Organization: Johns Hopkins Bayview Medical Center  
Solution Title: Closing Obstetrical Safety Gaps; One In-situ Drill at a Time

Program/Project Description: What was the problem to be solved? How was it identified? What baseline data existed? What were the goals—how would you know if you were successful?

The use of simulation in the healthcare setting has gained momentum as an integrative way to enhance clinical performance and promote teamwork. Although a comprehensive simulation program based out of a high-tech simulation center existed in our organization, the ability to use simulation to identify safety gaps in the actual clinical setting was lacking.

Occurrence reporting was the primary source of information which identified safety gaps in our obstetrical clinical setting. These occurrence reports were initiated by staff after they experienced system breakdowns or identified the potential for error to occur while caring for patients. The goal of our project was to implement an in-situ drill program in order to identify and correct unknown deficiencies before a patient was harmed. Success of this project was evaluated based on the ability to identify and rectify safety gaps that did not involve real patients in the actual obstetrical setting.

Process: What methodology or process was used to develop the Solution?

In-situ drill programs differ from traditional simulation programs whereby the drill is conducted in the actual clinical setting rather than an artificial simulation lab. The clinical environment within which clinicians care for patients possesses numerous factors that cannot be reproduced in the simulation lab. Hence, the OB Patient Safety Nurse and the obstetrical leadership committee collaborated to explore ways to use drills and simulations to expose safety gaps within the environment of the obstetrical units. The team supported the development of an in-situ drill program which provides opportunities for the interdisciplinary team to practice and evaluate their response to obstetrical emergencies.

Solution: What Solution was developed? How was it implemented?

The team explored the potential for an in-situ drill program by first identifying high risk clinical scenarios that were thought to yield opportunities for system improvements. The team developed drill objectives for each scenario, composed a list of necessary supplies and formulated a team that could assist with implementing each scenario. These high-risk, low frequency obstetrical emergency scenarios were brought together to form an obstetrical in-situ drill program.

The in-situ drill program was introduced to the nursing and provider staff in January 2010. Since the introduction of the program, 22 drills have been conducted and involved 68 nursing and provider staff. The drills included scenarios such as eclampsia, shoulder dystocia, preterm delivery of an infant on the antepartum unit, emergency cesarean section outside of Labor & Delivery, infant abduction, and malignant hyperthermia. A facilitator was designated to observe and record the team interactions during each drill. The drills were videotaped and lasted approximately 15 minutes each, followed by a 30 minute debriefing session. The debriefing session was thought to be the most valuable part of the drill process. During the debriefing, the teams were able to evaluate their own performance and discuss system issues that may have impaired an optimal outcome. In addition to discussion
among team members, the facilitator was able to provide discussion points for the team based on their observation of the drill.

The supplies that were used for the drills were retained and re-used in subsequent drills to limit the financial burden of repeatedly replacing supplies. At the conclusion of every drill, the staff also evaluated how the drill process was implemented. Feedback from the evaluations was used to improve the process for subsequent drills.

**Measurable Outcomes:** What are the results of implementing the Solution? Provide qualitative and/or quantitative results to data. (Please include graphs, charts, or tools as attachments.)

Through the implementation of the in-situ drill program, numerous safety gaps were identified. An eclampsia drill revealed that calcium gluconate (the treatment for magnesium sulfate toxicity) had been removed from the labor & delivery pyxis by pharmacy without staff knowledge. The team also recognized that we did not have the appropriate size needle to administer IM Magnesium sulfate during eclamptic emergency.

A shoulder dystocia drill revealed that there was not an accurate method for evaluating the duration of the shoulder dystocia. In addition, the team recognized that consistency of documentation of the dystocia across disciplines was jeopardized secondary to communication barriers between obstetrical and neonatal teams.

A preterm delivery drill on the antepartum unit revealed that the emergency delivery kit was missing necessary delivery equipment. An ambo bag needed for newborn resuscitation was not immediately available and the medication pyxis did not contain all medications that were necessary for the treatment of postpartum hemorrhage.

An emergency cesarean section drill revealed that emergency elevator keys were not readily available for the neonatal team to rapidly respond to the emergent delivery and that all team members did not have a clear understanding of the contingency plan for emergent cesarean deliveries that must take place in the general operating room when both operating rooms in the Labor and Delivery unit were already in use.

The in-situ drill program enabled these safety gaps to be rectified before a poor patient outcome could occur. Although it is difficult to link these improvements to future clinical outcomes, we can predict that by identifying and improving these safety gaps we will ultimately provide safer care to our patients.

**Sustainability:** What measures are being taken to ensure that results can be sustained and spread?

Sustainability of the in-situ drill program over the 18 months was achieved through consistency and transparency. The drills were announced and performed on a regular basis to increase acceptance by staff. With each drill, the staff's enthusiasm and desire to participate increased. Each safety gap that was identified during an in-situ drill was presented to the OB leadership committee on a biweekly basis to strategize correction of the gap identified. Once corrected, the gap and correction was communicated to the entire multidisciplinary team so that the learning points and system improvements were appreciated throughout the department. The transparency of lessons learned during the in-situ drill process enabled the team to fully appreciate the opportunities that existed that could decrease potential bad outcomes and support a culture of safety within a diverse group of staff who are empowered to identify and reduce safety risks on their own.

Despite the numerous benefits of in-situ drills, conducting drills in the actual clinical setting concurrently while providing patient care does present some limitations. High unit census necessitating drill cancellation, as well as patient perception, are two significant limitations. A few strategies were put in place in order to address these limitations. Twenty percent of planned drills needed to be cancelled due to census or patient acuity on the units, therefore, the number of drills planned were greater than needed in order to compensate for those which were cancelled. In addition, immediately prior to conducting a drill, the patients and their families were notified that
the team would be participating in a safety drill. By informing the patient and their families of the planned drill, we found that they experienced decreased anxiety or fear about what they may have heard or seen during the drill. The feedback received from patients and their families has been positive and they have expressed appreciation of this safety strategy.

**Role of Collaboration and Leadership:** What role did teamwork and collaboration play in the Solution? What partners and participants were involved? Was the organization's leadership engaged and did they share the vision for success? How was leadership support demonstrated?

The role of the OB Safety Nurse is critical to the initiation of creative strategies which address patient safety through staff involvement and implementing improvements. As a change agent, the OB Safety Nurse has the time and expertise to develop these strategies. However, implementing and sustaining an in-situ drill program requires the collaboration and commitment of nursing and provider leadership, as well as the entire interdisciplinary team. The drill planning group composed of nurses and providers who helped to organize and facilitate the drills was dedicated to making the program successful. Support from OB department leadership was essential to reinforce the importance of the drills. The department chairman, the director of Labor & Delivery, and nursing leadership were completely engaged in the process and shared the vision for success with the rest of the team. Department leadership also supported the in-situ drill program by offering storage space for simulation equipment and supplies, supplying a video camera for recording the drills, and compensating staff for their time spent planning and facilitating the drills.

**Innovation:** What makes this Solution innovative? What are its unique attributes?

This program was a grassroots effort which included the clinical and leadership staff. Because of staff involvement and ability to recognize its positive impact on patient safety, they supported the program. Currently the obstetrical department is the only department in the hospital with a comprehensive in-situ drill program. The program's successes and challenges have been presented at the hospital's Quality and Patient Safety Council where we encouraged other departments to develop similar programs.

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