (Abnormal)** Include either a or b: a) Absent baseline FHR variability **and** any of the following: 1) Recurrent late decelerations 2) Recurrent variable decelerations 3) Bradycardia b) Sinusoidal pattern **Management Category III FHR Tracing:** Requires bedside evaluation by the attending physician and escalation to the unit attending for notification of the tracing if attending physician not available or disagreement

Figure 4. Escalation of the fetal monitoring surveillance tool completed by a senior RN every 2 hours. This form contains only a sample of the rooms. In total, 32 birthing rooms are in this labor and delivery unit, and each electronic fetal monitoring strip is reviewed every 2 hours by an RN in addition to the required review depending upon the maternal status. FHR indicates fetal heart rate; BPM, beats per minute; CNM, certified nurse midwife; DOB, date of birth; CBC, complete blood count; DIC, disseminated intravascular coagulation; PRBC, packed red blood cells; OR, operating room. From Hospital Policy 12.0052

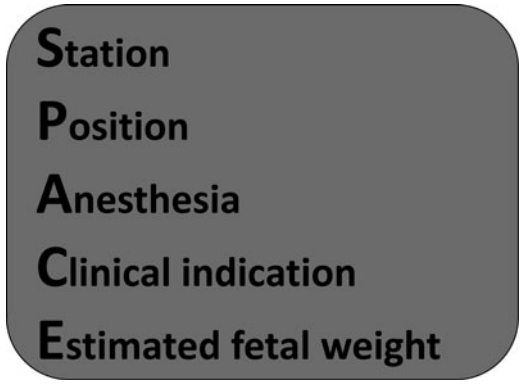

Figure 5. Operative vaginal delivery—acronym for "time-out" procedure: SPACE.

anesthesiologists, and nursing staff attended the 2-hour presentation. Evaluations were received from each participant, and 97% rated the overall program as excellent and useful. Written comments included the following: "Glad we got to do it as a multidisciplinary team"; "I feel it is helpful to put MD's and nurses in the same education classes together to know we are all hearing the same thing"; and "It's very helpful to practice stressful situations in a controlled/calm setting."

Teams must have plans to sustain learning and proficiency through ongoing training, repetition, and competency reviews. Learning in a multidisciplinary setting is beneficial and has become incorporated into the culture of teamwork and communication. In addition, the in situ simulation offered the unique ability to probe the complexities of clinical and interpersonal dynamics simultaneously. The real-life scenarios of clinical conditions that are rare, but reasonably likely to occur, offered the opportunity to evaluate ad hoc team performance. The debriefing session encouraged reflection drawn from the prior and present experiences, which led to a shared mental model. Both experienced and inexperienced clinicians embraced the in situ training experience.

OUTCOMES

One of the most effective ways to improve a safety culture and prevent adverse outcomes is to optimize safety-related communication throughout an organization. The Agency for Healthcare Research and Quality recommends yearly measurement of safety culture as one of its 10 patient safety tips for hospitals.[1] Prior to the "Maintaining a Culture of Safety" educational session, a safety questionnaire was distributed to all physicians, residents, mid-level providers, and RNs throughout the hospital in April 2010.[36] Obstetric healthcare staff (MD, certified nurse midwife, and RN) responded to the questionnaire. Fifty-five percent of the labor and delivery respondents selected "excellent" or "very good" as an answer to the statement: "Give your unit an overall grade on patient safety." In comparison, the same questionnaire was distributed in November 2011, near the end of the educational session, and 78% scored their response to the same statement as "excellent" or "very good."[37] Figure 6 displays this significant increase ($P = .003$) from 2010 to 2011. This significant rise is a

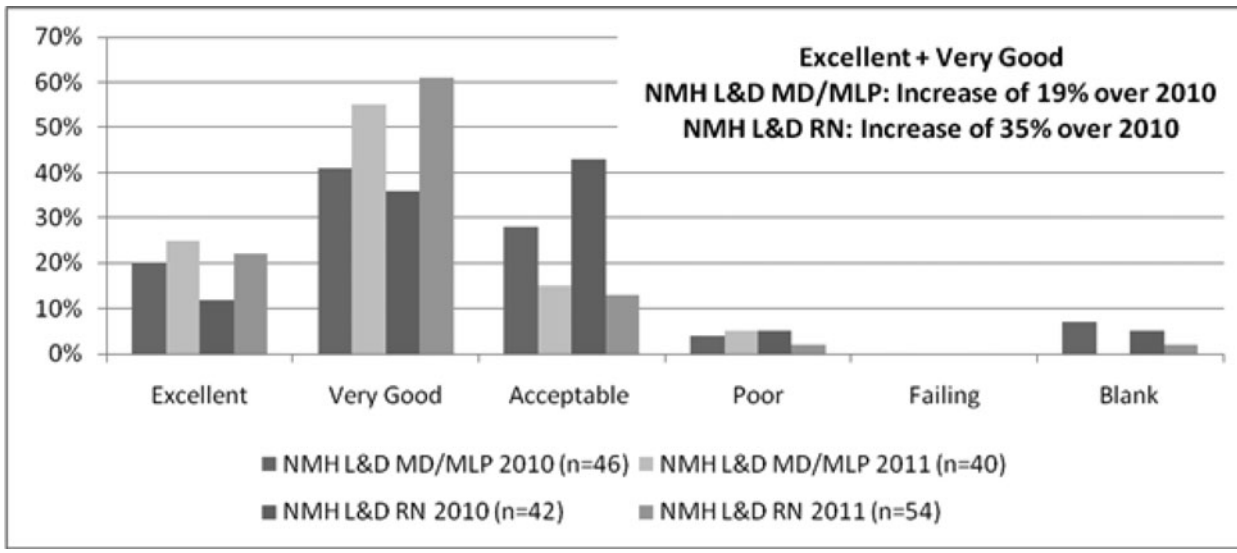

Figure 6. Result from the Agency for Healthcare Research and Quality survey. Response to safety survey question: "Give your unit an overall grade on patient safety." NMH indicates Northwestern Memorial Hospital; L&D, labor and delivery; MLP, mid-level provider. From Agency for Healthcare Research and Quality.[36,37]

reflection of the growing expectation and presence of teamwork and communication within the labor and delivery unit.

SUMMARY

This educational program, designed by a multidisciplinary team, provided an opportunity for more than 370 professionals to engage in discussion and perform simulation with the goal to improve team communication and performance. The program, "Maintaining the Culture of Safety," reiterated to all team members the high-risk nature of the normal activities within a large labor and delivery unit and an organizational determination to achieve consistently safe operations within an intrinsically complex setting. Through discussion and simulation, collaboration across ranks and disciplines was heightened and discrepancies within the protocols were clarified in a blame-free environment. While certain errors demand accountability addressed through peer review, this program focused on systems issues versus reckless behavior such as refusing or ignoring a "time-out" prior to OVD. While protocols help guide practice, it is acceptable for a clinician to use an alternative effective approach in a specific situation, given explanation recorded in the patient record.[38] This program provided an opportunity to focus on accurate and timely communication, flexible and adaptive protocol utilization, and cohesive and reliable team cooperation, all of which contributes to a culture of safety within the labor and delivery unit.

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